National Implementation Plan

Uruguay

Stockholm Convention on Persistent Organic Pollutants

Government of Uruguay

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The Ministry of Housing, Use of the Land and Environment, through its National Directorate for the Environment, coordinated the formulation of the "National Implementation Plan for the Stockholm Convention" Project. In order to facilitate follow-up and interaction with other institutions, a National Coordinating Committee was appointed.

National Coordinating Committee - Member Institutions

Ministry of Housing, Use of the Land and Environment

Ministry of Foreign Affairs

Ministry of Livestock, Agriculture and Fisheries

Ministry of Public Health

Ministry of Economy and Finance

Ministry of Labour and Social Security

Agro-Chemical Products Chamber

Chamber of Industries of Uruguay

University of the Republic

Uruguayan Network of Environmental NGOs

National Non-Governmental Organizations Association

Other Institutions Involved

ANCAP - National Fuels, Alcohol and Cement Administration

ANEP - National Public Education Board

ANP - National Port Authority

UTE - Electrical Power Utility

BSE - State Insurance Bank

Uruguayan Confederation of Cooperative Entities

Secondary Education Board

CUA - Associated Consumers and Users

Local Governments

Ministry of Defence - National Coastguard Authority

Ministry of Interior - National Fire Brigade

LATU - Technological Laboratory of Uruguay

PIT-CNT - Workers Trade Unions Federation

Port of Montevideo Coastguard Authority

Irregular Settlements Integration Programme

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PREFACE

The "National Implementation Plan for the Stockholm Convention in Uruguay" represents a decisive step towards fulfilling the commitments taken up by our country in the framework of the Stockholm Convention on Persistent Organic Pollutants, an international instrument whose main objective is to protect the environment and public health against the presence of these hazardous chemical substances.

This Convention was signed by Uruguay in May 2001 and ratified by Law 17.732, on December 31, 2003. It came into force on May 17, 2004 and at the time of publication of this document, 124 countries have already become Parties to this international instrument. Persistent organic pollutants are chemical substances that persist, that bio-accumulate in living organisms and convey the risk of adverse effects on human health and the environment. Evidence of their being carried over long distances to regions where they have never been used or produced before, led the international community to engage in an urgent global endeavour to reduce and eliminate their release into the environment.

With a strong commitment and presence in national and international meetings of the Chemicals Bloc, our country initiated a process to formulate its own National Plan in September 2003. This document completes and consolidates this process. This Plan presents the actions agreed on at the national level to manage persistent organic pollutants in the framework of managing chemical substances during their life cycle and in the framework of national environmental policies.

Throughout the formulation process, national capacity was reinforced as we learnt about the reality of the country in this field, issues were identified and solved and new inter-institutional coordination processes were initiated, involving different sectors of our society. The Plan reflects decision making, national capacity building, work planning and commitments taken up by different institutions, all key elements for implementation.

The "National Implementation Plan for the Stockholm Convention" is a document that sets forth the activities that need be undertaken in conformity with the Convention; its nature being dynamic and its application flexible. It is within this framework that our country is conducting its periodical review and updating on the basis of national requirements and priorities, and also following new decisions stemming from the Conference of the Parties. The Ministry of Housing, Use of the Land and Environment hereby reaffirms its commitment to convene and work in coordination and support with all the stakeholders and partners required for this implementation. It is also committed to future reviews and modifications to this document, in response to changes in terms of national circumstances and/or resources necessary to conduct activities included in the Plan.

Montevideo, May 17, 2006

Architect Mariano Arana
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EXECUTIVE SUMMARY

On December 31, 2003, Uruguay ratified the Stockholm Convention through Law Nº 17.732. The Convention came into force on May 17, 2004 and it is a legally binding international instrument for the application of measures directed to the prevention of health and environmental hazards caused by Persistent Organic Pollutants (POPs). At the time of publication of this document, 151 governments have signed the Convention and 124 countries are Parties to it.

The POPs are a group of chemical substances that when combined present the characteristics of toxicity, persistence, bio-accumulation and capacity to travel long distances from the point they were released or used. These properties make the presence of POPs a global threat. Initially, the Convention agreed to work on 12 priority substances (pesticides, substances generated unintentionally and chemical products used in industry). The specific objectives of the Convention include the elimination or restriction of the production, use, import and export, reduction of unintentional emissions, elimination of stockpiles and promotion of best technologies available as well as best environmental practices. Likewise, it has the peculiarity of committing the Parties to prepare a formal National Implementation Plan (NIP) relative to the Convention.

In order to meet these objectives, the Ministry of Housing, Use of the Land and Environment coordinated the execution of the Project to formulate a Plan, together with the United Nations Environmental Programme (UNEP) as implementing agency, with the economic support of the Global Environment Facility (GEF) and with the participation of the United Nations Development Programme (UNDP), as administrator of these funds.

The Project was executed in a period of two and a half years. Over this period, different studies and activities were conducted for the elaboration of the Plan and, in parallel, implementation steps were taken to consolidate and ensure the continuity of the national strengthening process in POP management.

A large number of both private and public organizations participated and contributed their knowledge and viewpoints, helping consolidate inter-institutional, inter-sectoral and inter-disciplinary approaches needed to facilitate coordination and integration processes for activities to be carried out by State agencies, the private sector and the civil society. In addition, a series of workshops were held; their objective was to disseminate the execution of this Project and generate opportunities for consultation with different public and private organizations.

Taking the different thematic areas of the Convention into account, the Project was organized around the following six programmes: Management of Chemical Substances, Environmentally Sound Management of Pesticides, Unintentional Emissions, Prevention and Management of Contaminated Sites, Elimination of PCB (polychlorinated biphenyls) stockpiles, and Sensitisation, Training and participation of citizens.

In order to conduct basic studies, existing national background information and data on the thematic areas were used, while a compilation and information updating methodology--specially designed to fit each programme-- was being developed and applied. Within this framework the inventory on Dioxins and Furans was updated, a diagnosis on the situation of managing transformers and other electrical equipment potentially PCB-contaminated, the first inventory of potentially POP-contaminated sites and other priority substances was developed, obsolete pesticide stockpiles were inventoried, and institutional capacity was assessed, including the analytical capacity relative to POP monitoring and evaluation in environmental matrices.

Using the life- cycle approach, different aspects relative to the management of POPs and other substances were studied. Basic gaps were identified in terms of classification and labelling of hazardous substances and the definition of responsibilities of those in charge of commercial activities. A need was detected for an in-depth

study of the specific technical and regulatory aspects related to storage of hazardous substances, and to reinforce measures governing substance-related trans-border operations. The need to create a Hazardous Substances List and improve information management relative to operations with such substances, were also identified. Uruguay is already in the process of designing a National Information System on Chemical Substances, with the support of UNDP as implementing partner, through a GEF funded project.

A list integrated by 167 substances defined as priority substances has been generated; it includes the 12 POPs and other high-relevance substances both at the national and international levels. A 63% of these substances are pesticides used in agriculture, animal husbandry, households and industry; the importance of studying this set of substances in particular was also stressed.

In terms of POP pesticides, the largest inflows into Uruguay were registered between 1978 and 1983. This information is limited as it is currently impossible to access data prior to 1969 and this only refers to pesticides used in agriculture. Toxaphene and hexachlorobenzene were never registered for agricultural use. In 2005 a decree was passed banning the introduction, production and use of POP pesticides in any form or under any scheme in Uruguay, and this became the first regulation to cover the whole life cycle of substances. Accordingly, Uruguay does not present exemptions to Article 4 of the Stockholm Convention.

Nevertheless, promotion of an adequate management of pesticides is identified as a priority. To this end, it becomes essential to adapt and develop regulations that integrate environmental and human health protection components, as well as foster sensitisation and training of all actors involved in the life-cycle stages, particularly in the case of pesticide users. It is necessary to strengthen and develop integrated programmes to monitor the presence of pesticides in the environment, in food and in the population (especially in the case of workers), to detect critical situations and contribute information for management-related decision making. Likewise, it is necessary to conduct research and promote environmentally sound production as well as management plans for waste generated in the productive sector, for example, disposable pesticide containers.

The Project took stock of obsolete pesticides totalling 20 tons, mostly located in public institutions (among them, 8 tons of gamma-HCH and 400 litres of DDT), though there may be other stockpiles not duly declared. Therefore, it is necessary to promote measures and specific regulations to prevent the generation of new stock given the deficiencies in the quality control of raw materials and mistakes in production planning by pesticide importers or manufacturers.

The unintentional emissions in the country were estimated on the basis of the Standardized Toolkit prepared by UNEP-Chemicals. The concern and knowledge on these pollutants is at an inception stage in our country, though the society is quite sensitive given the undertakings identified as potential sources of dioxin and furan emissions. In order to place the issue in the right context, information is required in terms of pollutant levels in emissions of the industrial sector, in environmental matrices and food, to which purpose the country does not have installed capacity at present. Regarding the reduction of emissions, a series of measures could be adopted without incurring into excessive costs; they could be implemented before the best technologies become available (the latter would undoubtedly involve considerable costs for the productive sector). The priority is to improve industrial processes by applying good practices and direct efforts to a sound management of solid waste in general (this has been identified as the number one environmental priority in our country).

Throughout the Project development process, 353 potentially contaminated sites were identified; they include a significant number of areas potentially contaminated by POPs. After the identification of contaminated sites, an appropriate framework must be developed to ensure an environmentally sound management. This involves the formulation of specific regulations and institutional capacity

building (including among others, the creation of infrastructure, training of government technical experts and analytical capacity building). In addition, it is necessary to promote research and development of management alternatives that respond to the national socio-economic context. In order to avoid inappropriate use of the sites, it is essential to focus on the sensitisation of key sectors. The promotion of an adequate waste management --mainly in the case of industry-generated waste-- and the implementation of better environmental practices, have been identified as crucial to prevent the generation of new contaminated sites.

In terms of PCB-polluted equipment, it must be pointed out that the national power utility that generates, transmits and distributes electricity and is owner of 95% of transformers being used in the country, includes a dielectric oil management system which allows for the identification and adequate handling of PCB stocks. However, the possibilities for cross-contamination during maintenance operations, the lack of national infrastructure to treat and eliminate stockpiles, plus the existing difficulties to inventory the total PCB stocks (specially in terms of other equipment containing dielectric oil) are the main weaknesses identified in compliance with this aspect of the Convention. Therefore, this is how the process to formulate the capacity building project on environmentally sound PCB management in Uruguay was started, financed by GEF funds and with the support of UNDP as implementing partner.

In terms of sensitisation and training, the country has engaged in sustained environmental education efforts by means of different projects and activities carried out by the State as well as by civil society organizations. The non-governmental organizations (NGOs) operating in Uruguay, can be grouped into two main categories according to their working and thematic areas: those involved in the social and/or economic areas that incorporate the environmental issues indirectly, and those whose core activity area is specifically environmental.

In the course of the Project, an initial communications, sensitisation and training strategy phase was started with the help of seminars where information needs were identified vis-à-vis POPs from the perspective of the formal education system and that of civil society organizations. In reply to these needs the proposal is to sensitise, inform and build on the social capacity, in particular the most vulnerable sectors, on the risks associated to the use of chemical substances and products, leading to their responsible use and reduction of related risks. These activities must be integrated to the training components identified in other areas of the Plan. Likewise, a proposal is made to devise programmes and strengthen civil society organizations to generate a framework that favours the participation of citizens.

Access to information on POP-related scientific work and documents generated in the country is rather complex given that this information is not systematized. Therefore, to design and implement a system that incorporates and updates the academic information and research generated at the national level on chemical pollutants, becomes a priority, in addition to providing research lines relative to all the gaps detected by the Project.

In the framework of action lines identified as priorities, programmes were elaborated as part of the Plan. The Project team estimated the necessary resources by budgeting the activities that are included in the programmes (short-term activities: for the period covering 2006-2010; and medium-term activities: 2011-2015), also identifying the type of funding source.

The activities incorporated in the programmes can be grouped as follows:

- Institutional capacity building.
- Development of sectoral regulations identified in each of the programmes.
- Development of research lines.
- Sensitisation, training and participation of citizens.

- Risk prevention relative to workers' health.
- Food security.
- Improvement of waste management to minimize unintentional emissions and the generation of obsolete pesticide stockpiles and contaminated sites.
- Specific action included in programmes such as Improvement of Chemical Substances Management, Environmentally Sound Pesticide Management and Elimination of PCB Stockpiles and Prevention, and Management of Contaminated Sites that do not integrate the previously described areas.
- Improved environmental performance through the implementation of better environmental practices and better technologies available.
- Monitoring of industrial sector and environmental monitoring plan for unintentional emissions and pesticides.

The cost estimated for the implementation of these activities in the first ten years is of around 58 million US dollars, 66% of which is focused on the first five years.

It must be highlighted that the estimation of this budget does not include all the activities that involve field intervention, as each of them requires a special analysis and the information currently available is not enough in terms of scope of actions and the corresponding budget. For example, actions involving modification or restructuring at the level of productive sectors, or complete treatment of all stocks of PCB-polluted waste or processes to remedy contaminated sites, are all included in this category.

The Plan contained in this document represents Uruguay's commitment vis-à-vis the international chemicals Agenda, within the framework of sustainable development policies of the country. It represents a strategic planning tool to implement actions relative to persistent pollutants by integrating national objectives and obligations arising from the Convention.

It is a public document that will provide transparency to all activities that are planned and carried out. Likewise, it conceives the methodology and mechanism to follow-up and reformulate the Plan, adapt it to changes and to evaluate the efficacy of measures proposed.

1 Introduction

1. INTRODUCTION

Over time, chemicals have gained territory in contemporary society. In Uruguay in particular, the use of chemicals and pesticides in industry and agriculture grew substantially in the 60s and 70s. Among them, a group of chemicals known as persistent organic pollutants (POPs) gained international attention because of scientific evidence which established a link between exposure to very low doses of this type of pollutant and endocrine disorders, reproductive and immune dysfunctions, alterations in growth, in the nervous system, and the appearance of several types of cancer.

Persistent Organic Pollutants (POPs) are organic compounds that are resistant to the natural processes of photolytic, physical, chemical and biological degradation. They have a low solubility in water and a high solubility in lipids, which gives them the ability to bioaccumulate in the fatty tissues of living organisms. Furthermore, some POPs are semi-volatile, which added to their high persistence in the environment, allows them long-range travel in the atmosphere; to a lesser degree, they are also transported in river and ocean waters. Thus, though the use of POPs may be geographically local, the possibility of long-range travel makes this a global problem, given that the whole world's population and biota are exposed to POPs.

The food chain plays a very important role in the exposure to POPs, because relatively low levels of POPs in the environment can lead to detectable levels in humans and the biota in general through their accumulation and biomagnification.

Human beings may be exposed to POPs through food, work accidents and the environment. Exposure, both chronic and acute, may be associated with a wide range of health hazards, including death.

Several episodes of food poisoning, severe work exposure, as well as research have made it possible to determine some of the acute toxic effects of these compounds. It is harder to scientifically prove the existence of a link between harmful effects in human health and chronic exposure at sub-lethal concentrations.

Developing foetuses and unborn children are particularly vulnerable to exposure to these pollutants by transfer from the mother through the placenta and breast milk at key stages of development. Recent studies have determined that some POPs are responsible for
a reduction in immunity in infants and small children, generating serious consequences for their health.

Consumption of POPs such as polychlorinated biphenyls (PCB), dioxins or furans with food may be related to an important reduction in the population of natural killer cells (lymphocytes).

The toxic effects which some of these pollutants have on the environment, including human health, added to the already-mentioned properties of high persistence and global distribution have driven the international community to seek an urgent response in order to reduce and eliminate their release into the environment. This process of international response began in March 1995, when the UNEP Governing Council adopted decision 18/32 inviting the Inter-Organization Programme for the Sound Management of Chemicals (IOMC), and the Intergovernmental Forum on Chemicals Safety (IFCS) to begin the evaluation process of a list of 12 POPs. In response, the IFCS called for a Special Task Force on POPs which developed a plan to evaluate the information available on chemical composition, sources, toxicity, environmental transport and the socioeconomic impact of those 12 POPs.

In June 1996, the Special Task Force called for a meeting of experts and concluded that there was enough information to prove the need for international action that sought to minimize the risks of those 12 POPs and the pressing need for an internationally legally binding instrument. Later, in February 1997, the UNEP Governing Council adopted decision 19/13, endorsing the

conclusions and recommendations of the IFCS. It also requested that the UNEP, together with other relevant international organizations, meet at an Intergovernmental Negotiating Committee (INC) with the mandate to develop, by the end of 2000, an internationally legally binding instrument, beginning with the list of 12 POPs.

Negotiations for the Convention began in June 1998 in Montreal, Canada and ended in December, 2000 in Johannesburg, South Africa. The Conference of Plenipotentiaries was called for May 22 and 23, 2001, in Stockholm, Sweden.

The Stockholm Convention is an internationally legally binding instrument for the application of measures to prevent health and environment hazards caused by POPs. It entered into force on May 17, 2004. At the time of the publication of this document, 151 governments signed the Convention and 124 countries are Parties of it.

The Convention initially agreed to work on a set of 12 priority products, all of them organochlorinated compounds, 9 of which are pesticides, 2 refer to unintentional emissions and one is a product used in industry.

Table 1 - Compounds included in the Stockholm Convention.

Compound	Use / Source	Annex to the Convention
Aldrin	Pesticides	A
Chlordane		
Dieldrin		
Endrin		
Heptachlor		
Mirex		
Toxaphene		
DDT		B
Hexachlorobenzene (HCB)	Pesticide, Industrial use chemical, Unintentional release	A, C
Polychlorinated biphenyls (PCB)	Industrial use chemical, Unintentional release	A, C
Dioxins	Unintentional release	C
Furans		

Under unintentional production compounds it includes dioxins, furans, polychlorinated biphenyls and hexachlorobenzene. The latter two, in addition to having been synthesized, are unintentionally produced through the same processes as dioxins and furans. These include thermal processes involving organic matter and chlorine, controlled and uncontrolled combustion processes and some chemical reactions.

The countries that have signed the Convention agree to fulfil the provisions set forth in it, with the purpose of protecting human health and the environment from persistent organic pollutants. Within their first obligations, the Parties agree to develop action plans to reduce emissions and/or eliminate POPs.

In our country, the Convention was approved on December 31, 2003 by Law No. 17732 and it entered into force for Uruguay on May 17, 2004.

The central aspects of the Stockholm Convention lie within the following areas:

- Eliminate or restrict the production, use, import and export of POPs derived from intentional production and use.
- Reduce releases from unintentional POP production.
- Promote the use of the best available technologies and sound environmental practices in order to reduce POP emissions.
- Eliminate, in an environmentally sound manner, stockpiles of POPs that are

obsolete, deteriorated, past their due date or forbidden, as well as their waste.

It is worth noting the framework in which specific aspects are developed, highlighting the following:

- The need to take measures on POPs that have a global scope.
- Support among the different international agreements on trade and environment, and particularly the synergy between international Conventions of the chemicals bloc (Basel – Rotterdam – Stockholm).
- Caution and prevention being the basic principles of policies developed.
- The need to cooperate with developing countries and countries with economies in transition.
- The need to take measures to prevent adverse effects caused by POPs at all stages of their life cycle.
- That POP manufacturers take responsibility for reducing the harmful effects of these products.
- Encouraging Parties not having regulatory and assessment schemes for pesticides and industrial chemicals to develop such schemes.

Despite the fact that the Stockholm Convention has determined an initial list of twelve compounds or groups of compounds, criteria are established for the inclusion of new POPs to the initial list. In order to do this, a subsidiary organ exists, the POP Review Committee, for the purpose of analysing new additions to the original list in annexes A, B or C in the convention. To this date, the following products have been proposed to include the list:

Table 2 – Compounds which are candidates to enter the Stockholm Convention

Compound	**Use / Source**
Chlordecone	Pesticide,
Lindane	Pesticide
Pentabromodiphenyl ether	Industrial chemical product
Hexabromodiphenyl	Industrial chemical product
Perfluorooctanyl sulfonate	Industrial chemical product

These proposals have been evaluated according to Article 8 of the Convention and have gone through the first stage fulfilling the selection criteria specified in Annex D "Information Requirements and Selection Criteria". Their risk profile was written and they will continue to be evaluated at the Committee's second meeting.

Table 3 features the main obligations arising from the Convention according to the national reality.

Table 3 – Some aspects of the commitments undertaken by Parties to the Stockholm Convention

Production and intentional use
Each Party shall: Ban and/or take the legal and administrative measures necessary to eliminate the production, use, import and export of the chemicals included in Annex A. It shall restrict production and use of the chemicals included in Annex B (DDT at present).
Each Party shall take measures to ensure that: A chemical included in Annexes A or B is imported only for the purpose of environmentally sound disposal or for a purpose or use allowed for that Party.
A Chemical included in Annex A, for which any specific exemption for production or use is in effect, or a chemical included in the Annex B list, for which a specific exemption for production or use for an acceptable purpose is in effect, taking into account the provisions in existing international prior informed consent instruments, is exported only: I) For the purpose of environmentally sound disposal. II) To a Party which is permitted to use that chemical. III) To a State not Party to this Convention, which has provided an annual certification to the exporting Party.
Each Party that has one or more regulatory and assessment schemes for new pesticides or new industrial chemicals shall take measures to regulate, with the aim of preventing the production and use of new pesticides or new industrial chemicals which exhibit the characteristics of persistent organic pollutants.
Any Party that has a specific exemption in accordance with Annex A, or an acceptable purpose in accordance with Annex B shall take the appropriate measures to ensure that any production or use under such exemption or purpose is carried out in a manner that prevents or minimizes human exposure and release into the environment. For exempted uses or acceptable purposes that involve intentional release into the environment under conditions of normal use, such release shall be to the minimum extent necessary, taking into account the applicable standards and guidelines.
Specifically for Polychlorinated biphenyls (PCB)
Each Party shall: With regard to the elimination of the use of polychlorinated biphenyls in equipment (e.g. transformers, capacitors or other receptacles containing liquid stocks) adopt, by 2025 at the latest, measures in accordance to the following priorities: I) Make determined efforts to identify, label and remove from use all equipment containing more than 10 % polychlorinated biphenyls and volumes greater than 5 litres; II) Make determined efforts to identify, label and remove from use all equipment containing greater than 0.05% polychlorinated biphenyls and volumes greater than 5 litres; III) Endeavour to identify and remove from use all equipment containing greater than 0,005% polychlorinated biphenyls and volumes greater than 0,05 litres; Promote the following measures to reduce exposure and risk in order to control the use of polychlorinated biphenyls; I) Use only in intact and non-leaking equipment and only in areas where the risk from environmental release can be minimised and the area may be quickly decontaminated; II) Not use in equipment in areas where food or feed is produced or processed for humans or animals; III) When used in densely populated areas, including schools and hospitals, take all reasonable measures to protect from electrical power cuts which could result in a fire and perform regular inspections of such equipment to detect any leak; Ensure that the equipment containing polychlorinated biphenyls described in subparagraph a) shall not be exported or imported except for the purpose of environmentally sound waste management; Except for maintenance and repair operations, not allow recovery for the purpose of reuse in other equipment, of liquids with polychlorinated biphenyls content above 0,005%. Make determined efforts to achieve the environmentally sound disposal management of liquids containing polychlorinated biphenyls and of equipment contaminated with polychlorinated biphenyls with a content of polychlorinated biphenyls above 0,005%. Endeavour to identify other articles containing more than 0,005% polychlorinated biphenyls (e.g. cable-sheaths, cured caulk and painted objects) and manage them according to provisions.

Unintentional Production

Each Party shall at least take the following measures to reduce the total emissions derived from anthropogenic sources of each of the chemicals listed in Annex C, with the goal of their continuing minimization and, where feasible, ultimate elimination:

Develop, within two years of the date of entry into force of this Convention for such Party, and subsequently implement, an action plan designed to identify, characterize and address the release of the chemicals included in Annex C. The action plan shall include the following elements:

I) An evaluation of current and projected releases, including the preparation and maintenance of source inventories and release estimates.

II) An evaluation of the efficacy of the laws and policies of the Party relating to the management of such releases;

III) Strategies to meet the obligations of this paragraph, taking into account the evaluations mentioned in subparagraphs I) and II);

IV) Steps to promote education and training, and awareness of those strategies;

V) A review every five years of the strategies and of their success in meeting the obligations required.

VI) A schedule for the implementation of the action plan, including the strategies and measures identified in such plan.

Promote the application of available, feasible and practical measures that can expeditiously achieve a realistic and meaningful level of release reduction or source elimination;

Promote the development, and when it is deemed appropriate, require the use, of substitute or modified materials, products and processes to prevent the formation and release of the chemicals listed in Annex C.

Promote, and in accordance with the implementation schedule of its action plan, require the use of best available techniques for new sources, within the source categories which a Party has identified as warranting such action.

In any case, the requirement to use best available techniques for new sources in the priority categories shall be phased in gradually as soon as practicable, but no later than four years after the entry into force of the Convention for that Party. For the identified categories, Parties shall promote the use of best environmental practices.

Promote, in accordance with its action plan, the use of best available techniques and best environmental practices:

I) For existing sources, within the source categories included in Part II of Annex C and within the source categories such as those included in Part III of that Annex; and

II) For new sources, within the source categories such as those listed in Part II of Annex C which a Party has not addressed under subparagraph d).

Releases from stockpiles and wastes

In order to ensure that stockpiles consisting of chemicals included in Annex A or Annex B, or containing such chemicals, as well as wastes, including products and articles upon becoming wastes, consisting of a chemical included in Annex A, B or C or containing such a chemical or which are contaminated with it, are managed in a manner protective of human health and the environment, each Party shall:

Develop appropriate strategies for identifying:

I) Stockpiles, consisting of or containing chemicals listed either in Annex A or Annex B, and

II) Products and articles in use and wastes consisting of, containing or contaminated with a chemical listed in Annex A, B or C.

Determining, to the extent practicable, stockpiles consisting of or containing chemicals listed in either Annex A or Annex B, on the basis of the strategies referred to in subparagraph a);

Manage stockpiles, as appropriate, in a safe, efficient and environmentally sound manner. Stockpiles of chemicals included in Annex A or Annex B, after they are no longer allowed to be used according to any specific exemption specified in Annex A or any specific exemption or acceptable purpose specified in Annex B, except stockpiles which are allowed to be exported according to paragraph 2 of Article 3, shall be deemed to be waste and shall be managed in accordance with subparagraph d);

Take appropriate measures so that such wastes, including products and articles upon becoming wastes, are:

I) Handled, collected, transported and stored in an environmentally sound manner;

II) Disposed of in such a way that the persistent organic pollutant content is destroyed or irreversibly transformed so that it does not exhibit the characteristics of persistent organic pollutants. Or that it is otherwise disposed of in an environmentally sound manner when destruction or irreversible transformation does not represent the environmentally preferable option or the persistent organic pollutant content is low, taking into account international rules, standards and guidelines, including those that may be developed pursuant to paragraph 2, and relevant global and regional regimes governing the management of hazardous wastes;

III) Not permitted to be subject of disposal operations that may lead to recovery, recycling, reclamation, direct reuse or alternative uses of persistent organic pollutants; and

IV) Not transported across international boundaries without taking into account relevant international rules, standards and guidelines;

Endeavour to develop appropriate strategies for identifying sites contaminated by chemicals listed in Annex A, B or C; if remediation of those sites is undertaken it shall be performed in an environmentally sound manner.

As a management tool, the Stockholm Convention foresees that to implement its obligations, each Party shall develop a Plan, which it will transmit to the Conference of the Parties within two years of the entry into force of the Convention for such Party. This Plan will be reviewed and updated, as appropriate, on a periodic basis and in a manner to be specified by a decision of the Conference of the Parties.

It is within this framework that our country began in the year 2003 a national process to develop the Plan and is submitting this document. The project as been financed with funds from the GEF, via an agreement signed by the ministry of Housing, Use of the Land and Environment and that cooperation agency in October 2002, with UNDP acting as the fund-managing agency.

Furthermore, reports will be submitted so that Parties can transmit the measures they have taken to implement the provisions of the Convention and on the effectiveness of such measures in meeting the objectives. The periodic intervals and format of the reports is determined by the Conference of the Parties.

The following table shows the schedule for the presentation of reports, as well as for the presentation, reviewing and updating of the Plan.

Table 4 – Schedule for the presentation of reports and for the reviewing and updating of the NIP.

Reporting

	Obligation based on:	**Due date**	**Comment**
1st report	Article 15: Presentation of reports Decision 1/22: Format and schedule for presenting reports by the Parties	December 31, 2006	Format adopted by the COP-1 Decision 1/22 (Parts A and B) Format adopted by the COP-2 Decision (Part C)
Following reports	Article 15: Presentation of reports Decision 1/22: Format and schedule for presenting reports by the parties	Every 4 years	-

NIP: Presentation, reviewing and updating

Obligation based on:	**Due date**	**Comments**
Article 7: Implementation plans, Article 1, paragraphs a and b	May 17, 2006.	This document is the National Implementation Plan
Article 7: Implementation plans, article 1, paragraph c Decision 1/12: National Implementation Plans	It is not possible to predict a date due to the following differing situations: 1.When the Party identifies it as necessary on the basis of the Annex to decision 1/12 paragraphs 4 and 5[1] 2. Within two years as of the entry into force of the amendment for the Party	Process of revision and update of National Plans - Adopted by COP 2[2]

1 Factors to be taken into account for the reviewing of the NIP on the basis of Decision 1/12 paragraphs 4 and 5

1. External factors:
   a. Changes in obligations derived from amendments to the Convention or its annexes, including the addition of chemicals in annexes A, B or C;
   b. Decisions by the COP which may affect the manner in which the Parties meet the obligations undertaken under the Convention, including the approval of guidelines or provisions;
   c. Changes in the availability of technical or financial assistance;
   d. Changes in the access to infrastructure which do not depend on the Party (e.g. destruction installations)

2. Internal factors:
   a. Reports that are submitted by virtue of Article 15 of the Convention in which it is understood that the Party's Implementation Plan is not suitable;
   b. A change in national priorities;
   c. A significant change in national circumstances (e.g. in infrastructure or institutional set up) Inventories of POPs after the improvement and update, indicate a change in the magnitude of the problem to be tackled.

2 Decision as yet unnumbered at the time this document is being published.

This document is a part of the plans, programmes, strategies and actions that make up the National Implementation Plan of the Stockholm Convention, with the purpose of reducing POP-related risks to human health and the environment, within the framework of the obligations determined in the above-mentioned Convention.

The document has been structured in 6 chapters, covering the areas detailed below:

- Introduction to the Plan, including a presentation of the general context in which it has been developed.
- Framework and development processes for the Plan.
- Country reference points: Covering the basic data about Uruguay and a summary of the national situation in the subject areas covered by the Convention.
- Strategies and action plan, an integrated presentation where all the actions and programmes which are part of the Plan are shown.
- Follow up and evaluation of the Plan, submitting the mechanism proposed for the implementation, follow up and evaluation, including an initial proposal for effectiveness indicators.
- Framework for phase one projects.

2 Conceptual Framework and Plan Development Process

2.1 CONCEPTUAL FRAMEWORK AND GOVERNING GUIDELINES

The framework on which the National Implementation Plan was developed is based on the understanding that Persistent Organic Pollutants are a subset of chemicals within the universe of chemical products and substances. Therefore, despite the fact that POPs, because of their characteristics, and in particular because of the effects on health and the environment, need a stricter surveillance and control system, such a system must be developed on a broader base that covers the environmentally sound management of chemical products and substances.

The Plan has used the **life-cycle point of view** to tackle the management of chemicals. As is shown on Picture 2.1 the life cycle of a chemical consists of **"the sequence of stages from when it is "born" to when it "dies"**. According to this concept, the management of chemical substances is seen as the product of sequential interaction of actors and organizations with specific (sector) capabilities, ranging from when the chemical is manufactured to when it is disposed of as a waste. In this sense, it may be said that it is a concept that covers management lengthwise (from beginning to end), differing from other approaches which are analyzed by sector.

Through this approach, management of chemicals may be analyzed from a broader perspective, making it possible to put situations, problems, measures or actions in a wider framework that includes before and after stages in the history of the chemical's process. Thus, problems may be identified which may be strategically foreseen or corrected through actions taken in the early stages.

This opens up the possibility to solve problems which appear in a scope (of capabilities) of action in an organization, making it possible to find a solution even within the capabilities of another organization.

The National Implementation Plan has been developed on the basis of environmental policies as an additional tool that favors an environmentally sustainable development model with justice and social inclusion.

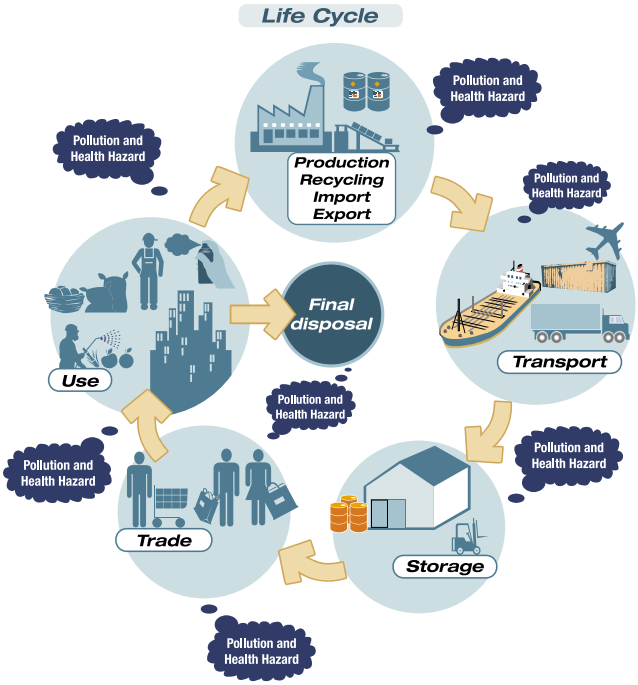


Diagram 2.1: Simplified diagram of the life cycle of chemicals

The governing principles that rule its formulation are as follows:

- The projected measures must be developed through an **integrated approach** to the problem, taking into account the life-cycle approach of substances and products.
- The **responsibility of actors** in all stages of the life cycle of the substances and products, including the principle of responsibility extended to the producer/importer.
- **Prevention** will be the key aspect to minimize harmful effects to health and the environment, involving the manufacturers' responsibility in the development and application of more efficient production systems, substituting raw materials for less dangerous ones or technological changes as well as suitable information management.
- **Gradualism and continuous improvement** in the application of measures. The implementation of measures planned in the

NIP will imply a gradual application tending to continuous improvement, which will make more effective action possible and which will follow the development of knowledge and technological development.

- **Flexibility and adaptability**. The diversity of situations that may arise with regards to POPs and other priority chemicals call for policy instruments that allow for flexibility in order to solve specific cases and make effective application viable, which means it must be economically sustainable.
- **Transparency and equity**. The implementation of the Plan must be based on a suitable management of information so that it is clear and available to any interested actor and the transparency of actions to be implemented as well as equity in the application of measures.

The Plan has also been developed taking into account that the following working assumptions must be made if the application of the measures planned is to be successful:

- **Inter-institutional support and multidisciplinary scope** in the formulation of programmes, projects and actions.
- **Articulation, coordination, cooperation and integrated action** of all actors related to substance management: government actors and the organized civil society: NGOs, trade unions, Chambers of Business, generators of knowledge and technologies, professional operators.
- **Harmony and availability of key information** for the management of chemicals and the implementation of the Plan.
- **Feasibility** in the implementation of planned measures.
- **The Plan** must be constituted as a **facilitating instrument for the application of international cooperation funds** in order to comply with the Convention.

2.2 GENERAL OBJECTIVES OF THE NATIONAL IMPLEMENTATION PLAN

Taking into account the general objectives of the Stockholm Convention and the framework in which it has developed, the following general objectives have been defined, as a consensus, for the NIP:

- Reduce risks posed to human health and the environment by persistent organic pollutants, through an improvement in the management of chemicals and substances and the management of solid wastes in Uruguay, developing and strengthening measures, as well as prevention and control instruments, in the whole life cycle and within the framework of the national environmental policy.
- Fulfill obligations arising from the Stockholm Convention.
- Strengthen and develop national institutional capacities and develop mechanisms that foster national coordination and integration for sustainable environmental management of chemicals and foster inter-institutional cooperation for the development of system capabilities.
- Increase awareness in the population and workers on the harmful effects and risks associated to the use of chemicals so that they take an active part in the management improvement process.

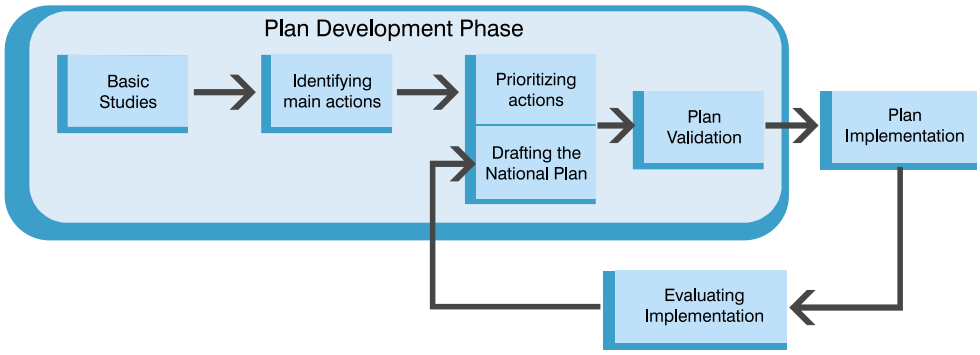
The Plan has been structured as a set of programmes, for which specific objectives have been determined. These specific objectives appear in Chapter 4: “Strategy and Action Plan”.

2.3 DEVELOPMENT PROCESS

The Plan has been developed taking into account the requirements of the Stockholm Convention, following the guidelines detailed in the provisional guide for the development of a national implementation plan for the Stockholm Convention (UNEP – GEF, December 2004).

The project for developing the NIP took place over a period of two and a half years, in which the different stages of the project were developed. Parallel to the process that allowed for the writing of this Plan, some implementation actions have begun, to consolidate and continue strengthening processes for POP management in our country. Diagram 2.2 provides a detail of the stages which have taken place in the process of developing the National Implementation Plan.

Diagram 2.2: Stages in the formulation of the National Implementation Plan



For the execution of the project, a group of national consultants was hired, forming an inter-disciplinary team which worked under the technical guidance of the Project Coordination Unit, formed by technical staff from the National Directorate for the Environment. A high level group was formed, the National Project Coordination Committee (NPCC), with key public and private actors. The NPCC's mission was to follow up and determine development guidelines for the plan. Several organizations, both public and private, took part throughout the process of developing the plan, providing their knowledge and point of view; this involvement has made it possible to successfully conclude the development stage of the Plan.

In order to carry out basic studies, the existing background information and data available nationwide on the different subject areas covered by the Convention were used, developing and applying a method for obtaining and updating information designed specifically for each programme. In this framework, the dioxins and furans stockpile was updated, the situation for managing transformers and other electrical equipment potentially polluted with PCB was outlined, sites potentially contaminated with POPs and other priority substances were inventoried for the first time, as well as pesticide stockpiles. Institutional capacity was evaluated, including the analytical capacity for the monitoring and evaluation of POPs in environmental matrices.

The culmination of basic studies made it possible to determine the national situation of each area covered by the Convention, identifying the main lines of action for the Plan's development.

A series of feasibility conditions were taken into account so as to design the programmes for implementation measures. Amongst them, the following:

- That the resources were available/could be made available to tackle them with reasonable success.
- That there be capacity in the actors involved to carry them out with reasonable success, whether this be with regards to the institutional capacity to implement them, or the conditions that make it possible to develop institutional capacities in the short term.
- That the measures had a suitable cost/benefit relationship.

Table 2.1 details the aspects / criteria taken into account to determine priority in actions.

Table 2.1 - Aspects / criteria taken into account to determine priority in actions.

Relevance or importance of the problem to be tackled	
Problem it aims at	• Intensity of the problem. • Scope of the problem: social (type and number of people affected), public awareness and concern; space/territory (local, national, regional, global), time (short, medium, long term), environmental (environmental compartments: soil, water, air, biota, population, global environment).
Fills a significant void	• Detected in the present management of chemicals.
Prevents future problems or conflicts	• Avoids or minimizes potential problems or conflicts, because it improves the capacities of key management actors, because it redirects productive processes towards the best available technologies, best available environmental practices, amongst others.
Constructs national capacity for management of chemicals	• Contributes to the articulation of actors and the creation / strengthening of coordinated, plural efforts. Strengthens the country's system capability, integrating municipal, national and regional levels and/or integrates different interested parties, e.g. businessmen, workers and state, amongst others.
Beneficiaries of the measure	
Quality and quantity evaluation of the beneficiaries of the measures	Giving priority to the population groups: • With greater exposure/risk. • With less resources to detect, know or act before risks, dangers or effects by chemicals or substances (knowledge, information, economic, organizational, access to institutions or organizations that are responsible or may contribute to the solution of the problem). • Per number, type (gender, age, frailty)
Expected impact of the measure in contributing to solve or lessen the problem	• Quantity/Quality evaluation of the expected impact of the application of the measure, differentiating whether it attends a specific problem or the resolution of general problems which serve as a base to solve specific problems.
Urgency	As a function of: • The present or potential problem. • The fulfillment of purposes and functions of the institutions, in the fulfillment of obligations arising from the Stockholm Convention, or in the fulfillment of obligations arising from the national regulations.

Workshops were held throughout all phases of Plan development, in order to promote the implementation of this project and to consult different organizations, both public and private.

In the final stages of the Plan's development, the project team developed an initial proposal on the programmes that make up the Plan, taking into account the evaluation carried out in the basic studies and the input from the organizations that took part in the workshops.

The consultation and validation process involved the organization of a workshop designed for this purpose, where the guidelines proposed for each programme were presented for the purpose of analyzing their relevance and the feasibility of being carried out with the key actors. Fifteen institutions took part in this workshop, amongst them representatives of the Executive Power, academics, members of the Chambers of Commerce, state companies and civil society organizations.

2.4 BASIC COMPONENTS OF THE NATIONAL IMPLEMENTATION PLAN.

The basic components that were evaluated and made up the development of the Plan are detailed below.

- A defined public policy for chemicals, substance and waste management which determines the key governing principles for sustainable development.
- Effective regulation providing order to this management, clearly stating the responsibilities for all actors, determining minimum technical conditions for management and promoting the application of cleaner production practices.
- Instruments and tools which complement regulation and whose objective it is to promote its application and to guide the generator's attitude towards better environmental performance.

- Stronger institutions with greater capacities to develop management control at all stages of the life cycle.
- Suitable infrastructure for storage, transport, treatment, recycling and final disposal of chemicals and wastes.
- Degree of social acceptance of technological solutions and development of citizen participation instances in decision-making, management and monitoring.
- Information systems designed and operated as a control, monitoring, evaluation and extension tool.
- Knowledge, awareness and education of the different actors involved in the management of chemicals, products and wastes.
- Coordination of action amongst public and private actors.

3 Country Reference

3.1 COUNTRY PROFILE

3.1.1 General characteristics of the country

Geography and climate

The Republic of Uruguay is one of the smallest countries in South America. It lies on the southeast of the continent, latitude 30 to 35 South and Longitude 53 to 58 west. It borders on the River Plate to the South, to the West with Argentina, to the North with Brazil, and to the East with the Atlantic Ocean. Uruguay's surface is 176215 km2 and 140000 km2 jurisdictional waters in the River Plate, Atlantic Ocean and Laguna Merín.

It has a Cfa type climate according to the Köppen classification; mesothermal damp with variable weather and year-round rains, without a definite distribution. Its landscape does not have significant geographic accidents. It consists basically of gently undulating grasslands. The highest point in the country is barely 513 m above sea level.

Political organizatio

Uruguay has a representative democracy with a presidential system and two legislative chambers: Representatives and Senators. The State is organized into three independent powers: Executive, Legislative and the Judiciary. The president and the legislators of both chambers are chosen every five years, voting is mandatory and universal.
The country's administration is divided into 19 departments and its capital is Montevideo.

Population

According to the 2004 Census by the National Statistics Institute (INE), the total population of Uruguay is 3241003 inhabitants, with an annual historical mean growth of 0.5%. The distribution of the population by age illustrates a vertical population pyramid: population under 15 years of age constitutes 23% of the total population, while those over 60 years old are almost 18%. Uruguay is the most aged country in the hemisphere.

The geographic distribution of the population also shows a marked pattern. 92% of the population lives in urban areas, and almost half the population lives in Montevideo. Table 3.1 shows the geographic distribution by age group.

Table 3.1 Population by geographic area, per age group.

AGE GROUP	POPULATION		
	Total	Total Urban Area	Total Rural Area
Total	3.241.003	2.974.714	266.289
0 a 24	1.275.858	1.173.089	102.769
25 a 49	1.064.901	974.457	90.444
50 a 74	708.267	646.523	61.744
75 o más	191.977	180.645	11.332

Source: National Statistics Institute – Census stage I – 2004

3.1.2 Economic Profile

Production

Uruguay's GDP was situated at USD 16796 current millions in the year 2005. This means an increase of 6.6% in real terms compared to the year 2004. As a consequence, the GDP per capita reached around US$5100 in current terms.

The GDP for the agricultural sector in the last ten years was about 11% of the Uruguayan GDP in average (USD 1865 million). The industrial sector's GDP was around 18% of the total GDP (USD3056). As can be appreciated on Table 3.2, the Uruguayan economy, as most world economies, is an economy trading mainly on business and services. These represented over 60% of the Uruguayan GDP in the last decade.

The evolution of the Uruguayan GDP by sectors in the last 5 years appears on Table 3.3.

These indicators reflect in part the economic crisis of the country between 1999 and 2002. They also show that it was the agricultural sector that first came out of the crisis, with an exceptional recovery between 2002 and 2004.

Foreign Trade

With regards to the country's commercial exchange, the exports of goods and services totalled US$5101.9 million in 2005 and imports were of US$4731.7 million. Tourism accounts for a fifth of total exports (US$1044 million). No specific item in traditional (meat, wool, etc.) or non-traditional exports reaches these levels. Table 3.4 details the recent evolution of the commercial trade balance.

On the other hand, Table 3.5 and Table 3.6 illustrate the volumes, in current dollars, of imports and exports, respectively, of the chemical industry and related industries in recent years.

In 2005, exports of chemical products and related items, represented 4% of total exports and imports represented 14% of the value of total imports.

Table 3.2 Uruguay's GDP, composition per sector

	Average Last ten years (1996 – 2005)
GROSS DOMESTIC PRODUCT	100,0
Farming	11,1
Fisheries	0,1
Mines and quarries	0,3
Manufacturing industries	18,2
Electricity, gas and water	4,2
Construction	3,0
Retail, Restaurants and Hotels	12,9
Transport, Storage and Communications	11,5
Financial institutions, insurance, real estate and services rendered to businesses	23,1
Communal, social and personal services	15,3

Source: Central Bank of Uruguay

Table 3.3 Total evolution of GDP and by area of activity

Real variation in %	**2001**	**2002**	**2003**	**2004**	**2005**
Farming	-7,1	5,1	10,5	10,7	3,2
Manufacturing industries	-7,5	-14,0	4,7	20,9	9,5
Elect., natural gas and water	1,7	-0,6	-7,4	1,9	6,4
Construction	-8,7	-22,0	-7,1	7,6	4,6
Trade and Hotels	-3,2	-24,5	-1,0	21,4	11,6
Transport and communications	0,3	-9,1	3,1	11,6	10,9
Other sectors	-1,8	-10,1	1,3	7,2	3,.5
Total GDP	-3,4	**-11,0**	**2,2**	**11,8**	**6,6**

Source: Central Bank of Uruguay

Table 3.4: Balance of Trade. Years 2000-2005, in millions of current dollars

	FOB exports	CIF Imports	Balance of Trade
2000	2299,5	3465,8	-1166,4
2001	2057,6	3060,8	-1003,3
2002	1861,0	1964,3	-103,3
2003	2205,9	2190,4	15,5
2004	2918,2	3113,6	-195,4
2005	3404,5	3878,9	-474,4

Source: Central Bank of Uruguay

Table 3.5: CIF Exports of products from the chemical industry and related industries, by Chapter of the Tariff Nomenclature (in millions of dollars)

	2005	2004
Chapter 28: Inorganic Chemical Products	27,713	23,586
Chapter 29: Organic Chemical Products	96,584	87,937
Chapter 30: Pharmaceutical products	85,003	78,166
Chapter 31: Fertilizers	96,193	98,014
Chapter 32: Tanning extracts, Paint, Varnishes and Dyes	39,159	33,674
Chapter 33: Oils, Toiletries, Cosmetics	33,508	29,519
Chapter 34: Soaps, Cleaning products, Lubricants, Waxes, Candles, Pastes, Dentistry Waxes	36,967	32,380
Chapter 35: Albuminoidal materials, Starch-based products, Glues, Enzymes	8,361	8,342
Chapter 36: Explosives, Pyrotechnics, Inflammable products	1,983	1,545
Chapter 37: Photographic or Cinematographic products	8,321	8,195
Chapter 38: Various Products of the chemical industry	113,829	97,601

Source: National Chamber of Trade and Services

Table 3.6: FOB exports of the chemical industry and related industries, by chapter of the Tariff Nomenclature, in millions of dollars

	2005	2004
Chapter 28: Inorganic Chemical Products	17,999	13,104
Chapter 29: Organic Chemical Products	8,552	10,426
Chapter 30: Pharmaceutical products	48,115	39,645
Chapter 31: Fertilizers	9,958	16,214
Chapter 32: Tanning extracts, Paint, Varnishes and Dyes	18,656	18,237
Chapter 33: Oils, Toiletries, Cosmetics	1,781	1,422
Chapter 34: Soaps, Cleaning products, Lubricants, Waxes, Candles, Pastes, Dentistry Waxes	33,666	22,128
Chapter 35: Albuminoidal materials, Starch-based products, Glues, Enzymes	3,506	1,511
Chapter 36: Explosives, Pyrotechnics, Inflammable products	0,0	0,0
Chapter 37: Photographic or Cinematographic products	0,196	0,159
Chapter 38: Diverse Products of the chemical industry	8,233	9,605

Source: National Chamber of Trade and Services

The Manufacturing Industry and the Production of Chemicals

Uruguay does not have public information on the GDP breakdown within the industrial area. It does, however, have estimates used by INE to draft the Physical Volume Index of industrial activity. The original purpose for determining these fixed values is to structure the industrial added value of the National Economic Activity Survey of INE for the year 2001 (2001 is the most recent year with enough information). According to this Survey, the manufacturing of chemical products and substances is 10.1% of industrial production. Within the chemicals and substances industry (see Table 3.7), almost a quarter of national production (23.7%) is destined for the external market. Of the production destined for the domestic market 18.4% is for the manufacturing of basic chemicals (43% of which are fertilizers). Within the remainder of what is produced for the internal market (81.6%), 3.5% are pesticides.

Table 3.7: Estimates of the Physical Volume Index of the Manufacture of Chemical Substances and Products

	%	
MANUFACTURING OF CHEMICAL SUBSTANCES AND PRODUCTS, DOMESTIC	**76,3**	
Manufacturing of basic chemicals.	18,4	
Basic chemicals.		57,2
Fertilizers.		42,8
Manufacturing of other chemicals.	81,6	
Pesticides.		3,5
Paint, varnishes, lacquers.		12,4
Manufacturing of pharmaceutical products and medicines.		64,2
Cleaning and toiletry items.		14,2
Other chemical products.		5,8
MANUFACTURING OF CHEMICAL SUBSTANCES AND PRODUCTS, EXPORT.	**23,7**	
Manufacturing of basic chemicals.	37,7	
Basic chemicals.		58,8
Fertilizers.		17,3
Manufacturing of plastics in primary forms, synthetic rubber, synthetic resins and artificial fibres.		23,9
Manufacturing of other chemicals.	62,3	
Pesticides.		1,2
Paint, varnishes, lacquers.		29,7
Manufacturing of pharmaceutical products and medicines.		64,4
Cleaning and toiletry items.		3,9
Other chemical products.		0,9

Source: INE

Employment and income

In January 2006, the unemployment rate, calculated by INE, and based on the data of the new Census of the year 2004, was 13.8%. This means that around 250000 people are jobless. On the other hand, the employment rate was 53.3% and the activity rate was 61.9%. The unemployment rate is higher than the rates at the end of the year 2005. Nevertheless, these are strictly methodological differences, given that after the new Census, INE changed its sample. The new sample, based on the 2004 Census is more representative. In any case, taking into account this methodological difference, Table 3.8 shows the main employment and income indicators and their recent evolution. The data for employment and income on Table 3.8, as well as the product evolution data by sector, shown on Table 3.3, partly illustrate the magnitude of the economic crisis that the country suffered between the years 1999 and 2002. The total fall in the product in real terms between those years was of 18%. The unemployment rate rose from 11.3% to 17.0%. Home incomes decreased by 33% in real terms. In the same period, real salaries fell by 21%. As of 2003, the country has regained growth. By 2005, production had reached the levels previous to the crisis.

Table 3.8 – Activity, employment and unemployment rates and average real household incomes, annual averages. Total Urban Country.

Annual average	Activity rate	Employment rate	Unemployment rate	Real income in January 2005 prices, Uruguayan pesos, including thirteenth salary
1999	59,3	52,6	11,3	20.638
2000	59,6	51,5	13,6	19.674
2001	60,6	51,4	15,3	18.525
2002	59,1	49,1	17,0	16.073
2003	58,1	48,3	16,9	13.857
2004	58,5	50,8	13,1	14.150
2005	58,5	51,4	12,2	14.344

Source: INE - Note: Average rate of exchange for January 2005: 1 USD = 25.525 pesos

Poverty and indigence

In the year 2005, the number of indigent and poor people decreased in Uruguay; something which had not happened for ten years. The proportion of poor households, which had dropped between 1985 and 1994, increased as of 1995.
The increase in poverty which began in 1995, accelerated between 1999 and 2002, during the crisis (IDB, 2004).

According to INE data, the percentage of people in indigent households dropped four tenths of a point in 2005, with regards to 2004, from 3.9% to 3.5%. The percentage of people in poor households dropped by little under 3 percentage points, from 32.6% to 29.8%.

Poor households are those with per capita incomes below the poverty line. The poverty line is the addition of the cost of a basic food basket estimated by INE in 2002 in function of the eating habits of the households in the second decile of the income scale, plus other non-food expenses (housing, education, health, etc.) Indigent people are those whose income is not above the cost of the basic food basket.

Table 3.9 Incidence of poverty per age group

	Age group	Percentage of poor people
2004	**Total**	32,6
	Less than 6	57,6
	From 6 to 12	55,3
	From 13 to 17	45,9
	From 18 to 64	29,1
	Over 65	10,8
2005	**Total**	29,8
	Less than 6	54,5
	From 6 to 12	51,7
	From 13 to 17	43,1
	From 18 to 64	26,2
	Over 65	9,4

Source: INE

The incidence of poverty by age groups is clear: poverty affects mostly the youngest (see Table 3.9).

Although social public spending has increased in Uruguay over the last few years, it has not reached this poor and young population (IDB, 2004). The country's social expenditure was 23.5% of the GDP in 2003, the highest in Latin America. Nevertheless, 70% of this expenditure was allocated (and is still allocated) to social security. This figure, the highest in the region, is because the population of Uruguay is an aged population. In the year 2002, in the middle of the crisis, unemployment insurance was 1.4% of the average household income within the most poor 20%, while pensions were 14% of the average household income.

3.1.3 Irregular settlements

One of the most important social trends of recent years has been the growth of irregular settlements. An irregular settlement is a group of (precarious) housing arrangements built by people occupying land which is not their own. These have had an exponential growth in the 90s (See Table 3.10).

Table 3.10 Evolution in the number of houses on irregular settlements during the 90s.

Year	Number of Houses on Irregular Settlements
1984	2.541
1990	4.835
1994	7.013
1995	9.828
1998	32.203

Source: Amarante and Caffera (2001)

According to the INE Census, 174393 people lived on irregular settlements in 2004. Once again, the proportion of children and young people on settlements is far above that of older people (See Table 3.11).
Living conditions on irregular settlements are bad: "with high levels of overcrowding, not only because of the distribution of people per room but also because of poor construction and equipment. There are serious shortcomings in home sewage and sanitary services, as well as in use of unsuitable land and non-viable locations for housing purposes. Average income is well below the average income of homes in Montevideo, even below the income of the upper limit of the poorest 20%; furthermore, the number of people per home is larger and the number of people with income per home is lower. A serious consequence of the above-described situation is social exclusion. This becomes more troublesome, if we bear in mind the proportion of children and young people living in these settlements is above 55%." (Amarante and Caffera)

Table 3.11 Population in Irregular Settlements by sex, per age group, total country

AGE GROUP	POPULATION		
	Total	Men	Women
0 to 24	96.976	49.256	47.720
25 to 49	56.120	28.461	27.659
50 to 74	19.051	9.501	9.550
75 or more	2.246	877	1.369
Total	174.393	88.095	86.298

Source: INE – Census, Phase I, 2004

3.1.4 Health

Table 3.12 shows the evolution of one of the most important health indicators. The infant mortality rate of every 1000 children born alive.

Table 3.12 Recent evolution in infant mortality.

Year	Infant Mortality Rate
2000	14,06
2001	13,88
2002	13,63
2003	14,95
2004	13,19

Source: INE

Table 3.13 details the estimates in health coverage for the urban population (i.e. towns of over 5000 inhabitants) for the year 2005. It shows that most of the population is covered by the health system, be it public (50%) or private (47%). Only a percentage of about 3% of the urban population lacks health coverage.

Table 3.13 Estimate of the percentage of the population residing in towns of 5000 or more inhabitants per health coverage in 2005.

Total	Without coverage	Private Hospital	Private Hospital and mobile emergency care	Only mobile emergency care	Public Health (1)	Public Health and mobile emergency care	Other (2)
100,0	2,8	21,5	24,4	1,0	37,5	4,8	8,0

(1) Includes Hospital de Clínicas (University Hospital)

(2) Includes Military Hospital, Police Hospital, Municipal Health Posts, Social Security Facilities.

Source: ECH – INE (2005)

3.1.5 Education

In Uruguay, primary school and the first cycle of high school are free and compulsory. As a consequence of this, only 1.5% of the population completely lacks formal education. The rest has some sort of education.

Table 3.14; Population estimate for 15-year-old or older residents in towns of 5000 or more inhabitants according to highest instruction level reached by 2005.

2005	
Highest level reached	**Total country**
Total	100,0
Without instruction	1,5
Primary school	33,8
Secondary school, Basic Cycle,	16,0
Secondary school, Second Cycle,	21,1
Technical Schooling	11,8
Teaching or Professor (Training)	3,4
University or similar	12,3

Source: ECH – INE (2005)

School enrolment reaches almost 100% in primary education. It then begins to decrease until it reaches 40% of young people between 18 and 25 years old.

These numbers do not illustrate the problem of educational lagging. A 15 year-old might be attending a schooling level below that corresponding to his/her age (See Table 3.14).

3.1.6 International comparison

Historically, Uruguay has had higher social and economic indicators than other countries in Latin America. This superiority has decreased over the last few years. As a consequence of the economic crisis in 1999-2002, Uruguay dropped to position 46 in the year 2003 after having been amongst the first 40 positions of the UNDP's Human Development Index.

Nevertheless, there is still a relative advantage of Uruguayan indicators with regards to Latin America, as can be appreciated in Table 3.15, the Human Development Index, life expectancy at birth, adult literacy rates, the gross combined rate of primary, secondary and university enrolment and the GDP per capita of Uruguay were higher than those of Latin America in 2003, the last available year with data allowing such comparisons.

Table 3.15 – Human development indicators in Uruguay and Latin America

	Human development indexes	Life expectancy at birth (years)	Adult Literacy rate	Gross enrolment rate	GDP per capita (PPP in US$)
Uruguay	0,840	75,4	97,7	88	8.280
Latin America	0,797	71	89,6	81	7.404

Source: UNDP (2005)

3.1.7 Regional and sub-regional organizations

These are the two main regional organizations which Uruguay is part of.

ALADI (Latin American Integration Association).

ALADI is the largest Latin American integration group. Its twelve member countries are: Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela. Together they have 20 million km2 and a population of over 493 million. The Montevideo Treaty, 1980 (TM80), is the global constituting and regulating legal framework for ALADI. It was signed on August 12, 1980, determining two general governing principles: pluralism in political and economic matters; progressive convergence in partial actions towards forming a common Latin American market; flexibility; differential treatments on the basis of each member country's level of development; and multiple forms for achieving commercial instruments.

ALADI seeks the creation of an area of economic preferences for the region, with the final objective of achieving a common Latin American market, through three mechanisms:

- A regional tariff preference system which is applied to products originating in member countries vis-à-vis those tariffs that apply for non-member countries.
- Regional agreements (common to all member countries).
- Partial agreements, by two or more countries in the area.

ALADI also opens its scope of action to the rest of Latin America through multilateral relationships or partial agreements with other countries and integration areas within the continent. Furthermore, it undertakes horizontal cooperation with other integration movements in the world and partial actions with non-member developing countries or with their integration areas.

MERCOSUR (Southern Common Market)

On March 26, 1991, Argentina, Brazil, Paraguay and Uruguay signed the Asunción Treaty, thereby creating the Southern Common Market (MERCOSUR), which is the most relevant international project to which these countries are committed to.

The main objective of the Asunción Treaty is the integration of the four Party States, through the free circulation of goods, services and productive factors, the establishment of a common external tariff and the adoption of a common commercial policy, the coordination of macroeconomic and sector policies and harmonizing rules in relevant areas, to strengthen the integration process.

At present, the following countries have joined the MERCOSUR as Associated States:

- *Republic of Bolivia – Since 1997;*
- *Republic of Chile – Since 1996;*
- *Republic of Colombia – Since 2004;*
- *Republic of Ecuador – since 2003;*
- *Republic Peru – since 2003; and*
- *Bolivarian Republic of Venezuela – since 2004.*

3.2 URUGUAY'S ENVIRONMENTAL SCENE AND THE POLICY CHALLENGES IT FACES

3.2.1 Environmental scene

Biodiversity and ecosystems

Because it lies in a transition area (ecotone) between the Southern Brazilian Subtropical ecosystems and the pampa and inland plains of Argentina, the ecosystems and scenery of Uruguay are very diverse.

The prairie is the prevailing ecosystem, covering 85% of the national territory.

Native forests, including palm forests, cover around 3.5% of the territory. Gallery or river forests are particularly important, with their exuberant vegetation and valuable habitat for many animal species; ravine forests that penetrate from the North, with high biological and genetic values; sierra forests, to the south, with lower forests; and the palm forests, which cover two wide areas, one to the east and one to the northwest of the country.

Wetland ecosystems have several environmental values, among them their ability to regulate water systems, contributing to their purification, and also because they are the habitat for several flora and fauna species.

Coastal ecosystems are marked by the presence of sandy soils, or peat or rocky formations distributed along the River Plate and Atlantic Ocean. They are under pressure from growing urbanization, port building and tourism.

Some 1200 vertebrate species have been identified in Uruguay, among them fish, batrachians, reptiles, birds and mammals. Native fauna faces pressures deriving from changes in natural ecosystems, and the impact of poaching and agriculture.

Water, air and soil quality

Uruguay has a privileged location in the neo-tropical region insofar as to its availability of both surface and ground fresh water sources. The main ones among the surface waters are the watersheds of the Laguna Merín basin, the Santa Lucía River and the Eastern wetlands. Insofar as to ground waters, there is the Guaraní aquifer (one of the largest in the world, shared with three other member countries of the MERCOSUR); the Mercedes aquifer, on the western coast, and the Raigón aquifer, in the south.

In general terms, water quality (surface and ground), can be considered good. The impact on the coastal environment associated to cities which lie on it, has a coastal effect, with short reach along the horizontal axis of the water course. For their part, inner water sources which go through urban areas have high organic pollution as well as industrial pollution indexes, derived mainly from dumping sewage liquids, industrial effluents and solid wastes.

Among the sources that pollute water resources, although significant progress has been achieved by reducing dumped loads, it is still necessary to go deeper into measures tending to minimize the loads of both sewage effluents and industrial effluents. Parallel to this, actions tending to improve solid waste management are being developed, another important source of water pollution.

Because of its geography and winds, Uruguay does not have serious environmental problems associated to air quality, and it can be assumed that air quality ranges from good to excellent. In Montevideo, capital city, there are no areas of high atmospheric pollution and the main affecting source is transport. In general, the quality problems detected are located and associated to some agro-industrial activities. Despite all this, the country does not as yet have an air quality programme to allow it to objectively determine its quality. Installed capacity for monitoring and control of activities affecting air quality, including mobile and fixed sources, is yet insufficient and must be strengthened.

Uruguayan soils are very diverse, most of them are suitable for livestock and a considerable percentage is suitable for agriculture. Their fertility ranges from medium to high. It is estimated that 30% of the surface of the country is affected, with erosion levels ranging from low to moderate. Together with effects from droughts, erosion and degradation of agricultural soils are the main environmental problem in the rural area, even though they have not reached alarming stages.

Regarding soil pollution, there is little knowledge of the presence of pollutants in this matrix. Progress on this subject has concentrated mainly in urban areas, where specific studies have been carried out making it possible to identify sites possibly contaminated with metals.

Productive activities and the environment

Uruguay is essentially a farming country, with ranching, agriculture and forestry being the current source of over 65% of exports.

Production of meat and wool on natural pastures is one of the traditional pillars of the Uruguayan economy, and milk production also has considerable relevance for the country's exports.

The main environmental aspects associated to farming activities are the use of agrochemicals and soil management. In the last few years the liberation of Genetically Modified Organisms (GMOs) has gained worldwide relevance. Recently, a participation process has begun, seeking to define the National Bio-safety Framework.

The manufacturing industry weighs heavily in the GDP structure; sectors dealing with the processing of agricultural products are the most relevant. The main environmental aspects associated to this activity are location, management of emissions and solid waste problems. Environmental problems generated as a consequence of emissions into the environment by productive sectors have gained increasing relevance both because of their environmental impacts and because of the people's increased environmental awareness. In some cases, they have derived into local conflicts where, in general, the conclusion has been negative both for the measures taken by the State and for the investments made by the productive sector. Control over this sector has centred mainly on the dumping of effluents, operating under command and control mode. Environmental solutions applied by industries have, in turn, concentrated on the treatment of effluents, with the application of cleaner production practices being still in its early stages. This makes it possible to improve the efficiency of the processes and to decrease their environmental impact. Lack of regulations ruling the generation and management of solid waste and environmental emissions has been limited to actions tending to integrate the environmental variable as part of the productive process.

In the last decade, there has been a change in the operations of some companies, determined mainly by quality management systems, with certification being regarded as a comparative competitive advantage.

Solid and environmental waste management

Despite the fact that within the last decade a series of significant improvements have been applied to solid waste management, the subject still requires strong action by the central government; both to provide order and to minimize impact on their health and the environment.

At a national level, with regards to rules and regulations, progress has been made in guidelines for the management of solid hospital waste; the approval of regulations for the management of solid industrial waste is forthcoming.

Concerning solid industrial wastes, the main management flaws are determined by the lack of suitable infrastructure for the treatment and disposal of wastes, and the practices of minimizing and valuing wastes are also incipient. These flaws have an impact on the quality of ecosystems, and at the same time they become a barrier to productive development. The lack of specific rules regulating the generation and

management of these wastes is currently one of the greatest weaknesses.

With regards to the management of solid urban wastes – under municipal government – different quality standards apply to the services depending on the size of the town being served, municipal development and the financial and economic ability of each local government. The main restrictions arise from general budget restrictions and in particular the specific restrictions applied to that sector.

It must also be pointed out that the informal sector has a significant role in the management of industrial wastes. This makes it necessary to consider the insertion of a social component which would make it possible to improve environmental and sanitary conditions in which that activity is being developed.

The metropolitan area of Montevideo, with an area of 1276 km2 has a total population of about 1770700 inhabitants, concentrating more than 50% of the country's total and most of the industrial activity. For this area, the "Metropolitan Area Solid Waste Master Plan" is being developed. This initiative is a key element to improve waste management on the basis of an integrated system, which further includes setting technical criteria, suitable infrastructure and a series of inter-institutional agreements. Integrating three departments in the development of this Plan will also allow for a management example beyond political-administrative limits.

Beyond dealing with classic solid waste: urban, industrial and hospital wastes, the country has begun to develop special waste management systems under the framework of the application of the principle of extended responsibility. Under this framework, a system has been developed and is in operation to deal with wastes of lead-acid batteries. Furthermore, regulations are being developed for the packaging Law, by which the producer / importer must have a packaging-related waste management system.

At present, State institutions –at both national and municipal levels- as well as the population in general, identify and share the existence of a waste management sector which is significant for the quality of life in cities. The existing successful results and changes in the participation modes of social actors and non-governmental organizations in waste management are some of the elements identified as the main strengths.

Poverty and the environment

At present it is estimated that in Montevideo and Canelones there are some 419 irregular settlements where approximately 130,000 people live. Segregation in poverty location has led to many settlements being on potentially degraded soils, close to floodable land, putting their inhabitants in a more vulnerable environmental and sanitary situation.

A large number of the rubbish scavengers that make a living from the collection and classification of potentially renewable materials (organic and inorganic) live in these settlements. They endure terrible environmental and health conditions because of their economic activity.

Climate change and environmental protection

Although Uruguay is not within the group of the main countries responsible for climate change, net CO2 emissions have decreased over recent years, due to the absorption of CO2 partly resulting from the increase in forested areas. In 1990, 5810 net kilo tonnes of CO2 were emitted, while in the year 2000, the net absorption of CO2 was recorded at 3708 kilo tonnes.

Regarding substances that deplete the ozone layer, in the last decade, the national consumption of CFCs has decreased by 70%, from 316 tonnes/year in 1992 to 91 tonnes/year in 2004. During that period, US$4.5 million were transferred for the readjustment of the industrial sector (with donation funds coming from the Multilateral Fund for the application of the Montreal Protocol).

Due to the high vulnerability of the country's coast, production and energy, a set of measures has been taken to adapt and alleviate the effects derived from climate change. These measures are aimed at the agricultural sector (for soils, crops, livestock,

pastures, etc.), the coastal areas, biodiversity, the energy sector, the fishing and coastal resources, water resources and human health.

On the other hand, as pointed out in the reports by the Intergovernmental Panel on Climate Change, various severe atmospheric phenomena (tornadoes, strong winds, heavy rains, floods, droughts, etc.) are integrated into the general characteristics of the regional climate and could sharpen in intensity and frequency due to global warming.

Energy and the environment

Energy consumption has shown sustained growth. In Uruguay, and taking into account years with normal rains, 90% of electricity is generated by hydroelectric dams. The final energy consumption of wood, charcoal, and biomass wastes (all of them renewable fuels) provides almost 20% of the total national energy matrix.

Uruguay is conducting studies tending to promote the use of renewable energy from the implementation of aeolian parks, solar panels, use of biomass (including rice husks and forestry wastes) and biodiesel. Although their estimated contribution to the energetic matrix is small, they have environmental benefits regarding the local prevention of water, air and soil pollution; favour the country's technological and productive development; and reduce both vulnerability derived from buying fossil fuels or electric energy from abroad, as well as vulnerability to adverse climate (such as droughts). With resources from GEF, the first investment project for lessening greenhouse effect emissions was carried out, using biogas from a sanitary landfill to generate electric energy.

Climate and atmospheric environmental emergencies

Uruguay has a set of environmental emergencies in its climate and atmosphere, among them lightning, tornadoes, strong winds, hail and heavy localized rains and drought.

Drought is the most adverse phenomenon, with high social, environmental and economic impacts affecting both the agricultural sector and the energy sector. As an associated phenomenon, there are often important forest fires, due to larger forested areas mainly with single crops of eucalyptus or pine. The economic cost of droughts (which happen at least once every 10 years) is estimated to be over US$200 million; followed by floods, with estimated costs of at least US$3 million per year.

Citizen participation, access to information and environmental education

Uruguay has a strong tradition of citizen participation in environmental issues, reflected by the existence of several boards, commissions and inter-institutional committees which deal with different subjects (cleaner production, philogenetic resources and environmental bio-safety, amongst others). The Advisory Technical Commission for the Protection of the Environment (COTAMA) stands out, as an inter-institutional committee involving several actors, which operates within the Ministry of Housing, Use of the Land and Environment in which representatives of NGOs, chambers of commerce, the University of the Republic, the Congress of Mayors, several public companies, and departments of the central government take part. The COTAMA is a forum for discussion and joint planning which has made it possible to analyze and propose relevant subjects for national environmental management.

In addition to this, and as a part of the Environmental Impact Assessment (EIA) process, public hearings are carried out, to include the opinion of the local population that is directly involved in the enterprises being evaluated. Nevertheless, this process must be appraised in the light of experience, in order to implement improvements in the participation level.

Regarding environmental education and information, some –incipient-- initiatives can be pointed out. These initiatives seek to create a public access system for environmental information and to develop an environmental

education strategy coordinated with several public institutions.

With regards to environmental education, the National Environmental Education Network has been recently created (August 2005) for sustainable human development. The Network was organized by the Ministry of Education, together with the University of the Republic, ANEP and the Ministry of Housing. Its purpose is to create a forum that operates as a mechanism for meeting, programming and undertaking the coordination of all institutions that develop Environmental Education activities in the country.

The Network brings together entities and organizations from the most diverse levels, as well as academic and institutional organizations involved in the matter.

3.2.2 Main challenges in environmental policy

Promoting environmental governance and citizen participation

It is essential that the country make progress in the development of public policies and management models that contribute to generating environmental governance. Tensions associated with the current form of using land and its productive development can be overcome if public organizations consolidate a clear and participative performance. In order to do this, there is a need for an in-depth analysis and qualification of the meeting and joint-planning areas available for the environment which bring together diverse public and private actors interested in the social and productive development of Uruguay.

Organized civil society, as well as the productive sector, should be recognized for their contribution to looking for approved solutions which make it possible to undertake their own sustainable development with social inclusion and justice, respecting the current legal framework.

Capacity building, improving resources and inter-institutional coordination for environmental management

Historically, Uruguay has suffered a strong lack of coordination amongst the different State organizations dealing with environmental control, land management and development and the promotion of national production and technology. It is vital to renew and strengthen the institutional capacities of the State to ensure effective environmental management in tune with the challenges faced by the country. Legal frameworks must be developed to strengthen bio-safety management, improve participatory management of Protected Areas as well as the Conservation and Sustainable Use of Uruguay's biological Diversity, and to effectively integrate the environmental variable in productive development policies.

Promoting decentralization and improving local environmental management

Uruguay should strengthen the role of municipalities in local and micro-regional environmental management. In order to do this, it is necessary to make the capacities of the National Directorate for the Environment compatible with that of the Environmental offices in municipal governments, in such a way that it is possible to fulfil and control different activities taking into account current legal regulations. It is necessary to promote the permanent presence of technical and management staff of public institutions in sensitive areas of the managed land.

Improving installed and analytical capacity for monitoring environmental control

It is necessary to improve and strengthen the State's installed and analytical capacity, so as to ensure that their control purposes are fulfilled, and to provide the population with a safe and transparent system. A National Network Monitoring System should be implemented

for environmental quality, involving the main industrial enterprises which are or will be set up in the country, ensuring a reliable and fluent source of information. Furthermore, participatory monitoring programmes should be designed incorporating the local population in the follow-up and control of environmental management, to complement controls carried out by the different national and municipal institutions. To date, joint actions have been taken by the Ministry of Housing, Use of the Land and Environment and the Ministry of Health for the integrated and participatory control of chemical industries. Several agreements have been signed for monitoring and controlling different effluents and monitoring stations have been set up in sensitive areas of the country.

Contributing to the development of a sustainable and productive Uruguay

One of the main challenges which Uruguay faces is to promote the growth of a productive and sustainable country model, with justice and social inclusion. The new government has taken specific steps to overcome the social emergency (Poverty crisis), but there is as yet no deep debate which contributes to identifying the axis of a sustainable national development policy. Sustainable agricultural development, control in the use of chemical substances, suitable soil management, promotion of cleaner production systems, environmentally suitable solid waste management, promotion of renewable energies and adequate use of the land are some of the subjects which should be part of a sustainable national development policy.

Adapting and developing new environmental sector regulations and the development of economic instruments that promote sustainable production should be key tools to fulfil their implementation.

Improvement in public management and access to information

The country must create a National Environmental Information System which coordinates and unifies information, dispersed among the different institutions and which allows easy access both for public information and decision-making.

Implementing educational, training and environmental sensitisation programmes

It is necessary to improve the education, training and sensitisation programmes both for the population and for key decision-makers related to national environmental management. The country has been undertaking sustained efforts in environmental education through NGOs, the University of the Republic, private universities and education centres, and programmes such as PROBIDES and Ecoplata.

Improving compliance with international conventions and management of cooperation resources

Uruguay has signed several environmental Conventions and Protocols within the United Nations framework, under which it has the obligation to comply with standards and commitments in terms of biodiversity conservation, management, traffic and control of chemicals and climate change, among others. National environmental policy must ensure that such commitments are fulfilled, improving the use of the international cooperation resources associated with them.

3.3 LEGAL AND INSTITUTIONAL ENVIRONMENTAL FRAMEWORK

3.3.1 Environmental policies and legal framework

Uruguay has taken important steps to develop an explicit national environmental policy and to have environmental laws which specify their main guidelines and management instruments, especially during the last decade of the 20th Century. At first it was, to a certain extent, a pioneer in the region; but then it lagged behind considerably in environmental legislation.

Therefore, long-dating laws can be mentioned, such as laws on fauna (Laws No. 2358 and 3135 of 1895 and 1906 and, especially, Law No. 9481

of 1935, currently in force) and the creation of parks (such as Laws 8172 and 9718 of 1927 and 1937) or in recent decades, the Water Code (Decree-Law No. 14859 of 1978) and the Soil and Water Conservation Law (Decree-Law No. 15239 of 1981).

Even before the Stockholm Convention (United Nations Conference on the Human Environment, 1972), Uruguay had already approved Law 14053 of December 30, 1971, by which the National Institute for Environmental Preservation had been created.

Nevertheless, it was necessary to consolidate the return to democracy, for the environmental concerns of some social and political sectors to attain institutional and legal reflection. Thus, the Ministry of Housing, Use of the Land and the Environment (MVOTMA) was created and within it the National Directorate for the Environment (DINAMA) with Law No. 16112 and No. 16234, respectively, both of 1990.

The Executive Power (through the **Ministry of Housing, Use of the Land and the Environment, MVOTMA)** is exclusively responsible for the coordination of integrated management by the State and public entities in general. The MVOTMA was created with Law No 16112 on May 30, 1990 and it carries forth its environmental purposes through the **National Directorate for the Environment (DINAMA)** as its specialized executing branch.

DINAMA is responsible for developing, executing, supervising and evaluating national plans for protecting the environment and for proposing and orchestrating national policy on the subject. Its functions include increasing environmental awareness, environmental control of public and private activities and establishing relationships with specialized international organizations.

On the other hand, within the orbit of the MVOTMA the Advisory Technical Commission of Environmental Protection (COTAMA) was created through Decree 261/993 of June 4, 1993. Thus, an area for consultation, advice and coordination was set up, given its broad inter-institutional integration, by means of delegates from public and private organizations, including, among others: The University of the Republic and the Congress of Mayors.

Uruguayan environmental laws have developed particularly over the last fifteen years, providing the basis for national environmental policy.

Within these laws, the main one is the **General Law for Environmental Protection, or LGPA**, (Law No. 17283, November 28, 2000) that determines that promoting a sustainable environmental development model is a basic duty of the State and also of public entities in general.

National environmental policy should be based on the principles provided for in Article 6 of the LGPA, particularly the principles of prevention, caution, trans-sector scope, information, participation and international cooperation; in order to distinguish Uruguay among all countries as a "Natural Country", from an economic, social and cultural perspective of sustainable development.

Nevertheless, in 1996, the **National Constitution** in its article 47, declared that environmental protection was of general interest, determining the generic duty of people to abstain from any action that causes depredation, destruction or pollution according to the environmental protection laws, foreseeing that the law would regulate such protection.

Under the initiative of this Ministry and within the framework of public opinion movements related to a new international event known as the Earth Summit (United Nations Conference on the Environment and Development, Rio de Janeiro, 1992), a law was submitted to the Legislative Power and finally approved as Law No. 16466 of 1994. This law is known as the Environmental Impact Assessment Law.

This law fulfilled a very important role in the consolidation of environmental legislation, especially through the regulations of the Environmental Impact Assessment Rule (EIA - Approved by Decree 435/994) by which the Previous Environmental Approval (AAP) was created. In 2005, the AAP regulation was modified, to include new instruments and broaden the scope of its application. (Decree 349/2005).

Other important, but more recent laws, are the Law on Trans-boundary Movement of Hazardous Wastes (Law No. 17220 of 1999), the National System Law of Protected Natural Areas (Law No. 17234 of 2000), the Laws for Lead Pollution (Law

No. 17774 and No. 17775 of 2004), the Law for Packaging and Package Waste (Law No. 17849 of 2004) and the Law for the Prevention of Acoustic Pollution (Law No. 17852, 2004).

Although national environmental policy and laws on the matter place great emphasis on prevention, general sanction regulations are foreseen for not complying with environmental laws.

Despite any sanctions that may be applicable, whoever depredates, destroys or pollutes the environment will have civil responsibility for all damages caused. Furthermore, if it were materially possible, he/she must undertake actions to redress the damage. Article 4 of Law No. 16466 (1994) determines that "when damages following such violations are irreversible, the person responsible must undertake all measures tending to their maximum reduction or mitigation, notwithstanding the administrative, civil or penal responsibilities which may be applicable."

With the development of environmental laws as reviewed, Uruguay has the necessary legal basis for the environmental management of chemicals and for the approval of the implementation of specific regulations.

Article 20 of the LGPA marks the importance that national legislation assigns to the suitable management of chemicals, especially those considered toxic or dangerous. The MVOTMA is responsible for determining the applicable conditions for protecting the environment, during all stages of their use and management.

Furthermore, all other organizations within the sector, in coordination with the MVOTMA must incorporate in their regulations rules that ensure that the environment is protected against the adverse effects derived from the normal use, accidents or wastes that may be generated by or derive from chemical substances.

In a similar manner, MVOTMA can develop the provisions and apply the necessary measures to regulate the generation, collection, transport, trading, treatment and final waste disposal.

Within this framework, by means of Law No. 17732 (December 31, 2003), Uruguay approved the Stockholm Convention on Persistent Organic Pollutants and its annexes. Uruguay is then committed to comply with the obligations set forth in the Convention using the mechanisms determined by it. Uruguay was the seat for the First Conference of the Parties to the Stockholm Convention, in Punta del Este, in May 2005.

3.3.2 Roles and responsibilities of key ministries

Table 3.16 details the organizations which are related to the management of chemicals, as well as health and the environment. It also provides a brief description of the capabilities directly related to each one of them.

Table 3.16: National organizations and roles regarding management of chemicals

Organization		Roles
Ministry of Housing, Use of the Land and the Environment	National Directorate for the Environment	• Developing, executing, supervising and evaluating plans to measure and evaluate the quality of environmental resources: water, air and ecosystem resources, including natural protected areas and coastal areas. • Developing, executing, supervising and evaluating plans to prevent environmental impact of human activities or projects, including the encouragement of environmental awareness, with priority for the planning and holding of educational, training, information and extension activities tending to adopt behaviours that are consistent with environmental protection and sustainable development. • Developing, executing, supervising and evaluating control plans for public and private activities that influence the quality of environmental resources, as well as its own official recovery and redress plans. • Developing and coordinating action with national and department organizations in what regards environmental protection, supporting environmental management by department and local authorities and of public entities in general; as well as celebrating agreements with specialized public and private people, national or foreign, for the execution of their purposes. • Establishing and maintaining relationships with specialized international organizations, to ensure that conventions or promised action for the environment are complied with.
Ministry of Economy and Finance	DNA (National Directorate for Customs)	• Verification and control of customs operations, loading, unloading, shipping goods, issuing compulsory classification criteria for the application of tariff nomenclature and to provide, notwithstanding other capabilities, the relevant data to provide foreign trade statistics.
	Tax Free Areas /General Trade Directorate	• Administration, supervision and control of Tax-free zones.

Organization		Roles
Ministry of Livestock, Agriculture, and Fisheries	General Directorate for Agricultural Services	• Suggesting and developing proposed policies and regulating projects for: plant health and quality, agricultural inputs, animal feed, grain storage and the hygiene, health and quality of plant food. • Developing technical specifications for phytosanitary aspects, the quality of plant products and agricultural inputs; residues of pesticides and animal feeds; as well as adopting and proposing such regulations as arise from international commitments in the diverse areas. • Verifying and certifying compliance with national and international laws to which Uruguay subscribes, for the trade of fruits and vegetables, plant products and agricultural inputs and pesticide residues. • Developing, administrating and supervising the national protection and phytosanitary surveillance system. • Developing, administrating and supervising the systems for the registration and control of phytosanitary products (agricultural chemicals) and the nutritional suitability of feed for animals.
	National Directorate for Livestock Services	• Guiding, administrating and executing animal health policies and veterinary health policies, in coordination with other institutions and organizations in the public health area. • Orienting, administrating and executing protection policies for food and products of animal origin, by controlling the conditions of production and processing of food and products of animal origin as well as hygiene and health aspects. • Providing the technical basis for developing and updating the framework of legal regulations of the activities linked to animal health, veterinary public health, protection of foods and products of animal origin. • Control and certification of the sanitary and health-sanitary conditions of entry, import and export of animals, genetic material, products of animal origin and inputs for the use in animal health and production, for an optimal national health situation and to satisfy the requirements of international markets.
	National Forestry Directorate	• Promoting forestry and the use of wood through tax exemptions for the import of inputs (machinery, chemicals and others).
Ministry of Public Health	Health Products and Medical Technology Division Department of Environmental and Occupational Health	• Analysis of the population's health situation gathering the relevant information. • Planning health policies according to analyzed information, priority problems and different related agents. • Drafting health promotion, quality of life and prevention policies. • Authorizing the operation of and registering institutions, companies, products and professionals in the health sector in order to ensure quality levels. • Controlling companies producing or trading in sanitary products (for example medicines, domisanitary products) and other related companies according to standard; and the operations of the health sector.
Ministry of Transport	Hazardous Goods Transport Department	• Regulation and control of the national road network. • Regulation and control of the transport of hazardous goods on national roads.
Ministry of Labour and Social Security	National Labour Directorate National Employment Directorate General Labour Inspection and Social Security	• Regulation and control of labour legislation. • Improving conditions in which work is performed and dignifying workers. • Labour police. • Training workers.
Ministry of Interior	National Fire-fighters Brigade	• Directing all necessary operations to deal with fires and disasters. • Intervening in all events, whatever their nature, that entail immediate danger to lives and goods. • Cooperating with other public organizations to avoid, eliminate or suppress disasters of any kind in their initial phase.
Ministry of National Defence	Arms and Materials Service	• Control of the manufacturing, trading, transport, storing and employment of hazardous substances used for war purposes, within the national territory.
	National Coastguard Authority	• Maritime security authority, in charge of guidelines for prevention, organization and procedures to deal with a situation of pollutants spills coming from ships, aircraft and naval artefacts in the national maritime area.
Ministry of Industry, Energy and Mining		• Control by registration of the companies that import, export, produce, use or sell, drug precursors to avoid illicit traffic of precursors, chemical products and psychotropic drug solvents.
Ministry of Foreign Affairs		• Relating with foreign States and international organizations with regards to international matters attributed to other Ministries. • Treaties, conventions, contracts and agreements between the State and other national institutions or bodies or foreign or international states or institutions.
ANP-National Port Authority		• Supervising that all regulations for the transport of hazardous substances by sea are complied with.
LATU-Uruguayan Technological Laboratory		• Performing analysis and tests to verify the nature and characteristics of products imported for temporary admission and of the articles made with them which are exported.

Source:

1- Websites of the organizations.

2- Legal regulations for the Administration (July 2005)

3.3.3 International commitments on chemicals, national status

Table 3.17 features a summary of international agreements regarding the most relevant chemical substances which have been signed or are in the process of being signed by Uruguay.

Table 3.17: International Instruments regarding chemical substances which have been signed by Uruguay.

Instrument	Comments / Observations	Law
Stockholm Convention on Persistent Organic Pollutants	Taking into account the precautionary principle stated in principle No. 15 of the Rio Declaration on Environment and Development, the purpose of the Convention is to protect human health and the environment from persistent organic pollutants.	Law No. 17732 Passed 31/DEC/2003
Rotterdam Convention For the application of prior informed consents to certain dangerous chemical products and pesticides which are traded internationally.	The purpose of this Convention is to promote shared responsibility and joint efforts of the Parties in the realm of international trade of certain dangerous chemical products, in order to protect human health and the environment from possible hazard and to contribute to their rational use, making it easier to exchange information about their characteristics, establishing a national decision-making process on the import and export of such products and informing these decisions to all Parties.	Law No. 17593 Passed 29/NOV/2002
Basel Convention On the control of trans-boundary movements of hazardous wastes and their elimination.	Protect human health and the environment against the damages entailed by hazardous waste, and reduce their generation to a minimum from the point of view of quantity and potential dangers.	Law No. 16221 Passed 22/OCT/1991
Amendment to the Basel Convention Regarding control of trans-boundary movements.	Amendment adopted at the Third Meeting of the Parties held in Geneva on September 1995.	Law No. 16867 Amendment 19/SEP/1997
Amendment to the Montreal Protocol regarding substances that deplete the ozone layer, held in Copenhagen.	Amendment adopted at the Fourth Meeting of the Parties to the Montreal Protocol, held in Copenhagen, from November 23 to 25, 1992.	Law No. 16.744 Amendment 15/MAY/1996
Amendment to the Montreal Protocol regarding substances that deplete such Layer, held in London.	Amendment adopted at the Second Meeting of the Parties to the Montreal Convention, held in London, June 27 to 29, 1990.	Law No. 16.427 Amendment 28/OCT/1993
United Nations Framework Convention on Climate Change Within the framework of the United Nations conference on the Environment and Development.	The purpose is to achieve, in agreement with the relevant rules of the Convention, the stabilization of greenhouse effect gasses in the atmosphere, at a level that avoids dangerous anthropogenic interferences in the climate system.	Law No. 16.517 Approved 22/JUL/1994
Kyoto protocol Framework convention for the United Nations on Climate Change, signed in Kyoto	With the purpose of promoting sustainable development, each of the Parties to the convention on climate change, will apply and / or will continue to draft policies and measures according to their national circumstances, will seek to exchange experiences and information on policies and measures, in particular by developing ways to improve efficacy, transparency and comparability.	Law No. 17279 Approved 23/NOV/2000
Hydrocarbons contamination Uruguay adheres to the International Convention on Cooperation, Preparation and Fight against Hydrocarbons Contamination	The Parties commit themselves, together or individually, to take all suitable steps in agreement with the regulations of this Convention and its Annex, to prepare itself and fight against the events of hydrocarbon pollution.	Law No. 16521 Approved 25/JUL/1994
Seawater Pollution By Hydrocarbons, civil responsibility by damages caused because Uruguay signed the international convention.	Amendment to the International Convention on the Constitution of an International Compensation Fund for Hydrocarbons, Brussels 1971 (by Protocols of 1976 and 1992)	Law No. 16820 Amendment 23/ABR/1997
MERCOSUR Framework agreement on the environment	The purposes of this agreement are sustainable development and environmental protection, by articulating economic, social and environmental dimensions, contributing to a better quality of life and environment for the population.	Law No. 17712 Approved 27/ NOV/2003
Inter-government Forum on Chemical Substances	The Forum is the mechanism for exchange, consultation and multi-sector discussion. It provides a Forum for participation where all government, international, regional and national organizations, industry and NGO's form alliances, make recommendations and monitor processes. The Forum is for consultation and provides advice to identify priorities, recommends agreed international strategies, promotes coordination mechanisms, identifies voids, promotes the exchange of information, and evaluates progress for agreed action and recommendations.	Not Binding.
Strategic Focus for the Management of Chemical Products	The Focus was adopted on February 6, 2006 in Dubai, United Arab Emirates by the International Conference on Chemicals Management.	Voluntary application

Table 3.17: International Instruments regarding chemical substances which have been signed by Uruguay.

Instrument	Comments / Observations	Law
Chemical weapons Convention on forbidding development, storage, destruction and employment	Each Party State commits itself not to develop, produce, acquire or in any other way store or preserve chemical weapons and not to transfer those arms to anybody, directly or indirectly; as well as to destroy the chemical weapons it owns or are abandoned on its territory.	Law No. 16520 Approved 22/JUL/1994
ILO Convention No. 184 on safety and health in agriculture, 2001	The Members should develop, put in practice and periodically examine a national policy that is in line with safety and health in agriculture. Its objective is to prevent work accidents and health damages as a consequence of work.	Law No. 17828 Approved 15/SEP/2004
International Labour Organization Conventions are approved on the subject of safety and health in the work determined.	On the safety and health of workers, adopted by the General Conference of the ILO on its 67th meeting held in Geneva on June, 1981.	Law No. 15965 Approved 28/JUN/1988
ILO International Convention No. 170 Chemicals Convention	Prevent illness and accidents caused by chemical products at work or reduce their incidence: guaranteeing that all chemical products are evaluated with the purpose of determining the hazard they pose.	Convention in approval process.

3.4 NATIONAL POP SITUATION IN URUGUAY

3.4.1 Chemical Substances Management

In Uruguay, the **general management of chemicals** is an aspect of environmental and health management that is still being developed. The **General Law for Environmental Protection** (Law No. 17283), in its article 20, states that protection of the environment against any effects that may derive from the handling and use of chemical substances is of general interest. In this sense, although there is progress in the development of a specific legal framework, it is still pending.

As a whole, the degree of development in the management of chemicals is highly uneven, both among the different areas of activity and in the degree to which they cover the life cycle of chemicals and their preparations; indeed some aspects and stages remain unsolved. Sectors that show a more developed management level are those that combat pests, both agricultural and domestic, as well as human and animal medicines. These are associated to activities that in Uruguay go back far in time, and have a high volume of operation.

In this context, international commitments ratified for chemical substances, both for environmental aspects (Stockholm Convention, Rotterdam Convention, Basel Convention, Kyoto Protocol, among others) as well as for aspects related to health for example, represent a very important drive towards managerial progress.

Tackling POP problems means, in some cases, solving aspects that are shared by that group of substances and by others. As an example, we can mention the generation of stockpiles that are past their due date and their wastes. For this reason, in Uruguay, the answers to the matter of POPs have been tackled from a wider perspective, which includes the management of chemicals in general.

In general, one may say that the growth and improvement in the field of managing chemical substances was not paramount to the increased activities involving them.

Nevertheless, some common aspects have been contemplated through sector regulations. A characteristic aspect of chemical substance management at a national level is the degree of fragmentation of the relevant organizations and often the lack of fluent coordination among the organizations involved in the life cycle.

During the data collection stage, information was gathered on trans-boundary operations with POPs, for which the foreign trade database of the National Customs Authority was consulted, as well as private databases. For POP pesticides, the results obtained this way were compared to those obtained from the pesticide data collection programme.

This type of study shows gaps in the **generation and management of information** for the country's management of chemical substances and although it does not imply judgment on individual performance of State organizations,

it does show limitations from the point of view of their joint performance. Specifically, the usefulness of the information generated to date is being analyzed, as a tool to carry out data collection, inventories, estimates of releases into the environment and diagnosis. In this sense, it was often found that it was not possible to successfully compare information from different sources. This may be due for example to different levels of detail, different resolution abilities within the systems, or even that some information is on paper and reviewing it entails an excessive number of man-hours.

To overcome this situation, it is essential to have an electronic link for information on substances being managed, in a compiled format that allows minimum traceability of the chemicals in the country and makes it possible to create a global vision of management. This information should serve as a basic resource for the analysis and development of policies and strategic activities such as the implementation of plans for substitution and elimination, among others. This made it possible to detect the need to strengthen aspects related to information management as a tool to manage chemicals.

Despite relatively limited development in the general management of hazardous substances, there are basic tools and instruments in operation which are of common use. These were introduced by the private sector, but have not been incorporated as a formal requirement and therefore in some cases they do not have an extended use, for example **safety data sheets**.

With the exception of some cases applicable to specific environments, for example transport (IMDG Code, United Nations recommendations on Transport, Model Regulations), there is a lack of a national definition of hazardous substances supported by a system for its **classification**, which would enable the building of a solid framework of regulations. With regards to **labelling** and safety data sheets, several formats coexist, and there are no harmonized guidelines for their design.

Good communication of hazards and information contributes to the reduction of environmental risks, including health risks. On the other hand, there is an international trend towards the harmonization of classification systems and labelling of chemicals. For this purpose, the United Nations has developed a Globally Harmonized System, which has in this context been identified as a tool to support and complement the implementation of the Stockholm Convention.

Another gap which has been detected is the lack of definition of **responsibilities** along the product chain; that is, the collective and individual responsibilities of those that undertake activities, mainly for trade, with chemicals, in particular in what concerns the reporting of hazards.

In what regards controlling **entry** into the **country** due to trans-boundary operations, some aspects needing strengthening were identified. During import operations, data is generated which often does not make it possible to identify beforehand the chemicals involved in such operations. This makes it difficult to collect data and carry out inventories of specific chemicals.

Furthermore, for **transit** operations, goods are being transported without entry verification, and this, in turn, means that some substances of unknown identity are being transported throughout the country.

The system of **tax-free areas** is another vulnerable point because no entry verification is required; verification is only carried out in case the goods are imported into Uruguay from the tax-free area. Thus, unidentified substances enter the tax free areas, which after being stored for long periods in abandonment, end up being destroyed in the country, generating even more pressure on Uruguay's scarce and precarious waste management abilities.

This scenario is aggravated by the lack of resources the institutions have to carry out routine controls of chemicals. Over time, these activities have been relegated to secondary roles. In this sense it is necessary to review the implementation and efficiency of different controls in the chemicals management and to strengthen analytical control stages as an essential and

strategic activity in operations control. This would allow closer compliance with regulations.

The **records** system which exists to date (pesticides, Decree 149/977, medicines Decree 324/999, domisanitaries Decree 256/00, psychotropic substances, drug precursors Decree 196/98) for produced or imported substances essentially covers business activities. As is the case of pesticides, there are records which are not mandatory for some kinds of activities. In such a case in particular, the registration of products for sale is encouraged through tax exemptions. Thus, importing for one's own use is not included, which is an aspect to be evaluated vis-à-vis the perspective of control or restriction of substances that may arise from management or international commitments. On the other hand, the current registration system does not cover the range of chemical substances, leaving a void with respect to **dangerous substances** for all uses and throughout their life cycle.

In this way, aspects are left behind which should be strengthened for the purpose of control, implementation of disposal policies and restriction of certain substances.

In this regard, it is worth pointing out that the pesticides the Stockholm Convention deals with are already included in national laws (Decree 000/005), and are forbidden throughout their life cycle. See Annex I.

For the **transport** of dangerous goods and substances by earth, sea and air, there are specific sector regulations with defined guidelines and tools, such as classification and labelling systems specially designed for such purpose.

The **storage** of dangerous substances takes place in several ways associated with transport, productive activities or as a commercial activity devoted to the storage of merchandise. Beyond storage that is strictly related to transport (air, sea, land), this stage of the life cycle is scarcely contemplated in the legal framework. The industrial sector, despite limitations, is the one that historically has greater development regarding the inclusion of safety aspects during storage. No guideline frameworks or minimum technical requirements are available so that the storage of substances is safe for the environment and for human health.
Specific training for the goods storage sector as regards substances, their management and their incompatibilities is an activity that is beginning to gain momentum.

Associated to management levels are aspects of security in the event of contingencies or spills. In this area, the technical regulations framework must be determined to establish design and operation requirements, for secondary contention systems and also for a strategy to prevent **spills** in activities with chemicals.

Complementing this, it is necessary to strengthen knowledge of material and human resources available at a national or state level or in private companies, in the event of a contingency. It would also be very valuable to have an updated list (inventory) of easy access, which also included basic technical data, their geographical location, and contact information.

The degree of knowledge on industrial activities and in particular of those using chemicals does vary. It is generally obtained by requirements in other aspects of management, such as environmental regulations, industrial drainage requests, and studies of environmental impact, among others.

In the global context of productive activities with substances, it can be said that synthesis chemistry has a lesser role, but formulation and fractionating activities are important and are identified as sectors to be tackled.

Thus, on a national level, the production of substances, particularly POPs is an activity which is not much developed and most of the substances used in the country are foreign and in some cases enter industrial processes or are subsequently fractionated for their sale in the domestic market.

From the point of view of **trade** in the domestic market, save some specific exceptions such as

explosives, medicines of restricted use, narcotics, and drug precursors (Law No. 14294, Law 16034, Decree 761/98/), the access, sale and **use** of dangerous chemicals is not greatly restricted or controlled. On the retail scale, the purchase of dangerous chemicals is relatively simple because it does not require permits, specific training or the recommendation of a qualified technician. At this stage, the transfer of information on the dangers involved is scarce or nil. Thus, the marketing of substances both at the retail and wholesale level is an aspect of the life cycle and management of chemicals which remains to be ordered and developed.

Waste management, particularly of those wastes which could be regarded as dangerous, is only beginning to be set in order. In the last few years, different initiatives have been developed to improve the management of several currents of wastes, and the management of solid hospital wastes, acid lead batteries and the regulation of agro-industrial wastes and service wastes is forthcoming. The biggest limitation in our country is the lack of suitable infrastructure in order to treat and dispose of wastes polluted with hazardous substances.

Finally, with regards to society's **education** and **training**, there is a need to determine strategies and materials for the progressive creation of a culture of risk and the promotion of good practices in the management of chemicals.

3.4.2 Institutional Capacity

During the development of this project, Institutional Capacity was identified and described for the management of POPs and other chemicals, within the framework of the updating of the National Profile in 1997.

The analysis of institutional capacity for Uruguay was made on the basis of key concepts according to the GEF[1], which appear below:

Institutional capacity is understood to be *the aptitude or quality that institutions have, individually and collectively, to reach certain objectives, develop certain activities, and fulfill certain tasks, in the management of chemicals*.

Main components of institutional capacity:

- Legal framework, policies and plans: efficiency, overlapping, deficiencies or contradictions.
- Purposes or subjects it develops or should develop.
- Faculties or legal powers, including instruments.
- Resources:
  - Human resources, quantity, training, availability, management
  - Material resources, infrastructure and equipment.
  - And economic-financial resources, including the possibility of real income: prices, rates, loans, donations.
- Internal structure, adaptation of the organization to its purposes and capabilities, both from the point of view of the organization of our own resources, of their efficient use, and of providing mechanisms to relate to other relevant actors to fulfill them. It also implies the existence of instruments and mechanisms that make it possible to articulate the different activities and programmes in projects and policies that make up a strategy that can give them coherence and continuity, in order to achieve objectives in the short, medium and long term.
- Activities it effectively carries out and relevant projects that have been carried out or are currently being carried out, as well as those that have been developed but that, for some reason, it has not been possible to undertake.
- External relationships: With other organizations and actors, communication and coordination: inter-institutional programmes and activities, mechanisms for relating to users and civil society (participation) to find out about needs, provide answers and be able to self-evaluate in relation to these points.
- Information management: a) activities for generation, gathering-updating,

1 GEF 2001. Guide for the self-evaluation of the needs of the country with regards to capacities for providing order to the global environment.

documenting, use, extension of the relevant information for fulfilling its purposes, both specific and generally related information. b) availability of information and relevant databases (organized, systematized, harmonized and updated): contents, types of access, identifying unfulfilled needs or deficiencies.

Using the GEF criteria, the ability "*of people, institutions and systems to adopt and carry out decisions and perform functions in an effective, efficient and sustainable way*" was encompassed within institutional capability or capabilities, and a systemic approach was adopted taking into account three levels:

- Institutions System Level, the capacity resulting of the interaction among the set of institutions, through their formal and informal relationships, under the framework of specific and general policies that rule the management of POPs and other chemicals.
- Individual level of the Institutions centred on an analysis of the capacity to operate and the general performance of organizations and their possibilities to fulfill their purposes and functions. The institution will be focused as an integral system encompassing the organization itself, the groups and the people which make it up.
- Personal level within the institutions. It is centred on the processes which the institutions develop to provide knowledge, and develop aptitudes and attitudes which foster the commitment with the function, through programmes, participation and the exchange of knowledge.

Within the framework of the project, the task was to illustrate institutional capacity for the management of POPs and other chemicals, at all stages of their life cycle, for all activities, the practices and actors involved, from the perspective of their rational management, as is set forth in Chapter 19 of Agenda 21 and more specifically for our country in Article 20 of the **General Law for Environmental Protection (LGPA)**.

An *inventory* of social actors related to the management of chemical substances was made in order to have a map of their real dimension and complexity, since they are regarded as an important input in the analysis of institutional capacity. The identified actors may be grouped into the following categories:

- Relevant state organizations at two levels: at national level, the ministries; and at department level, the municipalities.
- Importers, manufacturers and fractionating operations.
- Transport sector.
- Retail and wholesale tradesmen.
- Those related to warehouses and depots.
- Users, those who manage substances directly in the productive processes, transport, storage and disposal; including professional users: businessmen and workers, but also domestic users.
- Academic institutions. The University of the Republic, and Research Institutions (INIA-National Agriculture and Livestock Research Institute, LATU-Uruguayan Technological Laboratory), among others

To review the institutional capacity for the management of chemical substances which Uruguay has today, the *reviewing* of *secondary information* was combined with the effects of gathering and systematizing information on the management of chemicals. Key actors were selected and interviewed, on the basis of their incidence in the management of chemicals and to cover most parts of the stages of the life cycle, to be consulted in regards to their vision on institutional capacity and its components, on a personal level through interviews following a semi-structured form. The emphasis was on relevant State organizations.

From the joint analysis of the reviewing of secondary information and from these interviews, the following conclusions were drawn:

- With regards to the components of institutional capacity: legal framework,

purposes and faculties, Uruguay has a legal framework that makes it possible to protect people and the environment from POPs and other chemicals.

- Nevertheless, flaws in regulations were found mainly in the use stage of the chemicals' life cycle, activities involving the use of chemicals in industry (Convention 170 of the ILO is not ratified by the country), in farming and specifically in households. In particular, the PIT-CNT (Workers' Trade Unions Federation) and the Ministry of Labour agreed on the need to have the necessary regulations to protect the health and safety of workers in agriculture and livestock farming, which according to the General Agricultural Census of the year 2000, involved some 157,000 workers[2]. This would be on the same line as Decree 406/88 for the Prevention of Labour Accidents which covers "any public or private endeavour of an industrial, commercial or service nature" or Decree 372/99 for Preventing Risks and Occupational Accidents in the forestry sector.
- Another revealed weakness is the lack of suitable knowledge of the legal instruments even among the relevant State offices. This may be due to the lack of mechanisms for suitable and sufficient availability in the education and training of actors intervening in the management of chemicals at different points in the life cycle and from different roles, technical staff, users, controllers, etc.
- Great shortcomings in control abilities when applying current legislation were unanimously pointed out, not related to gaps in the legal framework but to problems in the internal structure of institutions. That is, competent institutions in POPs and other substances have had significant achievements in different partial aspects; but still, in what refers to an integral approach of the life cycle, their own resources are not adequately organized, nor do they have suitable procedures to relate to other relevant actors to fulfill their purposes and capabilities. This reveals flaws in external relations among institutions, which result in insufficient communication and coordination, causing overlapping and deficiencies.

The lack of instruments and mechanisms which would make it possible to articulate the different activities, projects and programmes (because of the lack of a national policy for the management of chemicals, including POPs, and of a strategy to give them coherence and continuity, for the purpose of attaining the short, medium and long term objectives), means that human, material and economic-financial resources are inefficient due to duplications and voids.

Information management is one of the most clearly identified weaknesses. This is so in terms of the activities relative to the generation, collection-updating, documenting, use and extension of information amongst the relevant State organizations for the fulfilment of its purposes. It is related to the above-mentioned aspects of the internal structure and external relations, as well as to the lack of suitable tools and procedures for information management: relevant data bases (organized, systematized, harmonized and updated), procedures and protocols to share general interest information, at least among the competent State organizations. These procedures have not as yet been developed and, in general, each institution uses its own self-generated information, without taking into account, save for exceptions, contributing to a national information system on POPs and other chemicals which would make it possible to know, draw and control substances throughout their life cycles, including the different actors and activities involved nationwide.

When studying the strengths and weaknesses of the information mechanisms involved, it was found that information in general is fragmented, dispersed and in some cases the systems involved do not have enough resolution powers to discriminate substances (residual categories in classifications, etc.). Tools have been identified to satisfy the need to have precise and trustworthy information available quickly; but for that it is necessary to generate a super-institutional information system which gathers, harmonizes and eventually completes existing

2 To this date, Law 17828 has ratified Convention 184 of the ILO "Health and Safety in Agriculture" which among others refers to agrochemicals and protects employed farm workers.

information. The legal framework to do this does exist: "It is of public interest, so that services are better provided, to ensure permanent and direct exchange of data and information among all units and divisions of the Public Administration, whatever its legal nature or institutional position, through any available means of communication, without any limitations other than those provided for in Article 80[3]",Article 14 of Decree 500/991. It would be necessary to implement it, setting up information flow systems among the relevant state organizations, tending towards the interconnection of electronic information equipment or similar means. Furthermore, the Administration may provide the service of partial access to its electronic data bases to people or legal, state or semi-official organizations or private organizations which it considers of interest in order to contribute to managing chemicals with better information, in order to minimize risk.

Having the precise and trustworthy information, in a suitable format is essential to sustain agile and effective decision-making in environmental management. Information is a key tool for the management of chemicals, for preventing and minimizing risks. In this sense, databases are a contribution to relate information needed with information offered. That is why a database was built, the directory of environmental labs, in order to organize information on Uruguay's analytical capacity. It was made available through computer systems on the pages of the National Directorate for the Environment and the National Implementation Plan. Article 33 of Decree 500/991.

Another aspect which was identified as an important shortcoming in the management of POPs and other chemicals, is analytical capacity. Analytical capacity is understood as the set of resources in infrastructure, equipment, human and economic resources which the country has in order to determine the quantity and quality of chemicals in its environment, in the population, in food and in products; for evaluation and monitoring purposes, and to sustain decision-making and the implementation of actions. Therefore, their approach goes beyond that of inventorying infrastructure, equipment and technical resources, and into weighing institutional components with information needs to sustain decision-making.

With the purpose of deepening its knowledge on a national level, work was undertaken in close cooperation with the laboratory of the National Directorate for the Environment and with the constant support of laboratories. The collection, registration and availability of information were tackled as a process. For the first phase, information was collected on national laboratories that determined parameters and matrices of environmental interest and a directory was formed. For the second phase, information was collected on the techniques, reference methods and quality-securing actions for each of the parameter-matrix determinations, and these were incorporated in the directory. The results were made available to the laboratories, at the end of each phase, through seminars and through the web. For a third phase and on the basis of prior results, a technical strengthening programme will be proposed (training, inter-laboratory exercises), institutional (steps towards a network of environmental laboratories, mechanisms for specific cooperation). The Directory of Environmental Laboratories and the process for constructing it was a key tool in articulating needs with existing capacities; it has 49 public and private laboratories and is available since June 2005 on the web pages of the National Directorate for the Environment and the NIP www.nip.gub.uy.

A proposal was set up to strengthen both analytical and institutional capacity, implementing a NETWORK of public and private laboratories which determine POPs (and other parameters in environmental matrices), generating information for evaluation, execution of actions and measuring efficacy, sustaining the making of decisions that makes it possible to provide society with trustworthy information.

3 Confidential or restricted information.

3.4.3 Pesticide Management

General Aspects

The group of chemicals which include pesticides is particularly important in our country.

Although the approach used was that of the life cycle, special emphasis was put on the use component, because it is this span of the life cycle which has greater implications on the environment and health and because it is the least regulated one.

Of the almost 18 million hectares of the national territory, approximately 13 million are used for farming.

Livestock production has a dominant role, 66.1% of the national territory, followed by agricultural crops (soy, rice, wheat, barley, sunflower, corn, sorghum) with 5.6% and forestry with 3.7%. Horticulture and fruit crops, including areas for growing vines, citrus and potatoes, cover 0.3% (Source – Agricultural Economic Information Directorate DIEA – Ministry of Livestock, Agriculture and Fisheries)

Distribution of farming production in our country is wide, which means that pesticides are used on a large area of territory.

The use of pesticides for livestock production is usually not very intensive. It is agricultural crops which have the largest volumes of use. Although the area used for horticulture and fruit production is small, it accounts for the entry into the country of a large variety of pesticides, due to crop diversity, each one with its own characteristics and specific pests.

In the last few years, pesticide imports have had a strong increase (Table 3.18).

Table 3.18: Imports of technical grade active substances in tonnes (includes raw materials)

Type of pesticide	1999	2000	2001	2002	2003	2004	2005
Herbicide	2324	2399	2975	3232	5377	6697	6726
Fungicide	883	686	908	1077	1149	1163	1120
Insecticide	659	533	577	800	889	1096	1238
Others	574	165	177	226	196	330	481
Total	**4440**	**3783**	**4637**	**5336**	**7611**	**9286**	**9566**

Source: Input control department. DIEA, MGAP

In 2005, over 9500 tonnes were imported, which means double the imports registered for 1999, 2000 or 2001. Within pesticides, the group with the largest increase is that of herbicides and within herbicides, glyphosate is the substance that has virtually determined such a trend.

Glyphosate is the most used pesticide in our country (5321 tonnes in 2005), accounting for 56% of the pesticides and 79% of the herbicides.

The increase in the import of pesticides for agricultural use is associated with:

- The explosive growth in soy crops in the last few years.
- The generalized application of “no-till” (a technique which substitutes mechanical tilling of the land with the application of glyphosate herbicide prior to sowing the crops).

In the past, the use of pesticides at an industrial level, has generated concern in sectors such as tanning and wood treatment sites, because of the possible use of pentachlorophenol. Therefore, a study of the biocides used in these sectors was undertaken. The results show that pentachlorophenol is not used in Uruguay for processing leather and furs. Nevertheless, sodium pentachlorophenate is used for treating wood, although with little intensity of use.

Main legal regulations

Registration, control and sale of agricultural pesticides are regulated by Decree 149/977 (General Directorate of Agricultural Services-DGSA, MGAP). The mechanism consists of registration as a condition for commercialization. The regulation also includes sale under professional prescription for "highly toxic" or "very toxic" products. It also includes a due date for registration permits. Furthermore, it demands that the person registering declare the chemical composition of commercial formulas (active and inert ingredients) and, among other information, acute toxicity for man, fish, domestic animals and bees.

The DGSA carries out chemical composition analyses and confirms the pesticide's effectiveness. It demands from the person registering that international bibliography on each pesticide be submitted. Regulations determine the contents of the labels with which the product will be sold, detailing use specifications (dose, waiting time (for the use of products such as meat and milk), contraindications, and precautions, among other information).

The registered products (pesticides and raw materials) are exempted from tax payments (customs duties and levies, import taxes, port rates and others).

Decree 264/2004, regulates the registration of users or companies that make land pesticide applications (Single Operator Registration), while 457/01 controls the companies which make aerial applications of pesticides. There is a regulation which determines areas excluded from the application of phytosanitary products by air and land (Ministry resolution of May 14, 2004).

The sale of **pesticides of veterinary use** is regulated by the General Directorate of Livestock Services of the MGAP, through registration implemented by the Veterinary Laboratories Division. In this case, the full spectrum of pesticides is not covered either, as only trade is regulated.

Domestic or domisanitary use products are regulated by the Department of Foods, Cosmetics and Domisanitaries of the Ministry of Public Health, by decree 180/000, by which the MERCOSUR Regulation for domisanitary disinfectants (pesticides), approved by resolution 49/99 of the Common Market Group is adopted for Uruguay.

For this group of pesticides, there are difficulties in accessing information on the substances used, safety indications, etc.

Situation of POP pesticides of the Stockholm Convention

In our country, since 1997, registrations and authorizations for the sale of organochlorinated pesticides for agricultural use have been revoked. The POP pesticides of the Stockholm Convention are included in this measure, with the exception of dodecachlorine (mirex). Nevertheless, it did not include other uses of such chemicals. As an initial step and vis-à-vis the commitment undertaken, to take measures to reduce or eliminate emissions derived from intentional production and use, the MGAP revoked the registries and authorizations for the sale of mirex. In 2005, the Executive Power decreed a ban on the introduction, production and use, in any way or under any regime, in areas under national jurisdiction, of chemicals and preparations or formulations containing the 9 pesticides included in the Stockholm Convention. The ban included all forms of use, including agricultural use, industrial, domestic, sanitary and any form of possible use of such substances. The only exception is the importing of amounts destined to be used for research at laboratory scale or as a reference pattern (See Annex 1).

If we study the importing of POP pesticides by period, independently of the compound, the largest entry of active substances of POPs in Uruguay was between the years 1978 and 1983, headed by Aldrin (See Diagram 3.1). The period during which the greatest entries of these substances were recorded is between 1978 and 1988 (see Diagram 3.2).

Diagram 3.1: Evolution of imports of POPs for Uruguay which are included in the list of twelve cited by the Stockholm Convention, analyzed by Substance (Duran, A. 2005).

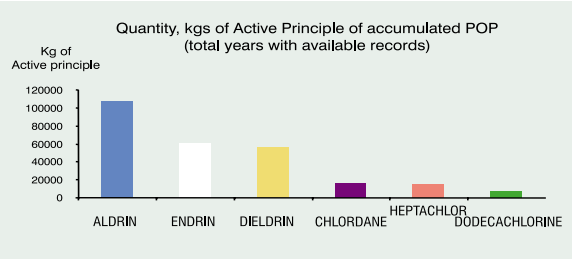
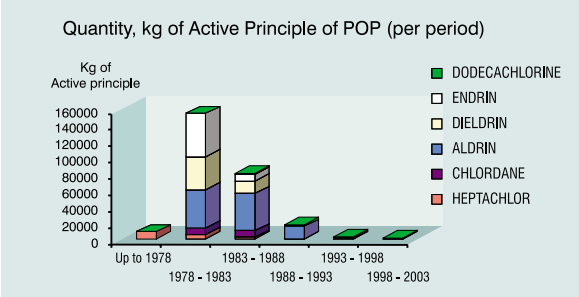


Diagram 3.2 Evolution of imports into Uruguay, of POPs that are included in the list of twelve included in the Stockholm Convention, analyzed by period (Duran, A., 2005).



The information that appears on the graphs refers to existing records. The absence of import records of Toxaphene and Hexachlorobenzene is because they were never registered for agricultural use; in the case of DDT, the last entries are prior to 1978.

Starting in the mid-80s and up to the mid-90s, a constant reduction in the imports of all POPs listed above can be seen, with the exception of one, Dodecachlorine, which continued for the purpose of combating ants, until it was banned in 2005.

Taking into account the national situation on pesticides included in the Stockholm Convention, the project set out to identify a set of chemical substances to go deeper into studies about their use. The selection was carried out taking into account the volume used, as well as the intrinsic characteristics of the pesticide. The identification of this set of priority pesticides does not imply a suggestion for banning or elimination, but the recommendation of studying their use to regulate it and avoid misuse, deviations in use or unnecessary use.

Proposed chemicals for the project are: Endosulphan, Paraquat, Chlorpiriphos ethyl, Metamidophos, Glyphosate, Mancozeb, Copper Sulphate, 2,4-D, dimethylamine salt and Lindane (which despite being banned for agricultural use, is in the list of POP Review Committee, Subsidiary Organ of the Conference of the Parties).

Biological Residues of pesticides in foods

The Advisory Committee appointed to study the national problem of biological residues in foods of agricultural origin was created on July 25, 1984 by Decree No. 296/984. Later, on June 25, 1991 (by Decree 332/991), a modification in its member parties was introduced. Currently, its members are several Directorates of the Ministry of Livestock, Agriculture and Fisheries, from the Ministry of Health and representatives of the meatpacking industry, the Uruguayan Rural Association and the Rural Federation.

Nevertheless, the regulations in force are those provided by the National Sanitary Regulation (NSR, decree No. 315/994), which determines maximum residue limits (MRL) allowed for a series of combinations of pesticides and foods. Furthermore, the NSR determines that for MRL which are not set forth in its text, those determined in the Food Codex (FAO – WHO) should be used.

The widest experiences of analyzing residue levels of pesticides in foods of agricultural origin have occurred in export-related sectors, associated to the demands made by destination countries. For agricultural products traded on the domestic market, research is very scarce. In this sense, some experiences carried out in fruits and vegetables have shown results which their authors have deemed “auspicious”. In a weekly sampling of the Mercado Modelo (the country’s largest wholesale market for fresh fruits and vegetables), in 2005, 258 samples were carried out, and showed that less than one percent of the samples had pesticides above the MRL determined by the NSR, although several multi-residue cases were detected (residues of more than one pesticide in the same sample), as were unregistered pesticides for the analyzed crop.

The DILAVE (DGSG) carries out controls of biological residues in food of animal origin. In the last few years, over 3,000 analyses were made in meat from pig, horse, sheep, cattle and avian origin, without detecting residues of the POP pesticides from the Stockholm convention.

There is great difficulty in the extension of information related to biological residues in food, and therefore in making progress in the implementation of measures to improve pesticide management. Because it is a very sensitive subject for the general population, there is a fear that managing the information openly might have a withdrawal in the demand for farming products or other negative commercial consequences. In general, great reservation was found at institutional level in the management of information related to this subject, associated to the above-mentioned fears which generate pressures on the political sector.

Sound practices in pesticide management

During the last 10 years, demand trends related to healthy consumer habits and concern for the environment were undertaken by some actors related to production, research and farming extension and in this way, working guidelines have appeared which seek to promote more responsible management of pesticides and of the environment, in order to minimize the negative impacts of production on human health and ecosystems.

In this period it is worth noting the work carried out by the **Integrated Production Programme**. The Programme is an example of successful inter-institutional work, for which a decree exists regulating production, trading, identification and certification of fruits and vegetables obtained through integrated production methods.

As of 2005, the **Responsible Production Project (PPR)** operates within the Ministry of Livestock, Agriculture and Fisheries, financed with World Bank / GEF funds. Its purpose is to promote responsible management of natural resources and to define the promotion of associated practices with integrated management as one of its priority working guidelines. The subheading of PPR is "Integrated Management of Natural Resources and Biological Diversity" and its mission is stated as: "Promoting the adoption of an efficient and integrated system of natural resources and biodiversity, which is sustainable from the social, economic and environmental viewpoints." The programme will operate through projects for the financing of activities which imply an improvement in the management of natural resources. The target public is farmers, preferably those working in groups and larger financing percentages are available for small farmers.

In our country, it is relevant to mention **organic production** endeavours, in which commercial use pesticides are almost not used at all. As can be seen on Table 3.19, the surface of organic production under certification in Uruguay is almost 757 thousand hectares; there are more than 500 certified farmers, mainly livestock, horticulture and bee farmers (Organic Guide, 2003, Farm Development Programme (PREDEG) GTZ).

The main items in which organic agriculture is developed in Uruguay are: beef, vegetables, fruits, honey and its by-products, rice and other cereals, aromatic and medicinal herbs, wine, milk and its by-products, and preserves.

Table 3.19 Distribution of the main certified organic production items, according to area covered

ITEM	SURFACE (HA)
Livestock	753.937
Dairy products	1.093
Extensive Agriculture	718
Citrus	500
Fruit	310
Horticulture	303
Aromatic and Medicinal Herbs	16
Bees	11.400 beehives
TOTAL	**756.877**

Source: Organic Guide 2003, PREDEG – GTZ

The following summary, mentions the main problems identified with the use of pesticides at a national level:

- Legal tools regulating pesticides are insufficient and are not designed with a life-cycle approach. They also have significant voids in aspects related to environmental protection and human health including occupational health.
- There are not enough tools to monitor pesticides in the environment, health and foods.
- Applied research on the subject of pesticides is scarce and not necessarily within a research programme.
- Integrated Management of Pests or Good Practices is scarce or inadequately driven.
- Sensitization / training levels on the subject of pesticides are limited for actors related to different phases of the life cycle.
- There is little inter-institutional articulation, which means that actions are isolated and uncoordinated.
- Existing information is atomized and access to it is often difficult.
- The different actors related to the stages of the life cycle show a low degree of knowledge of present environmental and health problems related to the consequences and the use of pesticides.
- Current registry regulations do not apply to pesticides which are imported directly by the final consumer and tend to regulate trade rather than use.
- Access to information on the regulations in force or safety measures by the users is not adequate.
- No control is foreseen for the application of pesticides by farm owners or farmhands.
- The level of knowledge on the magnitude of applications of pesticides, in what refers to forms of application, affected area, chemical used, dose, and water expenditure is not good.
- The fulfilment of the request for a professional prescription is not verified at the sales points of pesticides for agricultural use class Ia and Ib.
- There is a lack of registration and specific regulations for pesticides whose use is different to farming, veterinary and domisanitary use.

3.4.4 Stockpiles

General aspects

Stockpiles are those pesticides that must be eliminated because their use is not possible or desirable.

Stockpiles may include the following:

- Technical pesticides and formulations past their due date.
- Pesticides whose use has been forbidden or strongly restricted.
- Deteriorated products:
  - Those which have undergone physical or chemical changes which make them phytotoxic for crops or unacceptably dangerous for human health or for the environment.
  - Those which are no longer biologically efficient.
  - Those that have undergone changes in their physical properties that make them incompatible for standard application equipment.
- Pesticides which are unwanted by their owners, though they may be in working conditions.
- Unidentified products.
- Products contaminated with other substances.
- Pesticide wastes generated in fires, climate accidents or other accidents.
- Materials which are strongly contaminated with pesticides.
- Wastes generated from the manufacture or formulation of pesticides.

Generation of such wastes proceeds from different actors. The small quantities derived from use by farmers, experimental stations, or research institutes, represents a more or less constant flow of waste over time. Another small percentage arises from the management of stocks of products during trade. Both cases include products deteriorated by bad

working or storage conditions, wastes originated from mistakes in planning the purchase or in the use of the product, or products past their due date because of prolonged storage.

Taking into account the volumes involved, waste generated from the manufacture or formulation of pesticides should also be considered. It is an important source and its origin may be due to, among other causes, poor storage management, products out of specification, defective raw materials, or confiscated products (for example, when the use of a pesticide is forbidden or restricted).

Transport accidents, fires, spills or other kinds of accidents in deposits, account for incidental and scattered volumes.

Related to such wastes, environmental liabilities should also be taken into account: sites for storing, formulating, or manufacturing pesticides, or sites used for the final disposal of wastes from these activities.

National Stockpiles Inventory

Taking into account data of pesticide imports into Uruguay included in the Stockholm Convention, it is estimated that no great volumes of stockpiles have been generated from such products.

Nevertheless, the project developed an inventory of stockpile pesticides in the country, aiming at all chemicals and wastes under this classification.

Data collection was aimed at institutions and companies which may eventually have or store stockpiles, or may know of their existence in their area. The inventory made in 1998[4] was available as background information, as part of a global FAO programme.

The following actors were consulted:

- Manufacturers, importers and formulators of pesticides (registered companies).
- Pesticide application companies.
- Storage facilities and logistics operators.
- Farming companies involved in non-irrigated agriculture, rice, forestry, citrus growers, and horticulture.
- Cooperatives and Rural Development Societies, Rural Associations and Societies.
- Municipalities and Municipal Councils.
- Extension and Research Institutions.
- Public Ministries and Companies.
- Transport Companies.

A total of 232 consultations were made through a specially designed form, with at total of 113 responses (consultations were repeated in 46% of the cases), establishing personal and telephone contacts with technical staff and authorities in those sectors. Complementing this, sensitization and training activities were undertaken within the Contaminated Sites programme, talks were given on the subject up country. These talks promoted further awareness of the inventory, and made it possible to debate with and receive information from relevant local people.

When personal contact was made, the people consulted showed a great deal of apprehension in providing data and requested confidentiality on the information given.

As a result of consultations, six institutions declared having obsolete pesticides, with a total of 20 tonnes located mainly in public institutions. The largest stock was that of 8 tonnes of gammexane (gamma-HCH) which has been in a deposit for at least 30 years. With regards to POPs, a stock of 400 litres of DDT was detected. Donated or abandoned products accounted as the main causes of the generation of this stock.

Despite estimations that stockpile pesticides in Uruguay do not amount to a significant volume, it is assumed that information gathered in the framework of this project is highly uncertain, due to undeclared stock. Owners or people stocking such products show great distrust when having to declare them to the relevant

4 Carried out by Marcelo Bonilla, Agronomist, under the supervision of the main Officer for Plant Protection in FAO's Regional Office for Latin America and the Caribbean (FAORLC).

environmental authority. Our country does not have a legal framework that makes it compulsory to declare these stockpiles. There is no nationwide infrastructure for their treatment, nor defined mechanisms for pesticide elimination. This situation partly explains why such a high percentage of consultations were not answered. Precisely, towards the end of the inventory, the Municipality of Montevideo received different requests for the final disposal in sanitary filling of small quantities of obsolete pesticides which had not been declared.

Although they were not a subject of the inventory, nor was precise information available on the subject, it is possible that there are burying or dumping sites for stockpile pesticides and in general terms, sites contaminated by POP pesticides.

As regards waste related to the use of pesticides, farmers and cooperatives appear to be more concerned about the management of empty containers than about stockpile pesticides. This shows that it is necessary to tackle the subject of managing containers, but also that greater efforts should be made towards sensitization to the risks associated with stockpiles.

Existing deficiencies in the quality control of raw materials, and errors in production planning in the companies that import or formulate pesticides, may be a continuous and considerable source of stock generation. As an example, and after the inventory, an import of 8 tonnes of Endosulphan was detected. Upon verifying that the quality of this product was not suitable for the formulation process, it awaits a final destination. Table 3.20 shows a summary of the above-mentioned threats and related key aspects.

Table 3.20 – Summary of Threats and Key Aspects for a suitable management of obsolete pesticides.

Threats	Key
Generation of new stockpile pesticides	Promote better practices in importing, manufacturing and formulating companies, to minimize the generation of obsolete pesticides (adapting the systems for planning stocks and improving quality control)
	Determining criteria for stock management by companies and farmers and other smaller generators.
Eliminating stockpiles by environmentally unsound methods	Avoid the entry of stockpiles into municipal systems whose purpose is the final disposal of domestic wastes.
	Generate administrative instruments which facilitate environmental elimination and control on the part of authorities.
Insufficient legal regulations to improve management	Determine technical criteria and administrative procedures; responsibilities in managing stockpile pesticides, criteria for environmentally sound disposal.
Insufficient information for taking decisions regarding stockpile pesticides.	Sensitize technical staff and decision-makers (government, key private sectors) regarding risks associated to stockpile pesticides.
	Develop and update records on pesticide stocks existing in importing, manufacturing and formulating companies, including management measures implemented for stockpile pesticides.

3.4.5 Unintentional Emissions

Characteristics of unintentional emissions

Dealing with unintentional generation of chemicals is a recent issue in Uruguay.

No analysis has been made of these pollutants in a systematic way, for emissions or for environmental, human or food matrices. This means that there is a lack of relatively immediate response capacity for information requirements that may arise from the different sectors. There are also voids and shortcomings in what refers to communication mechanisms with the population on the subject of dioxins and furans. These shortcomings add and contribute to uncertainty in society, which is sensitive to companies that may release such pollutants, especially with respect to the pulp bleaching mills and the incineration and co-incineration of wastes.

Furthermore, because there is no historical data on such environmental levels, it is not possible to know the trend in time for unintentional POPs in Uruguay.

During the Plan development stage, few studies on unintentional generation of pollutants have been produced:

- Measuring dioxins, furans, hexachlorobenzene (HCB), PCB markers and dioxin types in the eggs of hens raised in an area close to clinker producing furnaces. This study was carried out at the beginning of the year 2005 by the POPs Elimination Network (IPEN). The sampling was carried out by REDES-AT and RAPAL, and dioxin-type PCBs were the pollutants showing levels higher than study levels proposed by the European Union.
- Dioxins and furans measurements in the emissions of a clinker-producing plant at the company's initiative (year 2005).
- Dioxins and furans measurements in several matrices in order to calibrate immunoassays.

Incineration of hospital wastes is the only activity that has a limit to its emissions of dioxins and furans, determined by a national regulation (compliance controls have not as yet been implemented). This consists of Decree No. 135/99 which determines regulations for the management of solid hospital wastes, including emission limits for its incineration.

Despite the lack of knowledge about the population's exposure level to these pollutants, the people who can be identified as a group at risk are the ones living close to emission sources and the people who live in settlements. The latter are the ones at most risk, because of the intensity of their work in their living area: burning wastes rejected from recycling, burning cables and melting lead scraps, among others, added to the generally deficient sanitary and nutritional conditions.

The Toolkit for identification of dioxins and furans established by UNEP-Chemicals is used to estimate emissions of these pollutants in the country. No estimates are available on releases of PCB and HCB of unintentional production, given that measurements have not been taken and release factors are not yet available.

Uruguay made its first inventory of the release of dioxins and furans in 2002 in which the emissions of the year 2000 were estimated.

These figures were updated for the year 2002 and 2003, as part of the NIP project activities.

General factors of the main sources identified

At the data-collection stage of the Plan, the potentially emitting sources in the country have been identified, and their characteristics appear on Table 3.21.

Table 3.21 – Sources identified by activity

Activity	Sub-activity	Mode – Gaps – Applied Technology
Solid waste management	Urban solid wastes	The formal management mechanism is collection by the municipal cleaning service, to be disposed on the ground in different ways. These vary according to infrastructure and operations, and range from open-air dumps to sanitary fills. Rural population lacks home collection services. There is an important market for the recycling of waste and most of what is rejected is badly managed. Part of the population, particularly in suburban areas and despite having collection services, burns waste in the open air or dumps it into public areas. The value of organic residues for the production of compost is growing. Flaws in regulations, control, infrastructure and information result in unsound practices such as: burying waste, open-air burning and dumping into water courses and in public areas.
	Farm wastes	There is no management mechanism available for farm wastes. These are significant given the importance of farming in Uruguay's economy. Part of farm residues are burned in the open air, part remains on the ground and another fraction is destined to different value-added operations, such as employment as alternative fuel or production of biodiesel. Wastes which are burned in the open air are part of those generated by rice, sugar cane and wheat crops for sanitary reasons. One aspect to bear in mind is that there is a growing trend towards valuing wastes, which is reflected in the development of projects for those purposes.

Table 3.21 – Sources identified by activity

Activity	Sub-activity	Mode – Gaps – Applied Technology
Solid waste management	Solid hospital wastes	Their management is regulated. Alternatives to treatment are incinerating in authorized locations or autoclave processing with live steam for its subsequent disposal in sanitary fill. There is a trend towards an increase of the volume managed through autoclaves to the detriment of incinerated volumes. Furnace technology and treatment systems for gas emissions of installations authorized to incinerate these wastes do not contemplate satisfactory measures for reducing dioxin and furan emissions. Incineration of a small fraction of hospital-type wastes in the furnace where animal remains are burned has been detected because of non-classification by the generators.
	Animal remains	Identified methods are burying, open-air burning and burning in a furnace which operates in unsuitable conditions and whose inadequate emission treatment system is not operating.
	Human remains and wastes	Cremations are carried out in municipally-run furnaces. They operate in regular conditions and lack a system for treating emissions.
Industrial sector	Metallurgic industry	In Uruguay, the metallurgic industry is based on the secondary processing of metals from scrap. Production has decreased sharply in the last few decades, and several very small and medium-sized companies continue to operate. These companies have not updated their production systems and work in very precarious conditions. Larger companies concentrate an important volume of production and work force and in some cases, although production technology may be adequate, there is no integrated management system for the wastes generated. Production of steel, aluminium and copper are highly important. The lack of regulations, controls and the added value of inputs and wastes of the sector, favour the following aspects: • Strong informal component in waste management. • Disposal on grounds that are unsuitable, presenting a risk for the population settled at the old dumps. • Disposal in municipal landfills or dump sites which are not suitable for this type of waste. • Collection of possibly polluted scraps in unsuitable conditions and sites. • Stealing cables from the public network and open-air burning. • Lead-melting in precarious conditions on a domestic scale.
	Clinker production	There are three plants for clinker production with a total of five furnaces. Two of them are managed by the state through the National Administration of Fuel, Alcohol and Cement. In the last two years, production has fallen due to a recession period in the construction sector. However, recovery is expected in the future, in addition to the projected installation of a new plant. Three of the furnaces operate by dry process and have a gas emissions treatment system, one of them has technology which tends to the best available. The remaining furnaces are operated by wet process and at present with little or no system for the treatment of gas emissions. For these, the installation of a furnace filter for a furnace that has no treatment system and a change of filter in the other furnace, are foreseen in the future. Some residues with energy value are used as alternative fuel in the ovens: rice husks, used motor oil and the oily phase of sewage waters.
	Lime production Production of ceramics	Lime production is carried out in four furnaces, which have no system for gas emission treatment or whose systems are not operating. Most ceramic production is concentrated in one company and all production is carried out without treatment of gas emissions.
	Brick production	Most brick production is carried out as a cottage industry, in furnaces operating in deficient conditions and with no system for treating emissions. Some employ several kinds of wastes as fuel: plastic containers, tyres, among others. There is no record of the number or location of these industries.
	Production of asphalt mixtures	Production of asphalt mixtures is carried out by companies in different situations. Part of the production is carried out with gas emission treatment systems; although in some companies, such systems are not fully operative and other companies lack a treatment system or it has not been possible to identify the operation mode.
	Pulp and paper production	Within the industrial category, it is the only activity identified with the possible generation of effluents polluted with dioxins and furans. A very significant increase in the production of bleached pulp is foreseen. The only company which at present produces bleached Kraft paste is of medium size and it plans to reconvert its production system from elementary chlorine to one that is totally chlorine free in the short term. The installation of two bleached Kraft pulp mills is foreseen; these mills will have a total production volume of 1.410.000 tonnes per annum, with bleaching based on chlorine dioxide. Production techniques, according to the IPCC, would be among the best available. There are other plants in the country which produce paper and non-bleached pulp, with recycled paper being a production input. In some cases there are no systems for the treatment of effluents and/or the generated wastes are not suitably managed. The use of wood for energy in the paper sector corresponds to approximately 18% of the total use for the industrial sector.
Energy generation	Energy demand per source (final consumption)	Final energy consumption for Uruguay was stable between the years 1970 and 1990. It showed a growth trend up to 1999 and then began to decrease in the year 2000. For the year 2003, use was of 2176 kt of primary energy (ktpe), demand by source corresponds to: petrol by-products: over 55%, electric energy: 24%, biomass consumption (90% firewood) 20%. Electrical use increases as of 1990 (except for a slight decrease in the last few years) while total biomass consumption has decreased since the year 1992. The use of firewood for the homes sector has not been updated since the year 1998. Consumption by power utility itself, which corresponds to the energy used for production, transformation, transport and distribution of energy corresponds to 98 ktpe for 2003.
Forest Fires	Forest fires are recorded by the National Fire Brigade. In Uruguay, reasons for spontaneous fires are generally imprudence and lack of land maintenance. These fires increase in both intensity and frequency during droughts.	

Unintentional emissions estimate

Total emissions in the country in the forms of releases taken into account in the Standardized Toolkit, air, water, soil, wastes and products, are estimated for the year 2000 at 28 g TEQ (Toxicity equivalents). When updating the inventory for the years 2002 and 2003, total emissions are estimated at 55 and 49 g TEQ respectively.

The Toolkit has been used given the lack in the capacity to take measurements. Despite its limitations, it is a useful tool to obtain dioxin and furans at country level.

The emissions of the year 2000 have been recalculated on the basis of Toolkit modifications and of assumptions employed for updating. These would amount to 53 g TEQ.

Table 3.22 details the results of estimates per category according to the classification proposed by the Toolkit. In it, releases from industrial wastes are included within the sector generating them.

Table 3.22 Total releases per category for the years 2000, 2002 and 2003

Nº	Source category	2000[a]		2002		2003	
		(g EQT/a)	%	(g EQT/a)	%	(g EQT/a)	%
1	Waste incineration	4,8	9	0,6	1	1,0	2
2	Production of ferrous and non-ferrous materials	2,9	5	3,3	6	3,1	6
3	Generation of energy and heat	2,3	4	2,4	4	2,3	5
4	Production of mineral products	1,0	2	0,9	2	0,6	1
5	Transport	1,4	3	1,4	3	1,3	3
6	Uncontrolled combustion processes	33,1	62	37,4	68	31,4	65
7	Production of chemicals and consumer goods	2,0	4	2,4	4	2,5	5
8	Miscellaneous	0,02	0	0,1	0	0,1	0
9	Disposal / sanitary fills	5,8	11	6,2	11	6,3	13
	TOTAL	**53**	**-**	**55**	**-**	**49**	**-**

[a]: values recalculated for the year 2000.

Total emission of dioxins and furans estimated in the three years do not have relevant variations and there are no significant changes in percentage contributions of each category, except in waste incineration. Within this, in the years 2002 and 2003 there was a decrease of managed hospital waste by incineration, increasing the volume that is treated in autoclave and subsequently disposed of in sanitary fills, this is reflected in a decrease in the contribution of releases for such category.

Applying the Toolkit methods, the contributions to air, soil, water, waste and product estimated appear in Table 3.23, for the year 2003.

Table 3.23: Contribution of each category per release way, 2003

	Annual Release (g TEQ)				
Source category	**Air**	**Soil**	**Water**	**Waste**	**Products**
Waste incineration	1.0	-	-	0.01	-
Production of ferrous and non-ferrous materials	1.4	-	-	1.7	-
Generation of energy and heat	1.9	-	-	0.3	-
Production of mineral products	0.5	-	-	0.3	-
Transport	1.3	-	-	-	-
Uncontrolled combustion processes	12.4	1.2	-	17.7	-
Production of chemicals and consumer goods	0.0	-	0.1	1.4	1.4
Miscellaneous	0.1	-	-	0.00	0.00
Disposal / sanitary fills	-	-	0.4	5.6	0.18
Total	18.7	1.2	0.6	26.8	1.2
% of total	39	3	1	55	2

The uncontrolled combustion processes category is the highest, with over 60% of total emissions for recorded years. Within it, the burning of domestic waste involves 80% and the burning of agricultural waste 12%. It is important to point out that these processes are the ones presenting greater uncertainty in the data for amount of material burned.

Wastes are the main release vehicle, with 55% of emissions in the year 2003.

Direct emissions into the environment through the release vehicles: air, water and soil, represent 21 g TEQ/a (43% of the total). This fact highlights the importance of solid waste management, since suitable conditioning would make it possible to control the risk associated to 55% of the release of the country's dioxins and furans. Of these direct releases into the environment, 66% are due to uncontrolled combustion processes.

With regards to possible sites contaminated with dioxins and furans or their precursors, what has been mainly identified is the use of 2,4 D herbicide and the employment of pentachlorophenol and its derivatives in the treatment of wood and the use of PCB in electrical equipment. 2,4 D herbicide is commonly used in Uruguay, while pentachlorophenol and its by-products have been broadly used in the past, and are at present only in limited use. At this data-collection stage of the survey, it has not been possible to exhaustively identify sites which may be polluted by these compounds

With regards to the projections of emissions of dioxins and furans, while measures are not implemented for their reduction, no significant short-term changes in release levels are foreseen, except for sectors producing pulp or paper. The installation of two large pulp mills is foreseen: the production of bleached kraft pulp would go from 30,000 to 1.440.000 tonnes per year. In addition to potential release from the new plants, variations are projected due to the intended change in technology in a paper mill which is already installed and would change to chlorine-free technology at the bleaching stage.

An increase of 34 g TEQ would therefore be reported, which would represent an increase of about 70% with regards to total release for 2003. More than 80% (28 g TEQ) of the increase would correspond to emissions of waste coming from the recovery of products from the burning of black liquor and 17% would be due to releases from burning bark waste.

These projections are carried out using the Toolkit updated to May 2003. The latest update, available in February 2005, has determined changes for the release of these two wastes; in this result, the projected increase is virtually none.

This makes it necessary to go deeper into the subject at a national level, given that their relevance justifies measurements of dioxins and furans in these wastes despite the implementation of suitable conditioning. This will make it possible to decide on their inclusion in the release inventory.

Key aspects identified

Knowledge and surveillance ability status

Technical capacity for the control and surveillance of unintentional release is limited because of the following reasons:

- The State lacks response capacity given the high cost of sampling and analysis of dioxins and furans.
- There is no capacity in the country for the sampling of gas releases, or for the analysis of dioxins, furans and PBC-type dioxins.
- No sector is required to monitor unintentional releases of POPs, since there are no national regulations on the subject, except for the incineration of hospital wastes, an activity which does not perform its own controls.
- It is necessary to train technical staff in charge of the evaluation and control of companies with regards to technologies and releases of these pollutants.
- It is also necessary to train human resources in the sampling and analysis of unintentional generation of POPs.
- There are deficiencies in the management of industrial, farm and home wastes.

- There is no thorough record of all the industrial activities within the country.
- The level of informality in some activities is very significant.

There are some aspects which contribute favourably to the implementation capacity of measures tending to reduce releases:

- A working group has been implemented which integrates the "cleanest production table", constituting a suitable point for the implementation of clean production technologies.
- There is a technical proposal for the regulation of the integral management of solid industrial, agro-industrial and service wastes. Approval of these guidelines is foreseen for 2006.
- A favourable approach has been achieved with the industrial sector, with a view to beginning work tending to implement clean production technologies and to determine regulations for the release of dioxins and furans into the air.

Priority sources identified

The following sources were identified at the data collection stage as the priority sources for actions tending to implement the Plan:

- ***Uncontrolled combustion processes***
  - Burning domestic wastes in the open air.
  - Burning farm waste in the open air.
  - Burning cables in the open air.
  - Forest fires.
- ***Waste management in general***
  - ***M***anaging sites for the disposal of urban solid wastes.
  - Managing solid industrial, agro-industrial and service wastes.
  - Informal activities concerning waste management.
- ***Thermal processes of the industrial sector***
  - Metallurgic sector:
  - Production of non-ferrous metals:
    - Aluminum production.
    - Copper production.
  - Production of ferrous metals:
    - Steel production.
  - Production of minerals:
    - Cement production.
    - Lime production.
  - Incineration of hospital wastes.
- ***Domestic heating and cooking with biomass.***
- ***Chemical production processes:***
  - Production of cellulose paste and paper.
- ***Energy generation***.

Evaluation of Exposure risk

Measures tending to reduce exposure levels require an integrated approach which makes it possible to approach aspects related to primary pollution sources, as well as ways of exposure.

Studies carried out by the international community have shown that the main type of population exposure to unintentional emissions of POPs is through food. Due to the lack of national information, it is assumed that the main way of exposure in Uruguay could also be foods and that the unsound management of waste may also be a significant way of exposure, mainly for the population that is directly linked to unsound management activities.

A large part of Uruguay's economy is based on farming production, this reinforces the need for an evaluation of the levels in environmental matrices and in foods and feeds. Knowing the relevance of possible ways in which pollutants are transferred and the population's degree of exposure are key aspects. Foreign foods which are part of the Uruguayan diet should also be included in this evaluation.

Periodic determination of the degree of exposure also makes it possible to know the efficiency of the actions determined in the Plan and the possible need for additional measures.

3.4.6 PCB

The Stockholm Convention determines specific guidelines for Polychlorinated Biphenyls (PCBs) with respect to the identification, management and elimination of stocks, putting Party countries

under the obligation to eliminate the use of PCB in equipment, or any stock of PCBs, before 2025.

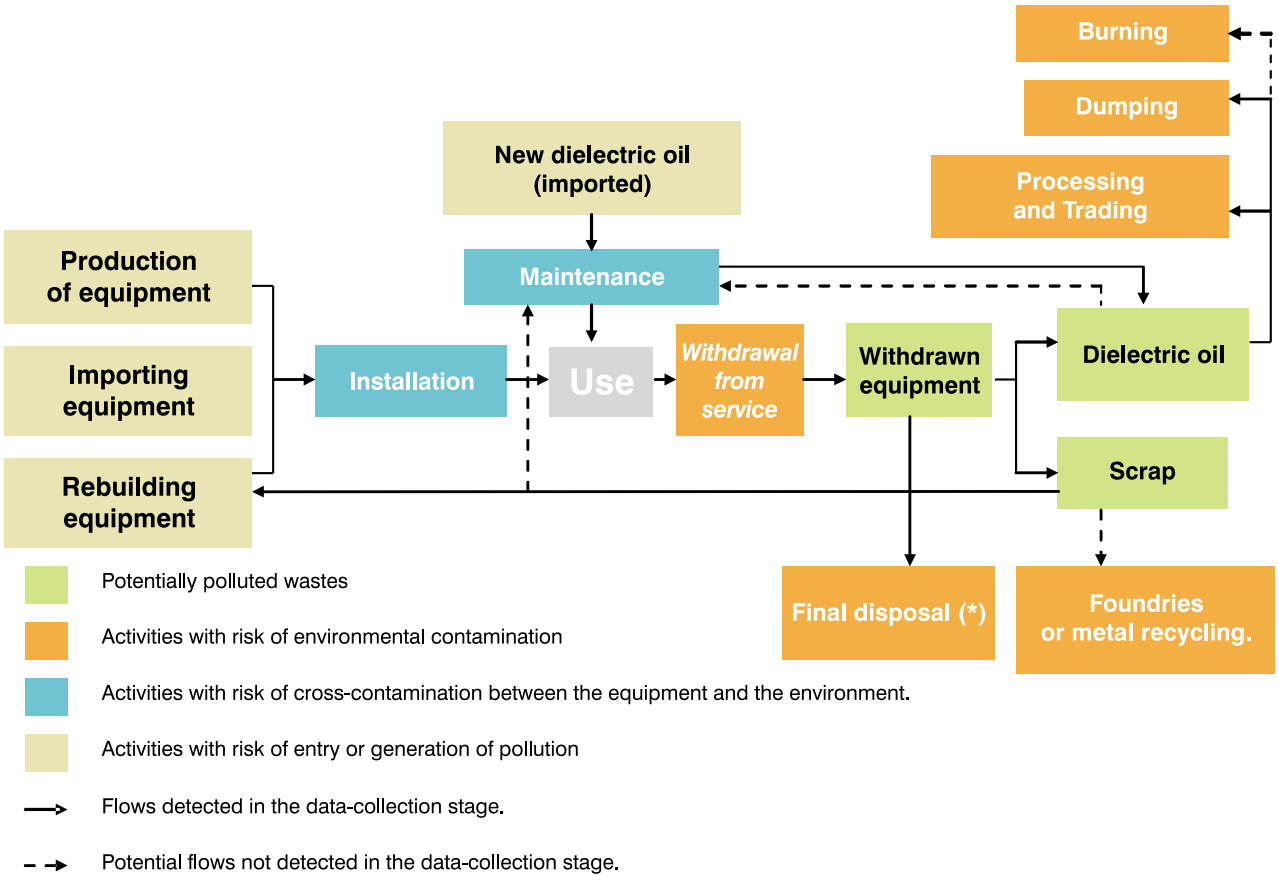
Excluding unintentionally generated POPs, PCBs are the only substances included in the Stockholm Convention which are used in the country, and whose entry into the country and trade has never been regulated. Within the possible uses, the one which is most relevant to Uruguay is its use as dielectric oil in transformers. Because of this, during the Project's development, the analysis of the national situation with regards to PCBs emphasized this particular use.

In order to improve knowledge on the use and stocks of PCBs, a **diagnosis of the national situation** was carried out for the following areas and subjects:

- Identifying import volumes and importing companies for electrical transformers and dielectric oil.
- Identifying manufacturing companies, installation, maintenance and withdrawal from service of electric capacitors and transformers.
- Analysis of management systems and ways of operating and treatment which are at present applied for such equipment by the utility company that generates, transmits and distributes electricity (UTE).
- Implementing the collection of data for other stock, requesting information from owners of transformers (not belonging to UTE).

The diagnosis was based on gathering information on the life-cycle and the potential flow of equipment and dielectric oil, which could be potentially polluted with PCB, which is set forth in Diagram 3.3.

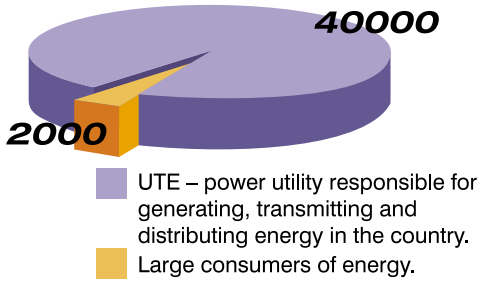
Diagram 3.3 Life cycle and potential flow of the equipment and dielectric oil.



As illustrated in Diagram 3.4, it is estimated that 42,000 transformers exist and are operating in Uruguay. Of these, 95% belong to UTE and the remaining 5% belongs to some 500 small and medium-sized companies that consume energy in medium and high voltages (it is estimated that each one has between 1 and 5 transformers).

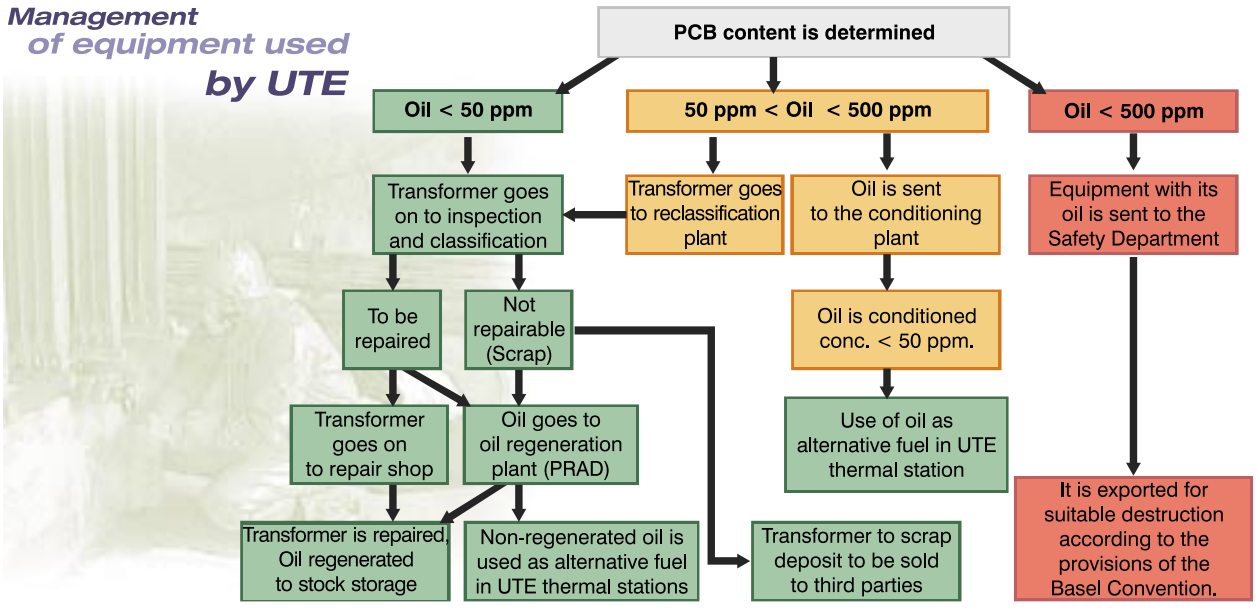
With regards to equipment belonging to UTE, the company applies a management system for dielectric oil and equipment polluted with PCB which is supervised by the Environmental Deputy Management Office.

Diagram 3.4 Distribution of Transformers



According to the application of internal regulations, since 1997, new equipment purchased is verified to be "PCB free". They are considered "PCB free" when the concentration of these oils is less than or equal to 2 ppm. Furthermore, the analysis of PCB concentration in high capacity transformers destined to generation and transmission, as well as for each equipment which is withdrawn from service for maintenance or replacement has been undertaken. Nevertheless, there are a large number of transformers in the population's distribution network (some 36,000) which have not been monitored because there are not enough resources in the country to carry out this evaluation within a reasonable time frame (human resources and laboratory capacity to supply demand). Diagram 3.5 shows a flow chart of the plan implemented by UTE for the management of the dielectric oil in its transformers. There are similar management plans for capacitors, current interrupters and circuit breakers containing dielectric oil.

Diagram 3.5 Flow chart of the plan implemented by UTE for the management of dielectric oil in its transformers



From the data collected, it can be pointed out that 35% of transformers in use are manufactured in the country, and two manufacturing companies were identified as currently operative. Both companies have procedures to verify the use of PCB-free dielectric oil. From the information gathered, it was revealed that the national manufacturers of transformers have not used PCB as dielectric oil.

Several companies dedicated to the installation, maintenance and withdrawal from service of electrical equipment have been identified.

However, most of them do not have procedures for analyzing oils or rejecting polluted oils. On the basis of this information and analyzing the operation of transformer maintenance companies, it is estimated that an important proportion of transformers being used may be polluted with PCB as a result of unsuitable management practices of dielectric oil during such operations.

In what concerns waste management, it is important to point out that Uruguay does not have the necessary infrastructure installed for the treatment or elimination of wastes which are polluted with PCB. Because of this, UTE has exported equipment and "PCB pure oils" (concentration of PCBs higher than 500 ppm) for their destruction in the European Union, and it has a second export consignment in process. In addition to being expensive, these elimination processes are slow and complex, because there are no facilitating mechanisms for export logistics.

It is estimated that most of the equipment polluted with PCB have a concentration which is lower than 500 ppm, for which their exporting would not be viable due to the high costs involved in such operation. UTE has temporarily determined that these oils will be conditioned in the Central Batlle (thermoelectric station operated by UTE), up to concentrations lower than 50 ppm, and their use as alternative fuel, it is necessary to go deeper into the environmental assessment of this operation.

Finally, and despite the fact that there was no thorough investigation, there is the possibility of the existence of environmental liabilities consisting of abandoned equipment belonging to bankrupt companies and sites contaminated with PCB generated by the release of dielectric oils during their use or maintenance, manufacturing or final disposal of the equipment containing them.

As a result of the evaluation carried out by the Project in this area, the following key aspects are highlighted:

- UTE's management system does not include the whole of their equipment. It excludes transformers in transmission lines and low-voltage distribution equipment operating (36,000 small transformers). This system does not include equipment belonging to other owners. Thus the need to make a more thorough inventory of stock, which allows for the traceability of equipment and PCB polluted oils.
- In addition to this, it is difficult to estimate the volumes of other electric equipment which may be contaminated with PCB (capacitors, starters and circuit breakers), as well as determining their location and how they are managed at present, because there is little information about their use and history.
- These information voids are the result of a lack of human and financial resources of the State to carry out a thorough inventory of the stock of equipment, materials and oils polluted with PCB.
- The possibility that dielectric oils which are withdrawn from use are managed and eliminated in an environmentally unsound way, through dumping in the sewage network, or their recycling as lubricants for leather, use as lubricants for machinery, or preparations for treating wood has been detected. The likeliness of such destinations increases when the dielectric oil enters circuits set up for recycling other used oils such as lubricant oils and cutting fluids.
- One of the threats of the void in regulations for PCB is that until now, no conditions have been determined about the PCB content in imported equipment with dielectric oil. This aspect might be more relevant when importing used equipment, because their age means that it is more likely that they be polluted with PCB.
- Stock elimination is a huge challenge for the country, because there is no infrastructure for this purpose, and because of the high costs associated to the destruction and decontamination of equipment and polluted oils. To these are added the complexities involved in export paperwork of polluted materials. The alternative of the co-incineration of oils with less than 50 ppm of PCB in the Central Batlle, is an option which must be evaluated from the technical, social and economic points of view.

- The fact that the public company which owns 95% of the transformers in the country has a management system by which it has set out procedures for maintenance and withdrawal of equipment from service, minimizing exposure risks for workers and preventing cross-contamination, is identified as a great strength.
- There exists in both public and private actors an acceptable sensitization level about the risks associated with PCBs which favor actions in proposed management improvements. Nevertheless, greater sensitization efforts aimed at the population in general are necessary, as is the training of directly related populations, particularly workers potentially exposed to PCBs.

Table 3.24: Summary of Threats and Key Aspects for appropriate management of PCBs

Threats	Key Aspects
Incomplete or insufficient mechanisms for the identification of PCB-polluted equipment	Monitoring of PCB in dielectric oils and material or equipment containing such oils: strengthening national capacities for monitoring and designing and implementing monitoring plans equipment belonging to UTE and other owners.
	Identification of other equipment polluted with PCB (capacitors, starters and circuit breakers).
	Implementation of a stock traceability system.
Insufficient regulatory instruments for management	Specific regulations for the management of dielectric oils and equipment that contains them, including aspects related to their life cycle and deadlines for stock elimination.
	Additional regulations which include other materials polluted with PCBs.
Pollution risks in maintenance operations	Procedures for maintenance operations of transformers and management of other equipment and materials potentially polluted with PCBs. y materiales potencialmente contaminados con PCB.
	Authorization and registration of manufacturing and installation companies, as well as those doing maintenance on or withdrawing from service equipment with dielectric oil.
Unsound management and disposal of equipment withdrawn from service and dielectric oil.	Registration of scrap companies to avoid unsuitable management of transformers and other equipment potentially polluted with PCB.
	Exchange plan for transformers and capacitors according to identified priorities, taking into account the country's situation and the development of capabilities.
	Regulation for the management of used cutting fluids and lubricants.
Lack of a national infrastructure for the environmentally sound treatment or disposal of wastes contaminated with PCB.	Technical-social and economic evaluation of alternatives for final disposal and treatment of wastes polluted by PCB.
	National capacity in human resources and infrastructure for treating PCB-polluted wastes.
	Eliminating stock according to the selected priorities and technical alternatives.
	Coordination of the necessary procedures to export PCB-polluted materials for their treatment abroad.
Risks to human health and the environment associated to sites possibly contaminated by PCBs	Identification, characterization and a management plan for PCB-contaminated sites.
	Implementation of preventive measures for the management of PCB-contaminated equipment until they are retired from service.
Insufficient capacity in institutions and companies for the suitable management of PCB-contaminated equipment.	Sampling and analysis capacity of PCBs in different matrices and extension of the alternatives for sampling and analysis aimed at key sectors
	Capacity for the control norms for solid residue regulations, for PCBs and management of used oils.
	Institutional agreements allowing sustainability and execution of the elimination plan for PCB-polluted residues.
	Sensitization and training of identified key actors.

3.4.7 Contaminated sites

Situation

Several human activities have generated sites contaminated[5] by POPs and other persistent toxic substances. These entail significant risks for human health and the environment when they are not adequately used and the necessary measures to minimize or mitigate these risks are not implemented. Although serious problems are not detected in a contaminated site, changes in its use, or transport of pollutants to neighbouring

5 The following definition was adopted: A site is considered contaminated when there is an accumulation of persistent toxic substances or wastes containing them caused by the use, storage, burying, and filtration or dumping in a planned or accidental manner, causing an increase in their concentration in soil and/or ground water above the recommended safety levels for a specific use.

areas, surface waters, or towards ground waters may derive in significant environmental damages. Soil pollution entails a loss in the ability to use the resource and an obstacle to urban planning and development.

Following a widespread global trend, environmental policies and social concerns in Uruguay have given priority to the protection of surface water resources, understating actions concerning prevention and suitability of soil pollution. For this reason, at the beginning of the Project there was not enough information for the designing of a suitable management proposal and the following significant voids were identified:

- There are no government programmes for the identification, evaluation, and recovery of contaminated sites, and private initiative is very limited.
- There are no specific legal regulations for the management of contaminated sites, which is necessary mainly to define acceptable risk levels for human health and the environment and to allocate responsibilities for site management.
- There are important needs in what concerns sensitization and training, both in the government and in key private sectors.
- Relevant institutions do not have enough capacity (human and material resources) and need to adapt them to internal structures to work in a planned and coordinated manner.

The described scenario reached a critical point in 2001, when it was discovered that some residential areas en Montevideo were located over old metallurgical industry waste dumps, or settled on abandoned industry sites. The discovery of children with high lead levels in their blood, and the public alarm this caused, placed soil contamination and environmental liabilities among the main subjects for discussion, both in public and in private sectors. In response to this, DINAMA developed a project to identify and mark sites associated with metallurgic activities, tanning and industrial dump sites at locations up country. In the same manner, the Municipality of Montevideo began to undertake pollution studies of the department's soil, and work continues, mainly on irregular settlements.

With this background, at the beginning of the Project, it was deemed necessary to carry out an inventory in an organized and systematic way of all potentially polluted sites in all national territory associated to POPs of the Stockholm Convention, including other hazardous substances as well. Selection of substances to be considered was based on different parameters: extensive use of the country's productive activity, its characteristics as serious soil pollutants and the interest shown by society. As a result of this analysis, heavy metals and other toxic and persistent organic chemicals were also included. Under this framework, an inventory of potentially contaminated sites was made up, basically taking into account DINAMA's record of industrial activities, to which data from other public institutions, the academic sector, and municipal governments, among other sources of information, were added.

At present, this information is contained in a database which is a key tool for the management of contaminated sites in Uruguay, since it allows for the constant updating of information, priority definition and decision-making on each of the sites.

As can be seen on Diagram 3.6, 353 potentially contaminated sites were identified. These are mainly associated to industrial activities in the metallurgical, chemical and tanning industries, located mainly in the department of Montevideo.

This information will surely evolve, adding new sites, for example, as final waste disposal sites from inventoried industrial activities are detected. In fact, 1006 sites were studied, and there is little information for 447 of those, and they may be added to the list of 353 potentially contaminated sites[6]).

6 A potentially contaminated site is considered as such when there are sound reasons to believe so, for example if there have been activities on it that use, produce or release persistent toxic substance.

Diagram. 3.6: Potentially contaminated sites per activity (Total PPS = 353). The kind of productive activities in Uruguay means that most potentially contaminated sites are associated to heavy metals.

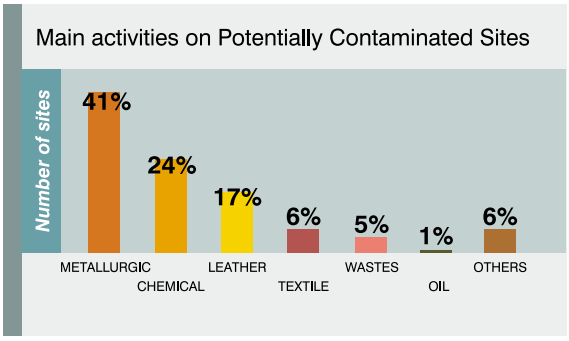
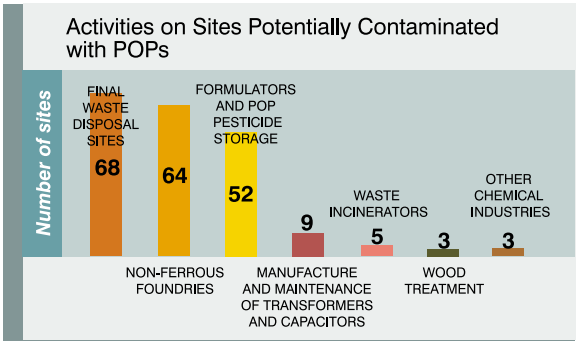


Diagram. 3.7: Activities developed on sites potentially polluted by persistent organic pollutants (Total PPS by POPs = 204). This number is subject to variations: as new sites are identified (mainly in the case of final waste disposal sites).



From Diagram 3.7, it can be seen that sites contaminated by POPs might represent an important percentage of the total sites (mainly associated to pollution by dioxins and furans). These are the main activities:

- Sites for final waste disposal: municipal or informal dumps. Since there is no infrastructure for the elimination of industrial wastes, these have been disposed of together with domestic waste.
- Formulation plants and POP pesticide storages. Most of these activities were not subject to environmental control. The record for these activities is the entry of 264 tonnes of Aldrin, Endrin, Dieldrin, Chlordane, Heptachlor and Mirex, and there is therefore a high chance that these sites have been hit upon either by accident or by planning (burying or dumping of wastes).
- Plants for manufacturing and maintaining electrical transformers and capacitors. In this case, it also involves activities which have not been subject to environmental control, and there is a chance of PCB pollution.
- Wood treatment: use of pentachlorophenol as a wood preserver, a product which may be potentially polluted with dioxins and furans or a precursor thereof. It is believed that a much higher number of this kind of site exists, but because in some cases they are small sawmills or informal companies, or companies not in continuous activity, they are extremely hard to find.
- Non-ferrous foundries: Secondary foundries of lead, copper, bronze and tin, which in general have the same informality traits described above. They are associated to POPs because they are an important local dioxins and furans generation source.

Sites potentially contaminated by POPs are regarded as priority action areas, taking into account the inherent danger of such pollutants. Nevertheless, it is necessary to consider other specific aspects of each site, such as potential human and ecologic receptors, for determining priorities.

Concerning the need for immediate action on this subject, there are opposing factors such as scarce infrastructure and human resources in public institutions with capability on the subject: Ministry of Housing, Use of the Land and the Environment, Ministry of Health and Municipalities. Sensitization and training activities have already been developed during 2004 (within the NIP framework) through five regional workshops aimed at technical staff and representatives of local governments and spokespeople in the environment and health areas for each community, where the demand for information on the subject was explicit, as well as the need for further training efforts. In order to meet these demands, a “Guide for the Identification and Preliminary Evaluation of Potentially Contaminated Sites” was written, a basic document to develop the first stages of contaminated site management, aimed at technical staff from local and national local government organizations, advisors for activities which may be potentially polluting and other interested parties.

To the above-mentioned shortcomings, is added the need for a debate with key actors. Such a debate is necessary to determine regulation criteria which are absent today on pollution and determination of levels or standards of pollutants in the soil and ground water. Certain mechanisms which have already been determined in existing or proposed regulations may be useful for the management of contaminated sites. Examples of these mechanisms are set forth in the Environmental Impact Assessment Law, or in the proposal for the regulation on industrial, agro-industrial and service wastes. These instruments are very useful to avoid the generation of new contaminated sites, but approaching conflictive and highly complex aspects (such as the responsibilities of owners and State in such management) requires that special legal regulations be developed.

In relation to the unsuitable use of sites, there is the beginning of a trend in Montevideo to recycle industrial venues for commercial or residential use, but without the necessary evaluation of their environmental conditions (which is not at present a legal requirement for businessmen). Vacant industrial areas (or "brownfields", according to the internationally used term), have increased considerably in the last 20 years, due to a deep change in the national industrial sector. These areas, until the 90s, took up an area larger than 14 hectares in Montevideo (counting only 70 vacant areas with a areas over 0.5 hectares).

A necessary evolution towards suitable management of contaminated sites is their integration to plans and policies for the use of the land. Rehabilitation of such land must not only intend to correct present situations by decreasing risks from an environmental perspective, but also to revalue the sites, giving back to the soil its capacity to be used, reintegrating them to the economic cycle. For this reason, contacts have been made and sensitization activities been undertaken with the construction sector, the real estate sector, social programmes in housing, and also local and national land planning authorities, including them in the proposal for the rehabilitation of vacant areas in Montevideo.

It is also known that some sites for domestic and industrial waste dumping constitute areas of opportunity for setting up irregular settlements. In the last ten years, there was an annual growth of 10% in these settlements in "free" or opportunity areas. The population of such areas is vulnerable due to their extremely fragile economic, social and health situation. This is another threat posed in the medium term, and was approached within the NIP by assisting the Irregular Settlement Integration Programme (PIAI). Environmental identification tasks were undertaken for settlements where regularization was projected, and proposals for modifications to these projects have been made to prevent and minimize health risks for their inhabitants.

Taking into account that 40% of potentially contaminated sites are related to activities which are still operative, it is essential to tap into this strength, mainly linked to the easy identification of the person responsible, to implement management plans for such sites, promoting self-evaluation and self-management of environmental liabilities. A process of this type begun in two industries; and the remediation of one of them (an old plant for formulating POP pesticides) was completed. In application of the principle of "whoever pollutes, pays", it is necessary to carry out the task of calling on and following up with the people responsible, determining technical criteria and even a specific framework of regulations which enables environmentally sound investigation and remediation processes.

Even for complicated cases such as "orphaned sites" (where those responsible for polluting no longer exist or cannot respond), opportunities in improvement can be seen, and it is vital to look for existing mechanisms or develop economic instruments that allow for their environmentally sound management. Contaminated sites are a legacy from a time when the soil was regarded as an infinite receptor of pollutants and residues. In the light of the damage that these unsuitable practices have caused, it is necessary to stop those that still carry on, and to begin to correct those which pose greatest urgency or priority. Table 3.25 shows a summary of threats and key associated aspects, which were mentioned above

Table 3.25 Summary of threats and Key Aspects for sound management of chemicals.

Threats	Key aspects
Generation of new contaminated sites	Improving the management of agro-industrial and service wastes.
	Improving the management of domestic waste: informal activities for collection and classification, and municipal systems for final disposal.
	Implementing measures for preventing or mitigating soil pollution in new sites of industrial and service activities.
Unsuitable uses and changes in contaminated sites	Avoid irregular settlements on waste-filled areas or inactive industrial areas.
	Carry forth a sound environmental description and subsequent remediation when a change in the use of inactive industrial sites is planned.
Insufficient management capacities	Improve analytical capacity, as well the capacity to identify soil, waste and water pollutants.
	Train human resources in the competent institutions and in key private sectors.
	Allocate economic resources and define technological activities for remediation.
Insufficient legal guidelines for management	Determine technical criteria and administrative procedures: define acceptable risk levels for the environment and for human health, risk definition and evaluation criteria, define responsibility for the management of contaminated sites.
Insufficient information for taking decisions related to contaminated sites.	Sensitize technical staff and managers to define policies and take decisions (government, key private sectors) with regards to the risks associated to contaminated sites.
	Generate and update records on potentially contaminated sites, and on activities on contaminated sites.
	Promote research activities in the academic and private circles which will generate suitable technologies to help define and remedy contaminated sites.

3.4.8 Information and Sensitization

Sensitization and awareness process on POPs and other chemicals.

In order to change behaviour and practices to achieve the environmentally sound management of chemicals, it is necessary to consolidate knowledge in the population through the implementation of specially designed communication strategies.

Communication strategies are distinguished for being preparation processes for people to acquire the necessary knowledge to prevent the risks associated to substance management and to understand the dimension of the problems involved and the solutions available, taking into account existing means and tools. They should also tend towards achieving a change in behaviour of the public at which the campaigns are aimed.

At the beginning of this project, the need to implement a sensitization and awareness programme was identified, in order to achieve the following objectives:

- Gain awareness and sensitivity on the subject of POPs and problems concerning them.
- Acquire different experiences regarding these POPs and a basic knowledge of them.
- Acquire a set of values and a sense of responsibility, as well as motivations to adopt good practices of use, take an active part and thus secure attitudes for the improvement and protection both of the environment and of human beings.
- Acquire primary abilities to identify and solve problems related to unsuitable uses of chemicals.
- Encourage people to get involved and take an active part in all work levels in order to seek solutions to environmental problems.

For this purpose, within the framework of the development of the National Implementation Plan, Uruguay developed and began an initial implementation phase of a communication, sensitization and training strategy.

The basic components of the communication strategy were the organization of sensitization and training workshops and seminars, in addition to gathering information which the population has on POPs through a form for identifying needs.

The strategy which was developed and implemented was aimed at two sectors: the formal education sector and civil associations. These were selected because they are excellent multipliers of the information and training they receive, in addition to being permanently in touch with large sectors of the population, especially

with sectors which are most vulnerable to risks associated with chemicals. A summary of the sensitization activities developed is included as Annex 3.

From the implementation of the above-mentioned activities and the analysis of forms, it was possible to determine the need to generate mechanisms and tools to improve access and quality of the information on POPs and their effects on health and the environment.

The results of the evaluations made in the sensitization workshops implemented appear in Diagrams 3.8, 3.9, 3.10.

Diagram 3.8: Need to obtain information on POPs and the environment

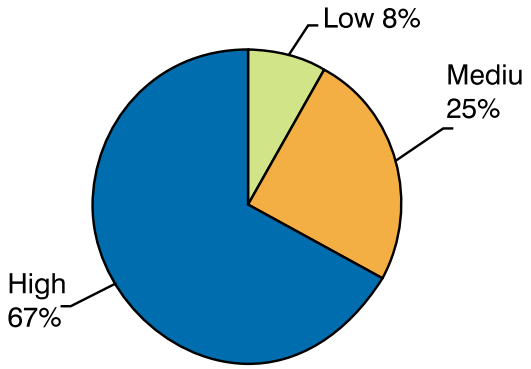


Diagram 3.9: Need to obtain information on POPs and health.

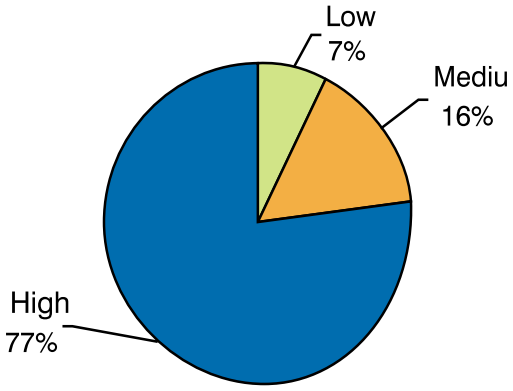
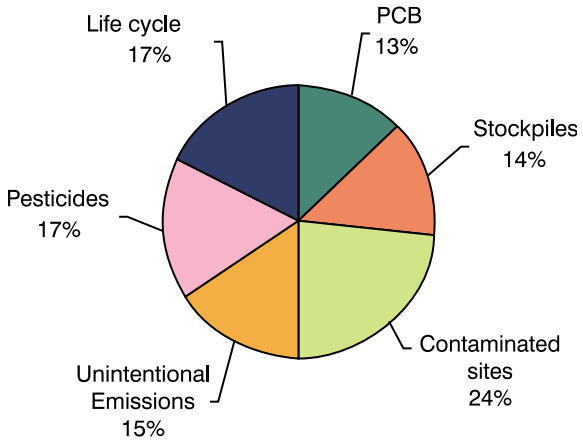


Diagram 3.10: Need to obtain information per subject area.



Civil associations

A key factor for the success in the implementation of environmental national plans is to achieve a high participation of the public, private and civil association sectors. Civil associations thus become key actors in the development of participatory mechanisms.

The universe of NGO organizations in Uruguay is wide and varied. This is its greatest strength, because of the diversity in their objectives, in their areas of work and in their technical staff.

NGOs may be grouped into two large categories according to their coverage and the subject matter they deal with. On the one hand, there is a group that works on social and/or economic areas and incorporates environmental issues indirectly; on the other hand, there are NGOs whose main work is specifically environmental.

A large number of the latter are grouped into two national Networks: The Uruguayan Network of Environmental NGOs and the National NGO Association (ANONG), which includes most of the NGOs working mainly on development. Together they involve some 150 organizations from all over the country.

During the implementation of the NIP Project, civil associations were represented through the inclusion of both Networks (ANONG and the Uruguayan Network of Environmental NGOs) in the National Coordination Committee.

The contribution of delegates from both groups in the NIP Project process, as well as those from Rapal-uy and Guayuvirá, was of great value for Sensitization, Awareness and Extension aspects of the Project.

In terms of the development of sensitization, research or training programmes related to POPs, there are few organizations working specifically on these subjects. Nevertheless, there are organizations which due to the area they work in, have an important relationship with problems associated with these pollutants and/or with the more vulnerable sectors of the population exposed to chemicals. An example of such organizations, the NGOs working on subjects related to the use of pesticides or whose work is centered on irregular settlements.

Such organizations are in permanent contact with the population, they are aware of the local situation and of its needs. Nevertheless, there is a need to improve the information level on different areas related to POPs in order to avoid risks and increase participation.

For this reason, it is essential to generate mechanisms so that civil associations can have access to key quality information on the national problems associated to POPs as an instrument to facilitate and strengthen their action.

Academic information

The purpose of gathering academic information during the NIP Project was to diagnose the present state of knowledge in Uruguay on chemical pollutants, particularly POPs, through the revision of national scientific bibliography.

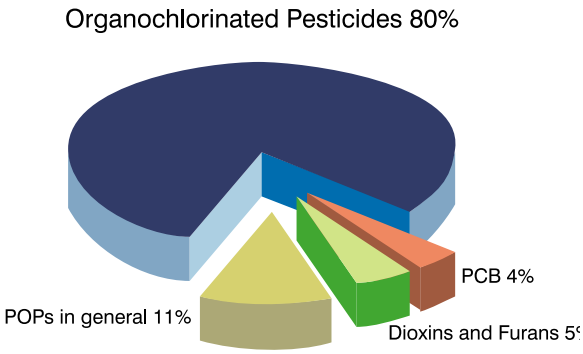
The search for information included 51 institutions, contacted through electronic means, as well as through interviews (on location and over the telephone), mainly in universities, state institutions, libraries and independent professionals.

The result of the information gathered shows that the access to information on work and documents generated in the country about Persistent Organic Pollutants is presented in a complex manner, because it is not systematized.

Information gathered is limited, both in quantitative terms of available information and also because of the number of POPs studied. The distribution of work according to POPs can be seen on Diagram 3.11 and Diagram 3.12 shows distribution per subject area. The data refer mainly to research on the presence and levels of some organochlorinated pesticides, mainly strong effects and few studies on PCBs.

The data available makes it possible to sustain that the high persistence of organochlorinated POPs in ecosystems is related to intensive use which goes back several decades. Nevertheless, it is not possible to state that the levels detected solely reflect past uses of these pesticides.

Diagram 3.11: Distribution of written work, per POP.



Most of the work has not been carried out with the purpose of providing a series of comparable data, but rather reflects individual studies for the purpose of research, surveillance or specific local studies. National information reveals the presence of POPs on different substrates: human, water and terrestrial environments. The documents gathered rarely have studies of air, bird, soil and vegetation levels.

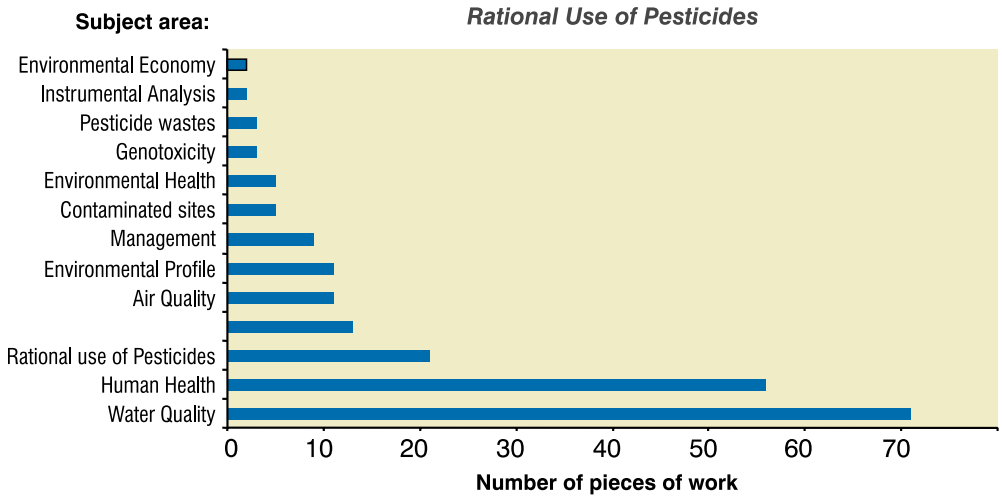
It is not possible to compare levels of POPs found in several studies, due to the lack of consistency in analytical methods and the quality controls used. It is also important to point out that Uruguay does not have regulations regarding certification and operating authorization for environmental analysis laboratories.

As a result of the contacts established with technical and research groups; the latter have mentioned the need to have national standards regarding chemical pollutants.

The information gathered shows that there is little research on the presence of POPs, and above all on its levels in Uruguay. Therefore, it is not possible to develop a general idea of the pollution status, although some available data points to the presence of POPs in certain substrates, regions and parts of the Uruguayan population.

On the basis of detected weaknesses, it is a priority to design and implement a system that incorporates and updates academic and research information generated nationwide on chemical pollutants, especially POPs, as well as to suggest research lines to fill the voids detected.

Diagram 3.12 Distribution of work per subject area.



4 Strategy and Action Plans

4.1 OVERVIEW AND IMPLEMENTATION STRATEGY

This chapter includes those actions planned in order to achieve the objectives set for the National Implementation Plan (NIP). This Plan has been designed on the basis of environmental policy principles as an additional tool for fostering an environmentally sustainable development model that may ensure justice and social integration.

By designing the National Implementation Plan the country undertakes to formally adopt it as an essential instrument for meeting the requirements of the Stockholm Convention and further enhancing the management of international cooperation resources which, together with the local resources, make it possible to implement the actions planned in the various programmes.

Effective protection of human health and the environment against persistent organic pollutants (POPs) calls for an integrated and comprehensive strategy covering all the areas involved. It must be therefore internalised that POP control and elimination should be integrated into a wider concept within the framework of a national policy for the management of chemical substances and waste.

The National Implementation Plan developed on this basis is intended to develop a general framework for improving the management of chemical substances throughout their entire life-cycle, thereby supporting the implementation of specific POP-related programmes.

This Plan has been structured into the following action plans or specific programmes:

- P1 – Improvement of Chemical Substance Management
- P2 – Environmentally Sound Management of Pesticides
- P3 – Unintentional Emissions
- P4 – Elimination of Existing Polychlorinated biphenyls (PCB)
- P5 – Prevention and Management of Contaminated Sites
- P6 – Community Sensitisation, Training and Participation

The programme "**Improvement of Chemical Substance Management**" is designed to develop and apply an integrated national policy aimed at managing chemical substances and products throughout their entire life-cycle in an environmentally sound manner, thereby making it possible to develop specific policies and programmes, as well as to support the policies on emissions and waste.

The purpose of the programme "**Environmentally Sound Management of Pesticides**" is to generate and implement a series of preventive instruments and tools in order to minimise the risks involved in the use of pesticides. This programme is part of the nationwide solutions sought for managing pesticides out of specifications ("off-spec" pesticides), as well as packaging-related waste.

The basic aim of the programme "**Unintentional Emissions**" is to minimise such emissions by adopting the best available techniques and environmental practices (BAT/BEP), and to further enhance the management of solid waste in order to reduce the generation of unintentional emissions resulting from uncontrolled burning. In order to monitor the efficiency of the measures planned it is essential to raise national awareness about the contaminants in the environment and the degree to which human beings are exposed to unintentionally generated contaminants.

The purpose of the programme "**Elimination of Existing Polychlorinated biphenyls (PCB)**" is to develop the national capacities needed in order to identify and manage existing contaminated products and waste containing PCB within the time parameters set forth in the Convention, in accordance with national realities.

The programme "**Prevention and Management of Contaminated Sites**" involves actions designed to develop and enhance local capacities to identify and manage those sites currently contaminated with POPs and/or other substances, as well as to develop a set of preventive measures that may

help minimise the generation of new contaminated sites in the future.

The programme "**Community Sensitisation, Training and Participation**" is designed to raise awareness, impart information and train the community – and particularly the most vulnerable sectors thereof – with regard to the risks involved in the use of chemical substances and other products, so as to promote responsible use and reduce risks. While this is one of the training components identified in the programmes referred to above, it is further intended to develop a framework for fostering community participation.

The National Implementation Plan strategy is based upon the following pillars:

- Coordinate and articulate Executive Power actions in order to integrate the environment variable into productive development –and, in particular, implement preventive measures with regard to POPs.
- Strengthen national capacities for the purpose of managing chemical substances and waste according to a comprehensive conception that may help ensure that the measures planned will actually be carried out by applying resources efficiently.
- Develop and adapt the specific environmental regulations identified in the various programmes in the Plan.
- Develop and reinforce a sustainable production policy by adopting the best available technologies requirement for new undertakings subject to prior environmental authorisation, and further promoting BAT for already existing activities.
- Impart information on those measures planned within the framework of the National Implementation Plan; raise awareness and train key actors in all those aspects involved in minimising the health and environment hazards associated with POPs and other persistent substances.
- Foster public-private participation instances and develop a nationwide scenario for community participation, so as to make it possible to implement the specific plans, programmes and projects in a both sustainable and effective manner.
- Improve the management of environmental information and public access to it while safeguarding the transparency of the measures and favouring integrated management on the part of those National Bodies with specific competence on the matter.
- Foster and implement those specific training and research programmes identified as necessary in the programmes in the Plan.
- With regard to the population's exposure to POPs, raise awareness about the situation at national level so as to identify other possible measures that could be taken in addition to those currently planned.

4.2 PROGRAMMES AND ACTIONS PLANNED

This sub-section provides a detailed description of the short, medium and long-term actions planned for each programme.

For the purpose of the National Implementation Plan, short-term actions are those planned for the initial five-year period elapsing from 2006 to 2010; medium-term actions are those planned for the 2011-2015 period; and long-term actions, those corresponding to subsequent periods thereafter. Long-term actions are not defined as accurately as short and medium-term ones under this sub-section.

In order to estimate the resources needed, a preliminary budget has been prepared for the short-term and medium-term actions in each programme. This estimate is detailed under sub-section 4.5. Each action planned has been recorded with the respective execution indicator(s) thereof, so as to make it possible to assess the degree of compliance. The type of financing source has also been discriminated for the purpose of identifying which actions can be carried out using only local or "national" funds, and which call for efforts to obtain international cooperation.

P1 – Improvement of Chemical Substance Management

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Regulatory framework	Improve the regulatory framework for the management of chemical substances throughout their entire life-cycle, as well as the specific rules and regulations for supporting the control of those operations involving chemical substances.	Develop rules and regulations on hazardous substances.	Draft regulations covering the entire life-cycle, and provide safety, health and environmental guidelines for the management of hazardous chemical substances.	2006 - 2007	Standard agreed upon and approved.	In process	National Directorate for the Environment (DINAMA)/ Advisory Technical Commission for the Protection of the Environment(COTAMA)/ Agro-Chemicals Chamber of Commerce (CAMAGRO)	National (Local)
			Establish shared responsibilities all along the product chain with regard to the generation and supply of information on hazards.	2006 - 2007	Set of responsibilities Standard	Proposed		National
			Formally establish labelling requirements for hazardous compounds and preparations, according to the life-cycle stage thereof.	2006 - 2008	Set of require-ments by life-cycle stage Standard	Proposed		National
		Enhance and add to the existing records of chemical substances.	Regulate the creation of a dangerous chemicals register including compounds and uses not recorded in the existing ones.	2006 - 2007	Standard agreed upon and approved	In process	DINAMA/ COTAMA/ CAMAGRO	National
			Develop economic instruments in connection with the chemical substance registers.	2006 - 2007	Proposal draft-ed for includ-ing economic instruments Number of instruments designed and approved / number of instruments planned	Proposed	DINAMA/ COTAMA	National / International Cooperation Fund (FCI)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
			Review and modify the specific records of chemicals so as to harmonize criteria and comply with the new regulations.	2006 - 2008	Number of existing proposals per record. Number of modifications made/ number of proposals planned.	Proposed		Local ("National")
		Develop new instruments for the purpose of keeping hazardous substances under safe conditions.	Draw up criteria and guidelines setting out minimum general requirements with regard to safety (including compatibility between chemical substances and other goods), health and the environment. Such requirements shall be strictly observed when storing chemical substances –whatever the mode, scale of operation or type. Coordinate the application and enforcement of the above requirements.	2006 – 2008	Criteria and guidelines agreed upon and approved.	Proposed	DINAMA / COTAMA / CAMAGRO / National Fire Brigade (DNB) / National Coastguard Authority (PNN)	National/ International Cooperation Fund (FCI)
	Upgrade mechanisms for reporting chemical substance-related risks.	Classify and label hazardous chemical substances and safety data sheets.	Adopt a dangerous chemical substance classification system to back up the regulatory framework.	2006 – 2007	Standard agreed upon, approved and adopted.	In process	DINAMA / COTAMA / CAMAGRO	National
Institutional Capacity	Enhance competent State bodies' capacities to manage POPs and other chemical substances according to the National Implementation Plan's requirements.	Train public service human resources on POP manage-ment, notwith-standing any specific actions in other programmes.	Design and implement a training programme for the various Government institutions playing a role in the management of POPs and other chemical substances.	2006 –2010	Number of workshops carried out/ planned. Number of people trained.	Proposed	Executive Power	National
			Provide training in the use of the risk assessment tool.	2007-2010	Number of training activities done/ planned. Number of people trained.	Proposed		National / FCI
			Adapt the internal structure of those bodies involved in the management of persistent organic pollutants (POPs) and other chemical substances, assigning to them appropriate human resources in accordance with the National Implementation Plan approved.	2006 – 2015	Structural changes implemented. Number of HR reassigned. Amount of materials re-assigned.	In process		National

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
			Adapt the allocation of economic resources to the management of POPs and other chemical substances that may be dangerous for the environment and human health, in accordance with the measures established in the NIP.	2007 - 2025	Budget assigned to the area / organization's budget	In process		National
		Reinforce analytical capacity by adapting the role of State labs as regards chemical substance control, exposure and monitoring.	Develop a nationwide Environmental Laboratory Network for POPs and other chemical substances, thereby promoting continuous improvement and quality assurance in the sector, as well as optimizing the use of State resources.	2006 - 2008	Network organization and start-up	Proposed	DINAMA	National / FCI
			Develop training and knowledge- transfer activities for and between Uruguayan Environmental Labs. Capitalise at national level the designation of LATU as POP Analysis Pilot Laboratory for Latin America and the Caribbean as a key actor in the process of reinforcing national capacities.	2006 - 2010	Number of annual activities carried out / training activities planned. Number of cooperation activities completed.	Proposed	DINAMA / LATU (Technological Laboratory of Uruguay)	National / FCI
			Interact and take joint actions with other laboratory networks (Food Products, etc.)	2007 - 2011	Number of cooperation activities completed	Proposed	Laboratory Network	National / FCI
			Develop and implement an analytical capacity reinforcement programme aimed at laboratory capacity building in and outside the Network.	2007 - 2010	Enhancement programme prepared and under implementation	Proposed	DINAMA / LATU	National / FCI
			Establish protocols for the representative sampling of POPs and other chemical substances in environmental and biological matrices and food products.	2006 - 2010	Number of protocols agreed upon	In process	DINAMA	National / FCI
			Establish protocols for POP analysis in environmental and biological matrices and food products.	2006 - 2010	Number of protocols agreed upon	Proposed	DINAMA / Laboratory Network	National / FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
	Introduce the socioeconomic variable when making decisions with regard to persistent organic pollutants, other chemical substances and waste management.	Enhance both economically and socially those institutions involved in the management of chemical substances.	Assign specialised human resources to State institutions in order to perform a socio-economic assessment of the new measures, thereby helping integrate this aspect into management on a permanent basis.	2006 - 2009	Number of specialised staff assigned per State agency	Proposed	Ministries and other State Agencies	National / FCI
			Generate, survey, systematise and keep up-to-date the information database, further devising mechanisms aimed at generating the information needed in order to carry out socio-economic assessments.	2006 - 2009	Project prepared. Databases prepared and in operation. Information supply procedure created and in operation.	Proposed		
			Establish both procedural and methodological frameworks for the socio-economic assessment of actions.	2006 - 2007	Methodology devised.	Proposed		
Monitor and Control	Reduce threats for human health and the environment by upgrading mechanisms for reporting potential risks and reinforcing those activities aimed at controlling and monitoring operations and activities involving persistent organic pollutants (POPs) and other chemical substances.	Label chemical substances and safety data sheets.	Draw up a plan for the implementation of the Globally Harmonized System for classifying and labelling substances and goods (GHS).	2006 - 2009	Implementation plan drawn up.	Proposed	DINAMA / COTAMA	GEF / UNITAR
			Prepare manuals, information and training materials in order to back up the implementation of GHS for those importers, operators, users and civil servants involved in POP-related activities.	2007- 2011	Number of manuals and/or publications / Number of manuals and/or publications planned.			
			Carry out training activities to support GHS implementation.	2007 - 2011	Number of annual activities actually carried out / Number of activities planned			

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
		Implement new registers.	Support the implementation of the chemical substance registers under the new rules and regulations developed, by establishing the corresponding information system.	2007 - 2009	System of information created and in operation.	Proposed	DINAMA / COTAMA	National / ICFI
			Implement a pilot project to create a Pollutant Release and Transfer Register (PRTR)	2007 - 2008	Project approved and under execution	Proposed		FCI
			Develop and implement the PRTR tool in order to apply it permanently to those chemical substances identified as priority substances.	2009 - 2025	PRTR Implementation Project approved and under execution.	Proposed		
			Implement the creation of a Register of Environmental Laboratories for POPs and other chemical substances, so as to issue and submit reports to DINAMA on the basis of a programme setting quality criteria that may guarantee reliable analytical results.	2007 - 2012	Creation regulation approved. Register in operation.	Proposed		National / FCI
		Enhance the control of substances and preparations entering National Jurisdiction areas (including substances and preparations in transit and received at duty-free zones).	Review and adopt criteria and procedures for improving the control of chemical substances entering the national territory –including duty-free areas and Customs storage facilities.	2006 - 2007	Criteria reviewed and approved.	In process	National Customs Authority (DNA) / COTAMA / National Fire Brigade (DNB) / National Coastguard Authority (PNN)	National / FCI
			Set standards; prepare lists of substances and groups of substances that should be included in routine controls.	2007 - 2009	Standard established and in application.	Proposed	COTAMA	National
		Implement a system for controlling and authorising those undertakings involving the storage of chemical substances.	Impart information on the chemical substance storage authorisation scheme throughout the country, according to the specific competences involved in each case.	2006 - 2007	Number of publications made.	Proposed	DINAMA / COTAMA / DNB/ PNN / MTSS / MSP / MTOP	National / FCI
			Reinforce the control system by coordinating procedures and criteria for authorising undertakings involving the storage of chemical substances.	2006 - 2008	Procedures and criteria agreed upon.	Proposed		National / FCI
			Establish and coordinate authorisations for the operation of such undertakings (occupational health, transportation, etc.)	2007 - 2008	Procedure established, coordinated and under implementation.	Proposed		National
			Develop and implement a single national inventory of undertakings involved in the storage of substances and goods, to support the control system.	2006 - 2007	Inventory in electronic format executed and in operation.	Proposed	DNB / DNZF / DINAMA	National / FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
		Set technical guide-lines and publish manuals in order to foster good chemical substance storage practices as per the national rules and regulations on the matter	Prepare specific technical guidelines for storing dangerous substances, including products used in the farming and cattle-raising sector. Promote good practices	2006 - 2008	Number of guides by mode and type of hazardous substance.	Proposed	DINAMA / CIU / DNB / CAMAGRO	National / FCI
			Prepare specific technical guidelines for the various storage modes. Promote good practices.	2006 - 2008	Number of guides prepared / Number of guides planned.	Proposed		National / FCI
			Prepare manuals and other materials in order to train relevant operators, high- and medium-ranking officers, State Institutions' staff and individuals on good practices, rules and regulations, sources of information and other substance-storage-management issues.	2007 - 2008	Number of publica-tions actually released / Number of publica-tions planned. Target audience actual-ly covered / Target audience to be covered.	Proposed	COTAMA	National / FCI
		Enhance substance handling control in productive activities.	Establish preventive measures and specific controls over productive activities, including fractionating.	Starting from 2006	Set minimum standards for production-related activities.	Proposed	DINAMA / COTAMA / DNB	National
		Rank and set priorities as far as chemical substances are concerned.	Implement a mechanism for identifying substances and systematically establish priorities in respect thereof, so as to take actions (plans for the replacement, elimination, training, monitoring & control, and other management stages).	2007 - 2009	Mechanism established and under execution.	Proposed	DINAMA / COTAMA	National / FCI
		Assess risk	Evaluate the risk assessment tools used in order to take actions (ban / restrict the use of substances) and suggest including such tools to support the national management system.	2008 – 2009	Assessment report.	Proposed		National / FCI
			Develop risk assessment studies for those substances identified as priority substances.	2008 - 2009	Number of risk assess-ments done / Number of total assessments.	Proposed		National / FCI

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
		Plan to substitute, eliminate / restrict imports, production, commercialisation, use of chemical substances.	Implement and coordinate the substitution, elimination / restriction in the use of those substances identified as problematic. Analyse possible alternatives.	2007 - 2011	Number of plans drawn up and agreed upon / Number of plans identified as necessary. Number of plans actually implemented / Number of plans agreed upon.	Proposed	DINAMA / COTAMA	National
	Prepare the country for the measures to be implemented as a result of the new substances included in the Stockholm Convention.	New substances.	Carry out diagnostic studies and prepare an inventory of the POPs included in the Convention, in order to evaluate the situation at national level.	2006 - 2025	Number of inventories made / Total number of inventories to be made.	Proposed	DINAMA / COTAMA	National / FCI
			Reinforce the control capacities.	2007 - 2010	Reinforcement mechanisms developed and under implementation	Proposed		National / FCI
	Prevent and reduce the risks substance storage activities entail for human health and the environment.	Prevent and minimise impacts derived from substance spillages.	Set parameters, criteria and decision schemes in order to define which cases call for containment systems.	2006 / 2009	Methodology (set of parameters, criteria and decision schemes).	Proposed	DINAMA / COTAMA / DNB	National / FCI
			Reinforce review and adoption of criteria for the design and construction of secondary containment systems.	2006 - 2009	Set of criteria and parameters.	Proposed		
		Prevent, control and take action in case of minor spillages.	Establish and impart information on containment requirements (materials, absorbent products, equipment, etc.) and minor spillage management, as well as on the disposal of the waste generated in the course of such spillages.	2006 - 2008	Number of informative activities carried out / Target audience covered.	Proposed		
		Train and promote good practices.	Prepare spillage information materials in order to foster good practices for preventing and taking primary actions in case of spillages.	2007 - 2025	Number of publications released.	Proposed	COTAMA	National / FCI
			Prepare manuals and specific training materials on the requirements for the design and maintenance of containment systems at substance storage facilities. Review the drafts to reinforce the existing materials.	2007 - 20025	Number of publications released.	Proposed		National / FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
	Prevent and reduce the health risks involved in chemical substance – related activities both at the workplace and at home.	Reinforce the system for controlling and monitoring health and safety at the workplace.	Establish workplace environmental conditions for those activities connected with the use of POPs and other chemical substances.	2006 - 2008	Set of standards defined and agreed upon.	Proposed	MTSS / MSP (Ministry of Public Health)	National / FCI
			Review and update standards in human matrices for POPs and other chemical substances.	2006 - 2010	Set of standards up-dated.	Proposed	MTSS / MSP	National / FCI
			Develop and adopt human health indicators.	2007 - 2015	Design indicators and measurement methods applied. Indicators actually applied / indicators designed.	Proposed	MSP / DINAMA	National / FCI
			Develop manuals, procedures and training activities for competent bodies involved in the standardisation, inspection and control of health and safety at the workplace (Work Conditions & Environment - CYMAT).	2007 - 2010	Manuals prepared and procedures developed.	Proposed	MTSS (Ministry of Labour and Social Security) / MSP	National / FCI
			Articulate the enforcement of international agreements on chemical substances, health, safety and the environment (e.g. ILO 170).	2006 - 2025	Number of agreements implemented.	Proposed	MTSS / MSP (Ministry of Public Health) / BSE (State Insurance Bank)	National / FCI
		Promote health and prevent risks.	Develop strategies for imparting information and training, prepare materials for the prevention of chemical risks both at the workplace and at home.	2007 - 2025	Number of publications made / Number of publications planned. Number of people actually trained / Number of people expected to be trained.	Proposed	MSP / MTSS / BSE	National / FCI

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
	Establish minimum requirements for the sale, purchase or professional (occupational) use of hazardous chemicals.	Purchase and sale conditions	Establish basic requirements to be met by the companies and the shops where chemical substances are commercialised.	2007 - 2008	Set of requirements established.	Proposed	DINAMA / MSP / MGAP / MIEM	National / FCI
			Establish mechanisms for controlling and limiting access to dangerous substances, including those included in the substitution, elimination / restriction plans.	2007 - 2009	Control mechanisms developed and under implementation.	Proposed		National / FCI
		Professional use.	Establish authorisations (valid for limited periods of time) on the basis of training activities and evaluation instances, for the purpose of reinforcing dangerous substance purchase control.	2007 - 2010	Authorisation system developed and under implementation.	Proposed	DINAMA / MSP / MGAP / MIEM	National / FCI
			Develop a support campaign based on imparting information and raising awareness.	2007 - 2009	Number of publications released. / Number of activities carried out for the purpose of imparting information and raising awareness. Number of people trained.	Proposed		
Research	Promote national research on national issues related to persistent organic pollutants and other chemical substances.	Applied research.	Coordinate final papers, theses and research work at universities and other research centres with national issues and priorities with regard to the management of POPs and other substances.	2007 - 2025	Number of specific activities developed (theses, projects, research work) on POP management / Total number of projects, theses, etc. completed.	Proposed	Universities / Research Centres	National / FCI
Information	Establish an inventory and a mechanism for updating State and/ or private resources available in the country in case of emergency, and develop communication mechanisms for accessing such resources.	Inventory of material and human resources available in case of emergency.	Keep up-to-date / upgrade a mechanism for recording and making available State and private resources in case of emergency (chemical emergencies and others).	2007 - 2009	Inventory made. Database prepared and loaded. Regular update mechanism developed and in operation.	Proposed	DNB / CIU.	National / FCI
	Facilitate access to information on analytical capacity with regard to POPs and other substances.	Directory of Laboratories	Update and upgrade the Directory of Laboratories of POPs and other substances.	2006 - 20025	Number of annual updates.	In process	DINAMA	National / FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
	Enhance the management of POPs and other chemical substances by improving the management of the information generated.	Information System on Hazardous Substances	Establish the conditions for the safe administration and management of confidential / sensitive commercial information needed in order to manage substances.	2006 - 2009	Set of conditions established.	Proposed	Executive Power / COTAMA	National / GEF
			Establish specific agreements between relevant agencies on the availability, access level, processing and publication of the information.	2006	List of agreements reached / agreements identified.	Start in the second half of 2006	DINAMA / COTAMA	
			Develop IT systems (hardware, software, connection at key points) for the purpose of generating relevant information for management.	2007 - 2008	Number of institutions connected / total number of institutions considered. Number of institutions with installed hardware / total software assigned.			
			Train users and the public in the use of the system.	2007-2009	Number of activities Number of people trained. Number of publications.			

(Source: International Cooperation Fund)

P2 – Sound Management of Pesticides

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Legal frame-work	Have legal tools for the regulation of pesticides (agricultural, veterinary, industrial and sanitary) over their entire life-cycle, including environmental aspects, human health and particularly, occupational health.	Policies for reducing the risk involved in pesticide-related activities.	Establish actions or criteria with regard to pesticides in order to regulate art. 20 of the General Environmental Protection Law, taking into account every stage in the life-cycle of these substances	2006 – 2007	Criteria and actions agreed upon and approved.	In process	DINAMA / COTAMA / CAMAGRO	National
			Establish mechanisms, i.e. integrate into the existing systems new registers, authorisations and other instruments, within the regulatory framework developed.	2007 – 2008	Mechanisms established and integrated into the regulatory frame-work.	Proposed	DINAMA/ COTAMA	
			Review and either modify or adapt existing rules and regulations on situations involving risk –including the application of pesticides.	2006 – 2007	Rules and regulations reviewed and modified.	Proposed	MGAP/ MSP/ MVOTMA	
			Include in the rules and regulations minimum training on safe pesticide handling as a requirement for obtaining authorisations for pesticide application procedures,	2006 – 2007	Rules and regulations reviewed and modified.	In process	MGAP/ MTSS/ MSP /UdelaR	
			Review, update and establish –as appropriate– reference values for pesticides in human matrices, environmental matrices (soil, air, water) and food products.	2006 – 2015	Rules and regulations reviewed and modified.	In process	COTAMA / DINAMA Municipal Governments/ AUSA	National / FCI
			Establish instruments designed to deter the use of pesticides identified as problematic, as well as instruments aimed at promoting the use of specific alternative products.	2007 – 2012	Regulation agreed upon and passed.	Proposed	MGAP/ MSP/ MEF/ MVOTMA/ MTSS	National
			Review and modify pesticide register systems in order to harmonize them.	2006 – 2008	Rules and regulations reviewed, modified and harmonized.	Proposed	MGAP/ MSP/ MVOTMA / MTSS	
			Review and update the National Food Register, as appropriate.	2006 – 2008	Rules and regulations reviewed and modified.	Proposed	MGAP/ MSP/ MVOTMA / MTSS	
		Pesticide containers	Develop and approve a specific standard for managing pesticide containers in accordance with the principle of responsibility on the part of the manufacturer / importer.	2007 – 2008	Standard agreed upon and approved	Proposed	DINAMA / COTAMA/ CAMAGRO	

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Monitoring, assessment, control and surveillance	Develop tools / instruments for monitoring pesticides in the environment, human health and food products.	Pesticide monitoring, assessment and surveillance system.	Develop and implement a plan for the purpose of reinforcing and adding to the current National Food Pesticide Monitoring Programme.	2008 – 2015	Plan developed. Number of reinforcement actions actually taken / Number of actions planned.	Proposed	MGAP / Municipal Governments / MSP / AUSA / MEF / Private actors / LATU / Ude aR	National / FCI / Canadian Fund
			Develop and implement a National Environmental Pesticide Monitoring Programme	2008 – 2025	Plan developed. Number of reinforcement actions actually taken / Number of actions planned.	Proposed	MGAP / DINAMA / INIA	
			Reinforce, support and complement the Epidemiologic Surveillance Programmes as far as pesticides are concerned. Develop and implement a National Evaluation System for assessing the population exposed to pesticides in those areas defined as critical areas.	2008 – 2011	Plan developed and implemented. Number of actions implemented / Number of actions planned.	Proposed	MSP/ DINAMA	
			Enhance human resources capacity for the purpose of monitoring pesticides.	2006 – 2010	Number of staff assigned to the monitoring plan.	Proposed	DGSA/ DGSG / DINAMA UdelaR/MSP	National / FCI
			Enhance sampling and analysis capacity for the purpose of implementing plans designed to control, monitor and watch.	2006 – 2010	Number of enhancement actions actually taken / enhancement actions planned.	Proposed	MGAP/ MSP/ MVOTMA/ MTSS/ UdelaR/ IMM	

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Environmentally sound management of pesticides	Make use of pesticides in a rational, environmentally sound way. To avoid excessive or inappropriate use thereof.	Pesticide evaluation	Develop capacities for identifying and establishing systematic priorities with regard to pesticides, in order to take management actions (plans involving substitution, elimination, training, monitoring, etc.).	2006 – 2008	Criteria adopted for determining priorities.	Proposed	MGAP / MSP / MVOTMA / UdelaR / CIU	National
			Apply Environmental and Human Health Risk Assessment tools in the design and implementation of management actions.	2005 – 2015	Risk Assessment application procedure for pesticide evaluation agreed upon and under implementation.	Proposed	MGAP / MSP	National
			Agree and implement plans for the substitution and the promotion of alternative products with a view to improving pesticide management, particularly those included in the plans.	2007 – 2015	Plans agreed upon./ plans for the future. Plans implemented / plans agreed upon.	Proposed	MGAP / MEF / MVOTMA/ UdelaR/ COTAMA	National
			Evaluate those pesticides in WHO Classes I - A and I – B on the basis of their life-cycle, so as to adopt appropriate risk management measures.	2006 – 2008	Evaluation performed and management measures proposed.		MSP	National
			Promote the replacement of highly toxic and/or persistent pesticides with lower-risk alternatives for controlling pests, including non-chemical ones.	2006 – 2012	Criteria defined and applied for identifying those pesticides to be replaced. Measures developed / pesticides identified as priority ones.	Proposed	MGAP/MSP /Farmers' Organisations/ UdelaR	National
		Occupational health and safety	Reinforce workers' training in the safe use of pesticides	Starting from 2006	Number of courses given Number of human resources trained	In process	MSP / MTSS	National / FCI
			Reinforce measures to control the use of personal protection equipment by people in direct contact with pesticides, including those who apply such products and those who develop them, among others).	2006 – 2010	Number of inspections carried out. Number of inspections established / Number of breaches detected.	Proposed	MTSS/ MSP/ UdelaR	National
			Foster the professionalisation of those responsible for applying pesticides by developing authorisation mechanisms, as well as training – evaluation instances.	2006 – 2010	Authorisation mechanism implemented.	Proposed	MTSS/ MSP/ MGAP	National
			Reinforce national capacities to implement and apply Workers Monitoring Programmes.	2010 – 2015	Reinforcement plan developed. Number of reinforce- mentactions taken / Number of actions planned.	Proposed	MTSS / MSP / UdelaR (University of the Republic)	National
		Health and safety of the population at risk	Reinforce national capacities to implement and apply Workers' families Monitoring Programmes.	2010 – 2015	Reinforcement plan developed. Number of reinforcement actions taken / Number of actions planned.	Proposed	MTSS/ MSP/ NGO / DINAMA	National / FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
	Promote applied research on pesticides.	Applied research.	Foster research on the effects on the environmentally exposed population's health.	2006 – 2015	Number of research projects being carried out at present.	Proposed	MSP / UdelaR / DINAMA	National / FCI
			Foster research on the effects on the occupationally exposed population's health.	2006 – 2010			MSP / MTSS / UdelaR / PIT-CNT	National / FCI
			Foster research on the prevention and control of pests so as to help avoid or minimise the use of pesticides.	2006 – 2015		In process	INIA / UDELAR / MGAP	National / FCI
			Promote research on crop re-entering time.	2006 – 2015				National / FCI
			Research to support the process of MWL (maximum waste limits) review and adaptation to the local conditions.	2006 – 2015		Proposed	INIA / UDELAR / MGAP	National / FCI
			Carry out pesticide degradation studies under local conditions. Perform studies on the standby times, according to the crops, practices and conditions in the country.	2006 – 2010				National / FCI

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
	Advance toward responsible Production / promote good practices.	Responsible production and promotion of good practices.	Support and promote strategies that may help avoid or minimise the use of chemicals (organic production, integrated production) and other techniques involving a rational use of pesticides, favouring the development and wide-spread adoption of other alternatives.	2006 – 2020	Campaign for the promotion of the rational use of pesticides actually implemented / campaigns planned.	Proposed	PPR/MGAP/ MVOTMA/ INIA/ FAGRO/ Farmers' Organisations	National / FCI
			Develop and validate criteria and indicators for granting economic support to new projects as first priority.	2006 – 2011	Criteria and indicators developed and validated.	In process	PPR / DINAMA / COTAMA	National
			Identify needs or gaps by systematically studying manuals, guidelines and written procedures on good practices and integrated or alternative approach to pests.	2006 – 2007	Survey completed. Needs identified.	Proposed	PPR / MGAP / MVOTMA / INIA / FAGRO / UdelaR / MSP	National / FCI
			Design and prepare guide books on good practices by crop according to the production cycle stages, as well as on alternative pest management techniques.	2006 – 2008	Number of guides books prepared / number of guide books planned.	Proposed	PPR / MGAP / MVOTMA / INIA / FAGRO	National / FCI
			Prepare a manual on good practices in Cattle Dips.	2006 – 2008	Manual prepared.	In process	DINAMA / MGAP / UDELAR	National / FCI
			Promote the use of personal protection equipment within the framework of a nationwide strategy for reducing pesticide-related risks.	2006 – 2008	National Campaign for reducing pesticide-related risk under implementation.	Proposed	PPR / MGAP / MVOTMA / INIA / UdelaR	National / FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Training	Impart information so as to raise awareness about rational handling of pesticides, risks involved and possible con-sequences of inappropriate use thereof. Share this knowledge with those actors involved in the various stages of the life-cycle.	Rational handling of pesticides, risks and consequences of inappropriate use.	Publish guides – Organise workshops and outreach activities on Good Practices, Integrated Management of Pests, Organic Production and other production alternatives that may help minimise the use of pesticides.	2007 – 2010	Number of outreach activities performed/ Number of activities planned.	Proposed	PPR (Main Projects) /MGAP MVOTMA/ UTU	National / FCI
			Include in-depth study and continuous update of the topic (sound use, rational management, risks, etc.) in the syllabi of universities (degree and post-graduate courses), technical institutes, and also other schools connected with cattle-raising and farming activities (rural schools, inter alia).	2006 - 20025	Number of changes or new courses on the subject included in the curricula.	Proposed	MEC / CODICEN / UdelaR	National
			Cooperate and reinforce early diagnosis in case of exposure to pesticides in on-going medical Education programmes.	2006 - 20025	Programme developed, implemented and maintained.	Proposed	MSP / UdelaR	National
			Develop and implement sensitisation and outreach programmes for those identified as key actors.	2006 - 20025	Number of activities actually done. /Number of activities planned.	Proposed	PPR / DINAMA	National / FCI
			Prepare and offer training courses to pesticide users; prepare and supply the corresponding training materials.	2006 – 2010	Course prepared Number of courses actually offered. / Number of courses planned.	In process	MSP/ DINAMA/ MGAP PPR/ UdelaR /INIA	National / FCI
			Train competent body inspecting staff in the control of occupational health, and prevention staff in the rational management of pesticides and good practices, among others.	2006 – 2010	Number of training activities actually carried out. / Number of activities planned.	Proposed	MSP/ MTSS / UdelaR	National / FCI
			Assess the need to reinforce the specific capacity to control pesticides entering National Jurisdiction areas.	2006 – 2010	Assessment performed.	Proposed	MGAP/ DINAMA/ MEF	National / FCI
			Offer risk assessment-focused training to Government institutions' decision makers.	2005 – 2010	Number of executive staff trained.	In process	MGAP/ MSP/ DINAMA / MTSS / MIE	National / FCI

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Management of waste contaminated with pesticides	Establish an environmentally sound pesticide container management system.	Infrastructure for pesticide container management.	Implement a pilot container management system.	2005 – 2007	Programme implemented. Amount of containers recovered / total amount released to the market.	In process	CAMAGRO/ DINAMA	National
			Establish stockpiling centres in strategic points throughout the country.	2006 – 2007	Stockpiling centres established / stockpiling centres planned.	In process	CAMAGRO/ PPR/ MGAP/ DINAMA	National / FCI
			Implement a nationwide container management programme in accordance with the principle of responsibility on the part of the manufacturer / importer.	2007 - 2025	Container management programme developed and implemented. Level of geographic coverage. Amount of containers recovered / amount of containers released to the market.	Proposed	Pesticide manufacturing companies / pesticide importing companies.	National / FCI
		Training & Dissemination	Implement a training programme for farmers on the three-fold cleaning procedure, supported by an information and sensitisation campaign.	2005-2010	Number of training courses offered. Number of people trained	In process	MGAP/ PPR/ CAMAGRO/ DINAMA	National / FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
	Establish an environmentally sound system of management of pesticides out of specification (OOS) within the framework of the regulations on integrated management of solid industrial, agricultural and service waste.	Prevent the generation of this type of waste.	Evaluate the reasons why this type of waste is generated, and make proposals for preventing and minimising the generation of such waste.	2006 – 2007	Proposal prepared.	Proposed	MGAP / DINAMA/ Companies/ Farmers' Associations/DNA	National
			Design and implement the necessary instruments.	2007	Instruments designed and implemented. Number of instruments implemented / Number of instruments identified as necessary.	Proposed	MGAP / DINAMA / DNA	National
		Capacity to manage pesticides out of specification.	Design and implement an integrated system for managing pesticides out of specification.	2006-2009	Integrated OOS management system designed and implemented. Amount of waste managed / amount of waste generated.	Proposed	MGAP/ DINAMA/ Companies/ Farmers' Associations/DNA	National / FCI
			Establish mechanisms for eliminating stockpiles OOS pesticides on a regular basis.	2005 – 2025	Mechanism for OOS elimination established and implemented.	In process	DINAMA / Manufacturing or importing companies.	National / FCI
			Design and implement a mechanism that records off-spec pesticide claims and allows for their follow-up.	2006 - 2025	Mechanism established and implemented.	Proposed	DINAMA/ MGAP	National / FCI
		Sensitisation and spreading of information	Design and implement a communication campaign aimed at raising awareness and imparting information on measures for preventing the generation of OOS waste and improve the management thereof.	2006-2008	Sensitisation campaign designed and implemented. Number of activities actually carried out / Number of activities planned.	Proposed	DINAMA/ MGAP /PPR/ Companies	National / FCI
Information and coordination	Establish and maintain adequate communication links between the different actors involved in the management of pesticides.	Establish a nation-wide information system.	Enhance the mechanisms of communication and coordination between Government actors.	2006-2010	Interintitutional cooperation agreements signed.	In process	MGAP/ MSP/ MTSS/ DINAMA	National / FCI
			Reinforce communication mechanisms between Government actors and the community.		Acceptance level.			

(Source: International Cooperation Fund)

P3 - Improvement of Unintentional Emissions Management

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Regulatory framework	Count on a legal tool for supporting the actions to be taken with regard to unintentional emissions.	Policies intended to reduce the generation of unintentional POP emissions.	Include in the regulatory framework of the sector specific rules and regulations for preventing, controlling and monitoring unintentional emissions.	2006 - 2008	Number of rules and regulations introduced. Number of new rules and regulations identified as necessary.	In process	MVOTMA / DINAMA / COTAMA	National
			Approve the regulations on integrated management of toxic waste from industrial, agricultural and service activities.	2006	Regulations passed.	In process	MVOTMA / DINAMA	National
			Regulate the law on the prevention and protection against accidents, and establish legal instruments to enforce it.	2007	Regulation of the Law agreed upon and approved.	Proposed	MVOTMA / DINAMA / DNB / MI	National
			Establish standards for dioxin and furan emission, and compliance schedules for those sectors identified as key sectors.	2006 – 2008	Emission standards established and compliance schedule prepared and agreed upon.	Proposed	MVOTMA / DINAMA / CIU	National
			Develop economic instruments that may facilitate the application of those measures established in the specific rules and regulations for the purpose of reducing unintentional emissions.	2007 – 2008	Number of instruments designed and approved. Number of instruments identified.	Proposed	MVOTMA/ DINAMA/ COTAMA/ National Commission for Cleaner Production	National / FCI / GTZ

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Environmental monitoring	Establish a permanent programme for monitoring unintentional POP generation in the environment, so as to improve knowledge and decision making for the purpose of taking preventive and/or corrective actions.	Environmental unintentional POP monitoring system.	Reinforce the development of research on local bio-indicators for POPs, mainly in water and sediments.	2007 – 2010	Number of projects executed in this area./ Number of projects connected with environmental monitoring procedures.	Proposed	DINAMA / UdelaR	FCI
			Develop the environmental monitoring methodology and apply it to a pilot area.	2006 – 2008	Methodology approved and validated.	Proposed	DINAMA	FCI
			Design and implement a nationwide programme for monitoring POPs in the environment.	2008 – 2025	Environmental monitoring plan prepared. Actions actually taken./ Actions planned.	Proposed	DINAMA	National / FCI
			Prepare a methodological guide for monitoring those productive activities that may potentially generate POPs, including the determination of the baseline before monitoring such pollutants.	2007	Guide prepared.	Proposed	DINAMA	National / FCI
		Reinforce analytical capacity and sampling for detecting unintentional POPs[1].	Design and implement a programme for reinforcing sampling capacities for monitoring unintentional POPs in emissions, environmental matrices and food.	2007 – 2010	Design prepared. Actions actually taken./ Actions planned.	Proposed	MVOTMA / DINAMA/ UdelaR / GEF	National / FCI
			Reinforce the capacity to analyse dioxin-type polychlorinated biphenyls (PCB).	2006 – 2008	Analytical capacity reinforced. Number of parameters and matrices that can be analysed./ Number of parameters and matrices that are necessary.	Proposed	DINAMA / MGAP / LATU	National / FCI

(Source: International Cooperation Fund)

1 Please refer to Analytical Capacity section

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
			Promote the development of screening of unintentional POPs	2006 – 2010	Nº of screening techniques under development. Nº of screening techniques actually established/Nº of techniques under development.	Proposed	DINAMA / UdelaR	National / FCI
			Evaluate the analytical capacity for the generation of unintentional POPs not included in the Stockholm Convention.	2006 – 2007	Evaluation finished	In process	DINAMA	National
			Design and implement a strengthening plan for unintentional POPs analysis not included in the Stockholm Convention.	2007 – 2012	Plan designed. Strengthening measures established/ planned measures.	Proposed	DINAMA/Chain of Laboratories /GEF	FCI
Management of solid waste Processes of uncontrolled combustion	Reduce emissions and associated risks caused by the inadequate management. of solid waste and uncontrolled burning processes over the environment and human health.	Management of solid waste and uncontrolled burning.	Implement a programme to strengthen the capacity to control regulations for solid waste produced by industries, agriculture and related industries and services.	2006 – 2009	Nº of strengthening measures implemented/ Nº of planned measures. Nº of Human resources assigned to control waste.	Proposed	DINAMA / Municipalities	National / FCI
			Implement a programme to improve the management of urban solid waste with the aim of minimizing the non controlled waste burning and disposal under inconvenient conditions.	2006 – 2011	Nº of measures carried out/Nº of planned measures The Nº of fires at dumping sites registered annually	Proposed	DINAMA / Municipalities	National / FCI
			Promotion of projects related to the management / appraisal of agricultural waste aimed at eliminating practices of non controlled burning of waste.	2007 – 2012	Nº of appraisal projects and improvement of development management.	Proposed	DINAMA / PPR	National / FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
			Strengthening of national capacities (human resources, infrastructure) for the appropriate environmental management of waste and development of research lines applied to the improvement of waste appraisal.	2006 – 2011	Nº of implemented training activities/ planned activities Inventory of infrastructure. Nº of research projects applied to appraisal/ Total Nº of projects in the waste area.	Proposed	DINAMA / CIU / UdelaR / Municipalities	National / private / FCI
			Evaluation (technical and socio-economic) of alternative processing and establishment of management guidelines for different wastes in order to prevent POPs generation.	2006 – 2008	Evaluation finished. Guidelines designed and agreed upon.	Proposed	DINAMA	National / FCI
			Design and implement a training, sensitization and information programme aimed at generating sectors and population in general.	Design 2006 Implementation, first stage: 2007-2009. Second stage: 2009-2020	Design finished. Nº of implemented campaigns/ Nº of planned campaigns	Proposed	DINAMA/ Municipalities/ Universities / MEC	National / FCI
		Surveillance systems to prevent fires.	Strengthen National Fire Brigade instruments related to forest and field fires prevention and in improving estimation of affected areas	2008 / 2025	Instruments actually incorporated / necessary instruments	Proposed	DINAMA / DNB / MI / MGAP	National

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Control and reduction of emissions – clean production.	Control and reduce unintentional emissions of industrial and power sectors and improve their global performance.	Control and surveillance of activities form the point of view of unintentional emissions.	Institutional strengthening – training for staff and the environmental authority in charge of assessment and control.	2007 – 2008	Nº of training activities implemented/ planned training activities	Proposed	DINAMA / CIU	FCI
			Improve the knowledge and control of activities which are potential informal emitters and/or not yet taken into account.	2006 – 2008	Nº of activities reported	Proposed	DINAMA / Municipalities	National
			Draw up guidelines for the productive and power sectors with the alternative of unintentional POPs sampling and analysis endorsed by the environmental authority. Define obligations for the monitoring plan of the industrial sector. Promote self-control and develop a plan to make it easier.	2007 – 2008	Guidelines drawn up. Plan to facilitate self-control already made.	Proposed	DINAMA / CIU	National / FCI
			Implement a monitoring plan for emissions and waste which come from priority sectors: metallurgic (steel, copper, aluminium, zinc), clinker production and lime, co-incineration of hazardous waste, generation of power, hospitals' solid waste, pulp and paper mills.	2006 – 2009 (Frequency to be established in each company according to results)	Nº of measurements performed/ Nº of planned measurements	In process	Companies of priority sectors	Companies / external financing
			Implement a monitoring plan of emissions of the remaining considered as potentially emitters.	2008 – 2010	Nº of measurements performed/ Nº of planned measurements	Proposed	Companies	Private sector / External financing

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
		Improvement in operation conditions, emissions treatment and treatment and disposal of unintentional POPs contaminated waste.	Develop guidelines in order to establish the BAT and BET requirements for new enterprises installed within the framework of new EIA regulations.	2006 – 2007	Guidelines already developed.	Proposed	DINAMA	National
			Evaluate productive sectors identified as priority with respect to technologies used and present a BAT and BEP implementation project in companies already installed.	2007 – 2008	Project made. Evaluations have ended / planned evaluations. Implementation plan already designed.	Proposed	DINAMA / CIU / state companies	National / FCI
			Establish agreements of clean production with different sectors involved	2007 – 2008	Nº of agreements established /nº of planned agreements	Proposed	DINAMA	National
			Design and implement a programme of evaluation of POPs in solid waste in order to establish measures to implement the BAT and BET in appraisal, treatment and final disposal alternatives.	2007 – 2008	Programme implemented	Proposed	DINAMA	FCI
	Reduce unintentional emissions coming from the use of substances and products.	Entrance of POPs contaminated substances and products to the country.	Establish quality standards for substances and preparations presumably contaminated with non intentional POPs	2008 – 2009	Quality standards established	Proposed	DINAMA / MGAP / DNA / MSP	National

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Quantification of unintentional emissions	Periodical evolution efficacy of actions implemented up to now.	Estimate of unintentional emissions in the country.	Development and implementation of a programme to reduce uncertainty in emissions estimate.	2007 – 2008	Implementation of programme Level of uncertainty of new inventory vis-à-vis the one previously drawn up.	Proposed	DINAMA / INE / DNB	National / FCI
			Update the national inventory of dioxins and furans emission.	2009 2014 2019 2024	Survey of typical factors of emission.	Proposed	DINAMA	National
			Incorporation of factor of emission typical of the monitoring plan.		Survey of typical factors of emission.	Proposed	DINAMA	National / FCI
			Evaluate the usefulness of the Registry of Emissions and Contaminants Transference (RETC) in order to improve estimates of unintentional POPs emissions.	2007	Conclusive report on the RPTR usefulness.	Proposed	DINAMA	National / FCI
		Research in priority areas	Promote the national research on non controlled burning of arboreal species used as fuel in the country.	2007 – 2009	Nº of national projects being performed.	Proposed	DINAMA / MGAP / UdelaR	National / FCI
			Development of an evaluation of risks methodology in order to identify critical areas.	2008 – 2009	Programme to apply methodology already finished. Measures implemented/planned measures in the programme.	Proposed	DINAMA / MSP / UDELAR	FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Food safety.	Reduce the risk of exposure to unintentional generation compounds through food ingestion.	Control of foods and production chain.	Establish quality criteria for the production chain an commercialization of food or animals and human use as well.	2007 – 2008	Quality criteria established and agreed upon.	Proposed	DINAMA / MGAP / MSP /MUNICIPALITIES	National
			Evaluate the possibility of requiring quality certificates for national or imported food for animals.	2008 – 2009	Conclusive report on the possibility of requiring a quality certificate.	Proposed	DINAMA / MGAP / MSP / DNA	National
			Determine the ingestion of DLC in national population or on a regional basis.	2009 – 2010 2014-2015 2019-2020	Survey of the DLC ingestion value in population.	Proposed	DINAMA / MSP / MGAP	FCI
Communication.	Enhance the quality of information on unintentional POPs generation problems	Mechanisms of communication and bonds with population and civil organizations.	Train spokesmen within and outside the environmental authority.	2007 – continuo	Nº of training activities done/ Nº of planned training activities . Nº of trained HR	Proposed	DINAMA / UdelaR	National
			Establish periodical communication programmes and programmes for specific information requirements.	2007 – continuo	Programmes being carried out.	Proposed	DINAMA	National
			Establish response mechanisms in the event of inaccurate information used by media.	2007 – continuo	Protocols established and under implementation	Proposed	DINAMA	National

(Source: International Cooperation Fund)

P4 – Elimination of PCB stockpiles

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Legal framework / Regulations	Provide a juridical tool to support actions to be implemented with respect to the reduction of risks due to the exposure to PCB and the elimination of their use and stocks for the year 2025.	Specific regulations to support policies for the reduction of risks caused by exposure to PCB by means of the appropriate management of oils and equipments or materials.	Develop and approve regulations for the management of dielectric oils and equipment that contain those oils, including aspects related to their life cycle and periods of time to eliminate stocks.	2006 - 2007	Regulation agreed upon and approved.	In process	DINAMA / UTE / CIU / Maintenance companies	National / FCI
			Create and approve specific regulations for the integral management of lubricant oils and cut fluids used.	2006 - 2007	Regulation agreed upon and approved.	Proposed	DINAMA/Importers and producers of lubricant oils and cut fluids	National
			Regulate scrap metal companies operations.	2007 - 2008	Regulation plan agreed upon with municipalities. Regulation approved.	Proposed	DINAMA /Municipalities	National
			Develop and approve additional regulations which comprehend other PCB contaminated materials.	2010 - 2011	Regulation agreed upon and approved. Regulation identified as necessary.	Proposed	DINAMA / COTAMA	National
			Review and adapt regulations related to Occupational Health applied to workers who are exposed to PCB. Establish guidelines for the monitoring of exposed workers.	2006 - 2007	Evaluation report finished. Nº of adaptations made/ Nº of adaptations identified for the plan. Guidelines agreed upon and prepared.	Proposed	MSP / MTSS	National / FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Monitoring.	Establish an evaluation and surveillance system for oils with PCB and material or equipments which contain them and sites potentially contaminated by them.	Monitoring systems of PCB in oils and materials or equipment which contain them.	Strengthen national capacities for the monitoring of PCB in equipments.	2007 - 2009	DINAMA, UTE and private laboratories capable of facing the equipments characteristics.	Proposed	DINAMA /UTE / Laboratories network	National / FCI
			Design a monitoring plan for the transformation of distribution, owned by UTE.	2006	Plan designed.	Proposed	DINAMA / UTE	National / FCI
			Implement the monitoring UTE network plan.	2007 - 2010	Nº of activities made/ Nº of activities planned in the Plan.	Proposed	UTE / DINAMA	National / FCI
			Develop and implement a monitoring plan for the remaining transformers.	2006 - 2010	Plan drawn up. Nº of activities made/ Nº of activities planned in the Plan.	In process	DINAMA/Owners of transformers (Main trade unions and other owners)	National
		Identification and preliminary evaluation of places potentially contaminated with PCB.	Establish the criteria to exchange and update the information on maintenance sites, transformers and electric condensers manufacturing, sites of treatment and final disposal of their waste and other places potentially contaminated with PCB. Establish criteria for their preliminary evaluation and priority.	2006	Criteria established.	Proposed	DINAMA	National / FCI
			Draw up a plan for the management of PCB contaminated sites. Consolidate the inventory of potentially contaminated places and carry out a preliminary evaluation.	2007 - 2010	Plan drawn up.	Proposed	DINAMA / MUNICIPALITIES	National / FCI
		Strengthen the analytical and sampling capacity in order to determine PCB in different matrixes identified as key ones.	Strengthen the PCB sampling and analysis capacity in different matrixes.	2006 - 2008	Execution degree of the strengthening programme.	Proposed	DINAMA / Laboratories network	National / FCI

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Oils, equipment and PCB contaminated materials management and contaminated sites.	Reduce emissions and associated risks on environment and human health due to the inappropriate management of oils, equipments and PCB contaminated materials. Eliminate PCB contaminated equipments stocks.	Strengthen capacities to control and manage PCB contaminated equipments.	Strengthen the capacity to control regulations for solid waste, PCB and used oils management.	2007 - 2010	Resources assigned for these areas control. Nº of training activities carried out.	Proposed	DINAMA / Municipalities /DNA	National / FCI
			Institutional agreement between MVOTMA and UTE which allows the sustainability and execution for the elimination of equipments, oils and other materials contaminated with PCB.	2006	Agreement agreed upon and approved.	Proposed	DINAMA / UTE	National
			Elaboration of directions of procedures and operative conditions for electric equipment maintenance companies or other companies that work with possible PCB contaminated materials.	2006 - 2007	Guidelines drawn up.	Proposed	DINAMA / UTE / Maintenance companies	National / FCI
			Draw up guidelines for key sectors with PCB sampling and analysis alternatives.	2006 - 2007	Guidelines drawn up.	Proposed	DINAMA / UTE / Maintenance companies	National/ FCI
			Establish the authorization and register of companies that manufacture, install, provide maintenance or services of dielectric oil operating equipments.	2007	Register implemented and operating.	Proposed	DINAMA	National
			Promote the register of scrap metal companies.	2007 - 2008	Nº of activities registered/ Nº of existing activities	Proposed	DINAMA / Municipalities	National

2 Please refer to Analytical Capacity section.

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
			Develop and implement a HR training programme, sensitization and information to actors identified as key actors.	2006 - 2010	Training programme developed. Nº of training activities carried out / Nº of planned activities	Proposed	DINAMA / UTE / CIU / Maintenance companies	National / FCI
			Coordinate the procedures necessary to export materials contaminated by PCB and other materials to be treated abroad.	2006 - 2007	Procedure developed and coordinated.	Proposed	DINAMA / UTE / DNA / ANP / Equipments owners	National / FCI
			Design a plan for the identification of other equipments contaminated with PCB.	2006	Plan developed.	Proposed	DINAMA	National / FCI
			Implement the plan for the identification of other equipments contaminated by PCB.	2007 - 2010	Plan developed.	Proposed	DINAMA / Equipments owners	National / FCI
		Appropriate treatment of PCB contaminated waste	Technical/social and economic evaluation of alternative treatment and final disposal of PCB contaminated waste and establishment of technical criteria for each alternative.	2007	Evaluation finished. Technical criteria established.	Proposed	DINAMA	National / FCI
			Strengthening of national capacities (human resources and infrastructure) for the treatment of PCB contaminated waste.	2007 - 2010	Nº of human resources trained. Type and quantity of existing infrastructure.	Proposed	DINAMA / UTE	National / FCI / Privados
		Elimination of stock.	Formulation of a plan to replace transformers and condensers according to identified priorities identified, taking into account the national reality and the development of national capacities	2007 - 2008	Replacement plan developed.	Proposed	DINAMA / UTE / CIU	National / FCI
			Make the inventory of other equipments partially contaminated by PCB.	2007 - 2015	Nº of inventories being made/Nº of planned inventories. Nº of inventories finished.	Proposed	DINAMA	National / FCI
			Implement the elimination of stocks.	1997 - 2025[3]	Quantity of eliminated waste / stocks inventoried.	In process	UTE / equipments owners / DINAMA	National / Privado.
			Make a permanent update of stocks	2006 - 2025	Inventory annually updated.	Proposed	DINAMA	National / FCI

(Source: International Cooperation Fund)

3 UTE started stocks elimination in 1997.

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
		Reduction of exposure risks of workers who work with dielectric oils and equipments possibly contaminated by PCB.	Evaluate levels of exposure and control the use of elements of safety elements. Develop additional preventive measures.	2007 - 2008	Evaluation finished. Preventive measures identified.	Proposed	MSP / MTSS	National / FCI
			Implement the additional preventive measures.	2007 - 2009	Nº of implementations made / Nº of planned implementations	Proposed	MTSS / companies	National (Empresas)
		Management of sites contaminated by PCB.	Review and adopt reference and intervention levels for PCB in soil, sediments and underground water for different scenarios of use at the place. (Make reference to actions proposed related to revision and adoption of regulations for the Contaminated Sites Area).	2006 - 2007	Levels established.	Proposed	DINAMA / COTAMA	National / FCI
			Design a strategy to characterize sites potentially contaminated by PCB and their management.	2007 - 2008	Strategy developed	Proposed	DINAMA	National / FCI
			Implement the characterization strategy and management plans for each site (including their remediation), according to priorities established by virtue of the environmental risk including human health.	2008 - 2025	Nº of management plans designed/ Nº of sites identified/ Nº of interventions finished / Nº of planned interventions.	Proposed	DINAMA / Sites owners and other responsible parties	National / FCI / Privados

P5 – Prevention and management of contaminated sites

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Information	Prevent inappropriate uses of sites contaminated by POPs and other persistent toxic substances.	Identification and permanent update of information about Contaminated Sites.	Implement the exchange and permanent update of information with key institutions through Database of Potentially Contaminated Sites.	2006 – 2008	Key institutions connected to the Database.	In process	DINAMA / MUNICIPALITIES / MSP / DNB	National
			Determine potentially and priority contaminated sites and carry out a preliminary evaluation.	2006 – 2010	List of priorities Nº of priority sites evaluated.	In process	DINAMA	National
Risks Management	Minimize and mitigate risks for the environment and human health, associated with sites contaminated by POPs and other persistent toxic substances.	Methodologies which allow the implementation of integral evaluations of environmental issues related to Contaminated Sites.	Adopt procedures for the Evaluation of Environmental Risk for Human Health: Identification and Characterization of Sources, Routes and ways of exposure and receptors.	2006 – 2007	Procedure Developed and agreed upon.	Proposed	DINAMA / MSP / UdelaR	National
			Establish indicators of human exposure to POPs and other persistent toxic substances and define procedures for their application in accordance with risk and vulnerability criteria.	2006 – 2007	Indicators and agreed procedures.	Proposed	MSP / UdelaR	National
		Plans for the characterization and management of priority contaminated sites.	Carry out the follow up and control of characterization and management plans of Gas Stations and other places with underground and aerial tanks of chemical products.	2006 – 2015	Characterized sites. Management plans developed and implemented.	In process	DINAMA / Fuel distribution companies/ owners of sites and other responsible parties	National/ Privados
			Carry out the characterization of sites where activities of formulation and storage of POP pesticides, draw up and implement management plans.	2006 – 2015	Characterized sites. Management plans developed and implemented.	Proposed	DINAMA / Formulation and storage companies / owners of sites and other responsible parties	National/ FCI/ Privados

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
			Carry out the characterization of sites of maintenance companies, transformers and electric condensers manufacturers, sites of final or temporary disposal of waste and other places potentially contaminated, develop and implement management plans. (Make reference to actions proposed related to sites contaminated in the PCB Area).	2006 – 2025	Sites characterized management plans developed and implemented.	Proposed	DINAMA/ Maintenance and manufacturing companies / Owners of sites and other responsible parties.	National/ FCI/ Private
			Design and implement a plan for the characterization and management of non active municipal dumping sites.	2006 – 2015	Plans of characterization and management developed.	Proposed	DINAMA / Municipalities / owners of sites and other responsible parties.	National/ FCI
			Make an evaluation and environmental characterization of irregular settlements studied by the PIAI and elaboration of environmentally appropriate organizing projects.	2006 – 2015	Settlements characterized. Organizing projects approved.	In process	PIAI / Municipalities	National/ BID
			Carry out the characterization of other priority contaminated sites, among them, sites associated with heavy metal contamination, develop and implement management plans.	2006 – 2015	Priority sites characterized. Management plans developed and implemented.	Proposed	DINAMA / Owners of sites and other responsible parties	National/ Private
		Plans for the characterization and remediation of “orphan” contaminated sites.	Design administrative and financial tools to promote the characterization and remediation of “orphan” sites.	2008 – 2010	Tools developed and agreed upon.	Proposed	DINAMA	National/ FCI
			Generate and activate the administrative and financial tools in order to rehabilitate priority “orphan” sites.	2010 – 2025	Priority orphan sites rehabilitated /orphan sites identified as a priority.	Proposed	DINAMA	National/ FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Institutional and Regulations Capacity.	Enhance the institutional capacity and regulations instruments for the management of site contaminated by POPs and other persistent toxic substances.	New regulations for the management of contaminated sites.	Review the following criteria: • Responsibilities in management. •Reference and intervention levels for contaminants in soil, sediments and ground water, for different scenarios of site uses. • Procedures for the characterization of sites and evaluation of environmental risk and human health. • Remediation techniques.	2006 – 2007	Regulations proposal agreed upon.	In process	DINAMA / COTAMA	National/ FCI
			Desarrollo, Development, approval and adoption of specific regulations.	2008	Regulations approved.	Proposed	DINAMA / COTAMA	National
		Institutional capacity for the management of contaminated sites.	Establish protocols and develop techniques for the POPs and other priority and persistent toxic substances analysis, particularly, in soil, sediments and waste. (refer to proposed actions related to the strengthening of analytical capacity in the Substances Management Area).	2006 – 2010	Protocols developed and approved.	In process	DINAMA / Laboratories network	National/ FCI
			Ensure the sustainability in the management of contaminated sites by means of the assignment of qualified human resources and material resources in the corresponding public institutions.	2016 - 2025	Nº of human resources assigned to the management of contaminated sites in institutions.	Proposed	DINAMA / MUNICIPALITIES /MSP	National

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Prevention of risks	Prevent the generation of sites contaminated by POPs and other persistent toxic substances	Better environmental practices and better technologies available in industrial and agricultural activities and services.	Develop protocols and manuals of good practice for the storage of chemical products in aerial and underground warehouses, particularly for fuels tanks in gas stations. (Refer to proposed actions related to a regulations framework for the appropriate storage of chemical substances in the Substances Management area.	2006 – 2008	Protocols and manuals developed and agreed upon.	Proposed	DINAMA/ DNB /Fuels Distribution Companies / other companies	National/ FCI
			Promote an appropriate environmental management of industrial, agroindustrial and services waste by establishing guidelines for their treatment and final disposal in order to minimize the generation of contaminated sites.	2006 – 2025	Control and prevention measures established and under implementation	In process	DINAMA / CIU	National/ Privados
			Establish criteria of prevention, minimization and mitigation of impacts, criteria to monitor soil and underwater quality and criteria of abandonment of locations which shall be applied in processes of Evaluation of Environmental Impact and Authorizations of Emissions of certain potentially soil contaminating activities.	2006 – 2008	Documents of criteria developed and agreed upon.	Proposed	DINAMA	National
Knowledge	Develop national capacity for scientific research and technical research related to the management of contaminated site.	Research activities in the university sector and other research centres.	Promote research activities in the academic sector and other research institutions in order to improve knowledge and generate better techniques of characterization and appropriate technologies for the remediation of the soil, water and sediments contaminated by POPs and other persistent toxic substances.	2006 – 2025	Annual lines of research	Proposed	DINAMA / UdelaR /LATU / INIA / Centres of Research	National/ FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Sensitisation and training	Sensitize and train key actors in the generation and management of contaminated sites.	Training for Government staff on a local and national basis.	Develop theoretical-practical activities in order to train local and national Government staff, with the assistance of international experts specializing in management of contaminated sites: technical, juridical and economic tools.	2006 – 2015	Nº of activities made / Nº of activities planned	Proposed	DINAMA / Municipalities / MSP	National / FCI
		Sensitization and training for professionals of construction, real estate -territorial planning and engineering sectors.	Develop opportunities of imparting information aiming at agents, entrepreneurs and real estate planners, building companies, financial institutions, academic circles and professionals associations.	2007 – 2015	Nº of opportunities of imparting information generated annually	Proposed	DINAMA / Public and private institutions and companies	National
			Incorporate the management of contaminated sites in university subjects and courses related to environmental issues.	2006 – 2010	Nº of courses which include it in their plans.	Proposed	DINAMA /RETEMA / Private educational institutions	National

(Source: International Cooperation Fund)

4 Information System Project.

5 Information System Project.

P6 – Sensitization, Awareness, Training and Community Involvement

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Information, training and sensitization	Provide information to sectors connected to the handling of chemical substances and to citizens about new regulations.	Impart information on the new rules and regulations.	Update the new database with e-mails of public and private institutions involved.	2006 – 2007	Database updated	In process	DINAMA	National / FCI4
			Keep database updated.	2008-2025	Database maintenance performed.	Proposed	DINAMA	National / FCI5
			Communicate the new legislation and let it be known to institutions registered in the database and to the media.	2006 – 2025	Press releases and information mechanisms carried out.	Proposed	DINAMA	National
	To improve the quality of the information for the public in general with respect to the issues related to POPs and other chemical substances.	Implement a strategy to communicate risks at a national level in order to improve the management of chemical substances and the appropriate environmental management of waste.	Design a strategy to communicate risks to people in the following areas: Use of chemical substances, Waste management.	2007	Strategy designed	Proposed	DINAMA / MSP	National / FCI
			Implement a training programme on risks for the communicators sector.	2007 – 2008	Training programme of risks implemented. Nº of training activities implemented / training planned	Proposed	DINAMA / MSP	National / FCI
			Maintenance of the training programme on risks for the communicators sector	2009 – 2025	Maintenance of programme implemented	Proposed	DINAMA / MSP	National / FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
			Maintain the training programme on risks for the communications sector.	2009 – 2025	Maintenance of the implemented programme	Proposed	DINAMA / MSP	National / FCI
			Design and implement a strategy of risks communication.	2008 – 2009	Strategy implemented. Nº of activities of communication implemented/ Nº planned	Proposed	DINAMA/MSP	National
			Maintain strategy.	2010 – 2025	Maintenance of strategy implemented.	Proposed	DINAMA/MSP	National
		Train public and private institutions and media, responsible for communication and providing information to the public.	Design a strategy of outreach, information and training in the POPs area and environment and in techniques of risks communication.	2006	Strategy designed.	Proposed	DINAMA/ Offices in charge of communication in public and private institutions / Civil organizations / PPR	National / FCI
			Implement the strategy for imparting information and training.	2007 – 2010	Nº of activities carried out/planned activities Target audience coverage/target audience planned	Proposed	DINAMA/ Offices in charge of communication in public and private institutions / Civil organizations / PPR	National / FCI
			Maintain the strategy for imparting information and training.	2011 – 2025	Maintenance of strategy implemented	Proposed	DINAMA/ Offices in charge of communication in public and private institutions / Civil organizations / PPR	National/FCI
			Prepare support material for the training of communicators.	2006 – 2007	Nº of materials prepared and distributed/Nº of materials planned.	Proposed	DINAMA/ Offices in charge of communication in public and private institutions / Civil organizations / PPR	National/FCI
			Exchange and update information through biannual reports via electronic newsletters, Websites for the continuity and sustainability of training.	2008 – 2015	Mechanisms to exchange information and communication already working (Website, electronic reports)	Proposed	DINAMA/ Offices in charge of communication in public and private institutions / Civil organizations / PPR	National/FCI

(Source: International Cooperation Fund)

6 Information system project

7 Information system project

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
	Improve the information the country has about POPs and other chemicals	Update and exchange the existing information on POPs and other substances among Government and national and international private institutions.	Design and implement a national system of information on chemical substances.	2006 – 2007	National system of information designed and implemented.	In process	DINAMA	National/FCI[6]
			Maintain the national system of information.	2008 – 2025	Maintenance of the national system of information implemented.	Proposed	DINAMA	National/FCI[7]
			Design and implement training workshops for professionals and those who make decisions in the system of information management and maintenance.	2006 – 2008	Nº of workshops implemented /workshops planned. Nº of RH trained / Nº of RH identified as target HR.	In process	DINAMA	National/FCI
	Strengthening of the inclusion of environmental behaviour in formal education, placing particular emphasis on prevention.	Provide training within the formal primary and secondary education system for the environmentally rational management of chemical substances and associated risks.	Promote and facilitate the implementation of subjects related to the management of chemical substances, their effects on environment and public health in primary and secondary education programmes and how to minimize them.	2006 – 2007	Issues involved and included in primary and secondary education programmes.	In process	Environmental education Network (Ministry of Education and Culture/ DINAMA) / MSP	National/FCI
			Maintain the implementation.	2008 – 2025	Maintenance of the implementation carried out.	Proposed	Environmental education Network (Ministry of Education and Culture/ DINAMA) / MSP	National/FCI
			Prepare educational and conceptual material on appropriate environmental management of chemical substances, to be used in classrooms	2006 – 2007	Material prepared and distributed.	In process	Environmental education Network (Ministry of Education and Culture/ MSP DINAMA) / MSP	National/FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
		Improve the training for technical schools students in key areas connected to the handling of chemical substances in the prevention of risks associated to said substances.	Promote and facilitate the incorporation of training on the appropriate use of chemical substances in work areas, in specific subjects.	2006 – 2007	Nº of training courses included and carried out.	Proposed	Environmental education network (Ministry of Education and Culture / DINAMA) / MSP	National/FCI
			Maintain training.	2008 – 2025	Maintenance of training implemented.	Proposed	Environmental education network (Ministry of Education and Culture / DINAMA) / MSP	National/FCI
			Prepare educational material to be used in classes related to the appropriate environmental handling of chemical substances.	2006 – 2007	Material prepared and distributed.	In process	Environmental education network (Ministry of Education and Culture / DINAMA) / MSP	National/FCI
		Improve training of university students in key careers relative to chemicals management, productive processes and environmental management in the areas covered by the Stockholm Convention.	Incorporate contaminated sites and unintentional emissions issues to university subjects.	2007 – 2009	Contaminated sites and unintentional emissions issues incorporated to university subjects.	Proposed	DINAMA / UdelaR / RETEMA / MSP	National/FCI
			Maintain training.	2010 – 2025	Maintenance of training implemented.	Proposed	DINAMA / UdelaR / RETEMA / MSP	National/FCI
			Strengthen specific matters of environmental risks evaluation.	2006 – 2007	Matters of environmental risks evaluation strengthened in university careers.	Proposed	DINAMA / UdelaR / RETEMA MSP	National/FCI
			Maintain matters strengthening.	2008 – 2025	Maintain matters strengthening done.	Proposed	DINAMA / UdelaR / RETEMA MSP	National/FCI
			Promote the implementation of research projects in areas related to the agreement.	2007 – 2010	Nº of current research projects	Proposed	DINAMA / UdelaR / RETEMA MSP	National/FCI

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
	Reduce risks of exposure to POPs in inhabitants of irregular settlements due to the unsuitable management of waste by improving their knowledge of associated risks.	Inform, train and coordinate actions with Government institutions connected to the regularization of settlements programme and work with waste scavengers.	Implement workshops, information meetings and training for Government institutions that work with those settlements with respect to the appropriate management of solid waste and its effects on the environment and health.	2006 – 2008	Nº of activities made / planned activities.	In process	DINAMA / PIAI / Municipalities /MSP / MIDES	National/FCI/BID
		Sensitise, inform and train irregular settlements inhabitants on the appropriate waste management and prevention of risks.	Implement workshops of information and sensitization for inhabitants of settlements about burning, burying and dumping of solid waste.	2006 – 2009	Nº of settlements covered/Nº of settlements identified as a priority	In process	DINAMA / PIAI / Municipalities /MSP / MIDES	National/FCI/BID
			Prepare materials to make the process of information and sensitization easier.	2006 – 2007	Materials prepared and distributed	In process	DINAMA / PIAI / Municipalities /MSP / MIDES	National/FCI/BID
	Stimulate a change in society in order to improve the management of urban solid waste and the responsible use of chemical substances.	Inform the society about good practices of solid waste management.	Design and implement, on an annual basis, massive information campaigns for the community in general, about solid waste burning, burying and dumping.	2007 – 2010	Annual campaigns designed and implemented.	Proposed	DINAMA /Municipal Governments /MSP	National/FCI
			Strengthening of municipal education campaigns for the improvement of urban solid waste management.	2007 – 2010	Strengthening of campaigns implemented.	Proposed	DINAMA /Municipal Governments /MSP	National /Departmental / FCI
		Inform society about the good management of chemical substances at a domestic level.	Design and implement, on an annual basis, massive information campaigns for the community in general about the good management of chemical substances at home.	2007 – 2010	Annual campaigns designed and implemented	Proposed	DINAMA /MSP	National/FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
			Maintain communication, information and sensitization campaigns.	2011 – 2025	Maintenance of campaigns done.	Proposed	DINAMA /MSP	National/FCI
	Strengthen the industrial and energy sectors in the environmental management of chemical substances during their life cycle by sensitizing and training their human resources	Sensitize and train about BAT and BEP at a technical and management level	Implement courses, workshops and meetings for the productive sector to support the programme of unintentional emissions.	2006 – 2009	Nº of activities made / activities planned.	In process	National Commission for Clean Production / DINAMA	National/FCI
			Prepare information material to promote the application of BAT and BEP in strategic sectors.	2006 - 2008	Information material prepared and distributed	Proposed	National Commission for Clean Production / DINAMA	National/FCI
		Sensitize and train on prevention and management of contaminated sites at a technical and management level.	Implement courses, workshops and meetings for productive sector to support the programme of contaminated sites.	2006 – 2008	Courses, workshops and meetings implemented/ planned activities	In process	DINAMA	National/FCI
			Prepare information material to promote the prevention of the generation of new contaminated sites.	2006 – 2008	Information material prepared and distributed	Proposed	DINAMA	National/FCI
	Strengthen the local and National Government sector through training and a permanent update at a technical and management level.	Implement a programme of permanent training for staff in national and municipal bodies in the following areas: • Substances management • Pesticides • Unintentional emissions • Contaminated sites • PCB	Register the need of training in the established areas and prepare a specific training programme.	2006 – 2007	Needs registered.	Proposed	DINAMA /UdelaR	National /FCI
			Design a comprehensive training and permanent update programme.	2006 – 2007	Programme and update designed.	Proposed	DINAMA /UdelaR/ MGAP/ PPR/ CAMAGRO/ INIA	National/FCI

(Source: International Cooperation Fund)

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
			Coordinate the first stage of the training programme implementation with the implementation of specific programmes.	2006 – 2010	First stage of the training programme implemented.	Proposed	DINAMA /UdelaR MGAP/ PPR/ CAMAGRO/ INIA	National /FCI/BID
			Maintain the training programme	2011 – 2025	Programme maintenance done.	Proposed	DINAMA /UdelaR MGAP/ PPR/ CAMAGRO/ INIA	National /FCI/BID
			Prepare and distribute support material to facilitate knowledge update.	2006 – 2008	Support material produced and distributed.	Proposed	DINAMA /UdelaR MGAP/PPR/ CAMAGRO/ INIA	National/FCI/BID
		Train national and local Government staff in occupational health controls.	Prepare and distribute training guides and manuals for the control of chemical substances handling and management and their effects on health.	2007 – 2010	Training guides and manuals produced and distributed.	Proposed	MSP/MTSS/DINAMA MGAP	National/FCI
	Reduce exposure risks of chemical substances users due to their unsuitable handling.	Sensitise and inform users of chemical substances about their appropriate environmental use in their domestic and work areas.	Design and implement an annual campaign of communication about chemical substances appropriate environmental use in domestic and work areas and their effects on health.	2006 – 2010	Annual campaigns designed and implemented. Nº of activities carried out/ activities planned.	Proposed	DINAMA	National/FCI
		Train key users of substances on risks prevention techniques.	Implement theoretical and practical workshops for users of chemical substances about their appropriate use at labour level.	2007 – 2009	Workshops implemented.	Proposed	DINAMA/ MGAP	National/FCI
			Prepare support material for training.	2007	Support material designed.	Proposed	DINAMA/ MGAP	National/FCI

Subject-Matter	Objective	Strategic Line of Action	Action Proposed	Execution Period	Execution Indicators	Status	Key Implementing Actors	Funding Sources
Community Involvement	Improve the channels of communication and information between the civil society and public bodies.	Promote the development and strengthening of communication mechanisms with civil society organisations from public and private institutions.	Introduce the implementation of a specific module in the Integrated System of chemical substances information in order to facilitate and promote communication and information from and towards civil society.	2006	Specific module incorporated.	In process	DINAMA	National/FCI
			Implement information and exchange workshops about chemical substances management with civil society organizations in Uruguay.	2007	Information and exchange workshops implemented.	Proposed	DINAMA/ Civil society organizations/ MSP / Municipal Governments	DINAMA/ Civil society organizations / FCI
	Improve the civil society participation to find solutions to POPs and other chemical substances.	Design a community involvement Programme and strengthen tools for its implementation	Design an agreed by consensus strategy for citizens participation and a programme for its implementation.	2006 – 2007	Strategy and programme designed.	Proposed	DINAMA/ Civil society organizations	DINAMA/ Civil society organizations / FCI
			Implement a first stage of implementation as a model project.	2007 – 2008	First stage of model project implemented.	Proposed	DINAMA/ Civil society organizations	DINAMA/ Civil society organizations / FCI
			Design mechanisms to facilitate the citizens responsible control.	2006 – 2008	Mechanisms for the citizens responsible control designed.	Proposed	DINAMA/ Civil society organizations / MGAP / MSP / MTSS / Municipal Governments.	DINAMA/ Civil society organizations / FCI
			Generate continuity and sustainability mechanisms for participation.	2008 – 2025	Continuity and sustainability mechanisms generated.	Proposed	DINAMA/ Civil society organizations / Municipal Governments.	DINAMA/ Civil society organizations / FCI
			Strengthen mechanisms to respond in an efficient manner to civil society consultations, suggestions, reports, claims and uncertainties related to chemical substances management.	2007 – 2015	Response mechanisms strengthened and operating.	Proposed	DINAMA /MGAP/MSP/ Municipal Governments.	DINAMA /FCI
		Strengthen the civil society organisations to promote responsible participation on the part of the community.	Identify the needs for effective strengthening and design a programme in order to meet such needs.	2006 –2007	Needs identified and strengthening programme designed.	Proposed	DINAMA / Civil society organizations	National/FCI
			Promote the implementation of projects in POPs and other substances areas.	2007 – 2015	Projects implemented.	Proposed	DINAMA / Civil society organizations	National/FCI
			Implement the strengthening programme.	2008 – 2010	Strengthening programme implemented.	Proposed	DINAMA / Civil society organizations	National/FCI

(Source: International Cooperation Fund)

4.3 KEY ACTORS IDENTIFIED

Table 4.1 below presents a summary of the main key actors identified in programmes without prejudice of the fact that each programme matrix may show more specificity with respect to its own area of intervention.

Table 4.1. Major key actors identified in the Implementation Plan

Key actors	Main areas of action
State and private companies including import activities, formulation, industrial and services activities.	• Implementation of measures to reduce risks associated with chemical substance use • Implementation of measures aimed at minimising the generation of unintentional emissions. • Implementation of measures aimed at minimising the generation of waste and the environmentally sound management thereof. • Identification, characterisation and management of equipment currently used and PCB-contaminated stock. • Characterisation and remediation of contaminated sites.
Producers Associations or Organizations	• Environmentally sustainable management of pesticides. • Environmentally appropriate management of off-spec pesticides and container waste. • Promotion and adoption of good practices. • Facilitate process of sensitization and training.
AUSA (Uruguayan Agency For Food Safety)	• Implementation and execution of plans for food safety.
BSE (State Insurance Bank)	• Health prevention for workers • Attention for workers.
CAMAGRO (Agro-Chemical Chamber of Commerce)	• Promotion to improve the management of pesticides. • Implementation of programmes for the environmentally sound management of off-spec pesticides and container waste. • Facilitate and promote sensitization and training programmes in the safe use of pesticides and prevention of risks.
CIU (Chamber of Industries)	• Promotion of measures aiming at minimising unintentional emissions in productive sectors. • Promotion of measures for the improvement of solid waste management and contaminated sites prevention and management. • Promotion of practices for cleaner production, BAT and BEP including the safe handling of substances. • Facilitate the identification of PCB-contaminated stock.
COTAMA	• NIP monitoring and assessment. • Development and regulations adaptation. • Coordination of actions between the public and private sectors.
DNA (National Customs Authority)	• Control of goods across borders, according to measures set forth in the plan to improve the management of chemical substances, pesticides and management of PCB stocks.
DNB (National Fire Brigade)	• Implementation of measures aiming at the minimisation of POPs unintentional generation due to fires. • Control for the sound management of chemical substances storage and prevention of accidents.
DNZF (Free Zone National Office)	• Facilitate the implementation of measures planned for each free-zone user. • Support to implement measures to control the management of chemical substances and waste in free-zone area.
Electric Equipment Maintenance companies	• Implementation of preventive and management measures arising during the development of the plan for the elimination of stocks contaminated by PCB.
Local / municipal governments	• Simplification of processes of sensitization, awareness and training as well as the implementation of the citizens participation programme. • Identification and management of contaminated sites and implementation of measures aiming at minimizing associated risks. • Control of activities in order to guarantee the compliance of preventive and corrective measures arising from the plan. • Implementation of measures aiming at the improvement of urban solid waste management and prevent the uncontrolled burning of waste in final disposal locations.
INE (National Statistics Institute)	• Integration of some indicators identified as necessary in order to improve the information identified in the different programmes.

Table 4.1. Major key actors identified in the Implementation Plan

Key actors	Main areas of action
UdelaR and INIA	• *Developing research projects applied in key areas. • *Facilitating the process of improving the information about chemical substances. • *Human resources training. • *Reinforcing the sensitisation processes. • *Giving technical assessment to the Executive Power on policy making regarding the implementation of the NIP
LATU	*Developing and strengthening national resources for the control of POPs in environmental and food matrices.
MEF	Developing economic instruments that facilitate the application of the proposed measures.
National Board for Cleaner Production.	Facilitating the process of implementation of the national policy of sustainable production. Coordinating the activities for dissemination of information and training in the sustainable production areas and the implementation of BAT (Best Available Techniques) and BEP (Best Environmental Practices).
MGAP	* Promoting the implementation of measures tending to reduce the health and environment risks, arising from the use of pesticides. *Controlling the planned measures against pesticides in use in agriculture and veterinary. * Facilitating the training process for a safe use of pesticides.
MIDES	Encouraging community action in waste management, and promoting sensitisation and training programmes in order to minimise the risks of the population with the lowest income level.
MIEM	Promoting industrial development policies within the scope of sustainable development.
MSP	Promotion and application of preventive measures in order to reduce the risk to human health, in coordination with MVOTMA and MTSS. *Development of epidemiological monitoring programmes. *Promotion and facilitation of training in, sensitisation to and awareness of the sound use of substances and risk management.
MTSS	Promoting and applying preventive measures so as to minimise the worker's health risks. * Controlling over the identified measures in the plan regarding the exposed worker. *Promoting and Facilitating training in, sensitisation to and awareness of the sound use of substances and risk management.
MVOTMA	• Ensuring implementation of measures formulated in the plan in the framework of national environmental policy. • Coordinate the implementation of actions with other public and private stakeholders. • Promoting and facilitating the training, sensitisation and awareness process and community participation. • Facilitating international cooperation funds to be applied in the development of projects relative to the Plan.
NGOs	*Giving support to the development and implementation of the measures identified in NIP, thus, enabling fluent information between the state agencies and society and the development of local projects.
PIT-CNT	*Facilitating the implementation of training and sensitisation programmes directed at the workers to reduce their exposure to the risk of chemical substances and actively participate in the creation of specific instruments identified in the plan, emphasising those that involve measures to protect the worker's health.
PNN	*Strengthening control over the handling of chemical substances in relevant areas.
Environmental Educational Network.	*Facilitating and promoting the educational, sensitisation and awareness processes, identified in the Plan.

4.4 SOCIO-ECONOMIC ASSESSMENT

Historically, Uruguay has not explicitly considered economic analysis to design its environmental policy. The country is lagging behind other countries in the region, such as Chile or Colombia, in terms of incorporating the economic analysis as a tool for improving decision making relative to the environment.

Within the framework of the project, efforts were put forth to make the socio-economic evaluation of the plan, to perform a cost-benefit analysis of the alternatives, and inform the people who are responsible for the decision-making about the social and economic costs and benefits involved in the implementation of the necessary measures stemming from the Stockholm Convention obligations.

The limited information available has made it impossible to prepare a socio-economic evaluation that would have helped to achieve the pre-established goal.

To perform a cost-benefit analysis on the Implementation Plan, Uruguay should have or be able to generate --at low cost-- enough information for such evaluation. Even though this topic was examined, the task was not carried out during the project. Without this information, it is not feasible to apply any assessment methodology to economically quantify the effects of the measures set forth in the Plan.

Unfortunately, such evaluations cannot be made in Uruguay due to the lack of sufficient information. Despite the efforts made within the framework of the project to gather information or estimate a part thereof, those efforts were unsuccessful. The absence of information or systematisation has been recognised as one of the main obstacles to conduct an economic analysis of the project. Nevertheless, considering Uruguay has ratified the Convention; it is deemed that the socio-economic analysis does not become essential since the objectives of the policies have already been set out in the Convention. However, the instrument becomes adequate to evaluate different alternatives or to learn about the number of benefits of the implementation from a quantitative point of view.

As a result of the analysis, Section 6 presents a conceptual framework of a project for the development of the socio-economic evaluation tool, simultaneous to the implementation of programmes P2, P3, P4 and P5.

Annex IV includes the report issued by the expert in the economic area covering the following aspects:

- The concepts, tools and methods of the economic and social analysis relative to the handling of hazardous substances, identifying its weaknesses so that the tool may be implemented at a national level.
- Recommendations concerning collection and management of information so that in future DINAMA/ MVOTMA can perform economic analyses.
- Submission of economic quantifications related to some NIP areas.
- Presentation of policy-related recommendations by means of economic instruments the author suggests.

4.5 ESTIMATED BUDGET

According to the above section 4.2, the budget for the initial two five-year periods of implementation has been estimated by budgeting the activities included in each one of the programmes that make up the Plan.

In order to submit the Plan budget and improve the identification of its components, the actions have been grouped as follows:

- Actions that involve the strengthening of institutional capacities, so that the proposed goals are fulfilled.
- Actions that involve the establishment of specific regulations identified in each one of the programmes.
- The research lines identified as priorities in order to deepen knowledge and reinforce decision-making and field interventions.
- The components associated to dissemination, sensitisation, training and community participation, integrating cross-cutting training activities.
- Actions identified as necessary to protect workers from exposure risks related to POPs and other priority substances.
- Actions aimed at improving the food-security area by gaining knowledge on the population's level of exposure.
- Actions that involve the implementation of measures to improve waste management in order to minimise unintentional emissions resulting from uncontrolled burning and the generation of stockpiles of obsolete pesticides and contaminated sites.
- Specific actions contained in the following programmes: P1 "Improvement of Chemical Substances Management", P2 "Environmental Sound Management of

Pesticides", P4 "Elimination of Existing PCB" and P5 "Prevention and Management of Contaminated Areas" that do not integrate the areas mentioned above.

- Actions to enhance environmental management through the implementation of BAT/BEP in the sectors identified as potential generators of unintentional emissions, as well as measures identified in the pesticides programmes directed to the implementation of better production technologies in the livestock, forestry and agriculture productive sector, in order to minimise the impact caused by the use of pesticides.
- The set of actions that involve monitoring, discriminating those related with the industrial sector and the environmental monitoring plan, which incorporates both the components of unintentional emissions and pesticides.

It should be emphasised that the budgeting that was drawn up excludes all the actions involving field interventions because each one of them calls for a particular analysis for which the current information is insufficient, considering the extent of the measures and their corresponding budgetary needs. For example, the actions that involve alterations or reconversion of productive sectors, the treatment of the whole amount of stockpiles of PCB-contaminated waste, or the remediation processes in contaminated sites, are not included in this category. As it was easy to estimate the necessary investment, intervention activities in the urban solid waste management area outside the metropolitan Area, were included in the budget. These interventions will help improve final disposal of waste, to minimise uncontrolled burning.

For similar reasons, the human resources and necessary materials to ensure the sustainability and continuity of the lines of action in the long term, have not been entered into the budget.

It should be pointed out that the non-budgeted field interventions shall involve a substantial part of the resources needed for the implementation and that such resources will most probably come from private or public sources.

According to the drawn up budget and taking the above-mentioned constraints into account, it is deemed necessary to apply --for the first ten years of implementation-- the amount of 58 million US dollars, of which 66% will be focused on the initial five-year period.

Table 4.2 shows the budget details while Table 4.3 and Graphic 4.1 show the needed resources grouped according to the programmes included in the Plan, with an additional breakdown to manage waste as this involves field intervention measures.

Table 4.2: Budget of the National Implementation Plan for the initial two five-year periods

		Initial five-year periods	
Área	Line	2006 - 2010	2011 - 2015
1	**Institutional Capacity Building (1)**	**9.210.000**	**2.320.000**
	Unintentional Emissions (2)	3.450.000	1.120.000
	Substances Management	4.120.000	650.000
	PCB	680.000	200.000
	Pesticides	600.000	200.000
	Contaminated Sites	360.000	150.000

2	**Regulations**	**365.000**	**160.000**
	Unintentional Emissions	70.000	-
	Substances Management	90.000	80.000
	PCB	30.000	10.000
	Pesticides	150.000	70.000
	Contaminated Sites	25.000	-
3	**Research**	**1.805.000**	**1.885.000**
	Unintentional Emissions	445.000	445.000
	Substances Management	400.000	400.000
	Pesticides	500.000	300.000
	Contaminated Sites	460.000	740.000
4	**Dissemination, Sensitisation and Training**	**5.855.000**	**1.950.000**
	Elaboration and distribution of materials	780.000	250.000
	Design and implementation of strategies, campaigns, programmes and projects for training, information communication and dissemination.	2.900.000	600.000
	Design and implementation of specific activities in training, information and sensitisation.(3)	1.175.000	300.000
	Design and implementation of projects and programmes to enhance responsible community participation	1.000.000	800.000
5	**Workers' Health**	**1.450.000**	**1.300.000**
	Substances Management	500.000	800.000
	PCB (4)	150.000	-
	Pesticides	800.000	500.000
6	Food Safety	**1.040.000**	**800.000**
	Unintentional Emissions	690.000	600.000
	Pesticides	350.000	200.000
7	**Waste Management**	**8.350.000**	**3.900.000**
	Improve Urban Solid Waste Management	7.500.000	3.500.000
	Improve the agricultural and industrial waste to reduce unintentional emissions and generation of contaminated sites(5)	500.000	200.000
	Pesticide residue management (5)	350.000	200.000
8	**Contaminated sites: other costs (6)**	700.000	1.400.000
	Preliminary Identification and Evaluation of potentially contaminated sites	250.000	-
	Plans for characterisation and remediation of priority sites (7)	450.000	1.400.000
9	**PCB: other costs (8)**	**1.400.000**	**150.000**
	Design and implementation plans for monitoring transformers	790.000	-
	Design and implementation plans for identifying other equipments contaminated with PCB	30.000	-
	Preliminary identification and evaluation of sites potentially contaminated with PCB	250.000	-

	Elaboration of directories and procedures	50.000	-	
	Evaluation of treatment alternatives	100.000	-	
	Development of infrastructure for the treatment of PCB	-	-	
	Elaboration of plan for equipment renovation & implementation (9)	30.000	-	
	Other equipments Inventory	50.000	150.000	
	Elimination of stockpiles (10)	-	-	
	Plan for characterisation and management of PCB-contaminated sites (7)	100.000	-	
10	**Improvement of environmental development**	**997.000**	**200.000**	
	BAT/BEP (11)	177.000	-	
	Pesticides	820.000	200.000	
11	**Monitoring of unintentional industrial emissions**	**1.000.000**	**1.000.000**	
12	**Environmental Monitoring**	**2.290.000**	**2.250.000**	
	Unintentional emissions	1.150.000	1.400.000	
	Pesticides	1.140.000	850.000	
13	Substances Management: other costs	**4.210.000**	**2.100.000**	
	Labelling	150.000	-	
	Records	550.000	200.000	
	Storing of POPs and other substances	90.000	-	
	Prioritisation of substances, risk assessment and substitution plans concerning POPs and other substances	1.200.000	450.000	
	Inventories and country situation diagnostic of new Convention POPs	900.000	900.000	
	Spills prevention, minimisation and control	240.000	100.000	
	Control of commercial activities related to POPs and other substances	80.000	50.000	
	Information	1.000.000	400.000	
		Totals (USD)	**38.672.000**	**19.415.000**	**58.087.000**

Comments:

(1) It comprises all the actions tending to the strengthening of the analytical capacity, appointment and training of human resources, procedures design and elaboration of manuals.

(2) It includes design of actions for enhancing the analytical capacity and first phase of implementation. Subsequent actions for implementation are not included.

(3) It includes specific actions in the Sensitisation, Substances Management, Pesticides, Contaminated Sites and PCB areas

(4) It refers to evaluation of labour exposure levels to PCB and design and implementation of preventive measures.

(5) The infrastructure for improving the waste management is not included.

(6) The assignment of human resources and materials in public institutions necessary to sustain the implemented actions regarding contaminated sites management for the initial five-year period is not included.

(7) The costs originated by the public or private actors on implementing measures such as remediation and monitoring of the contaminated sites management are not included.

(8) The higher cost of the measures in relation to the PBC programme is closely associated to the field interventions, and the building of infrastructure for the treatment, renovation of equipment, treatment and elimination of stockpiles and remediation of contaminated sites. It is not possible at present to include these actions in the budget.

(9) The subsequent five- year period is not included in the budget for reasons given in item (8)

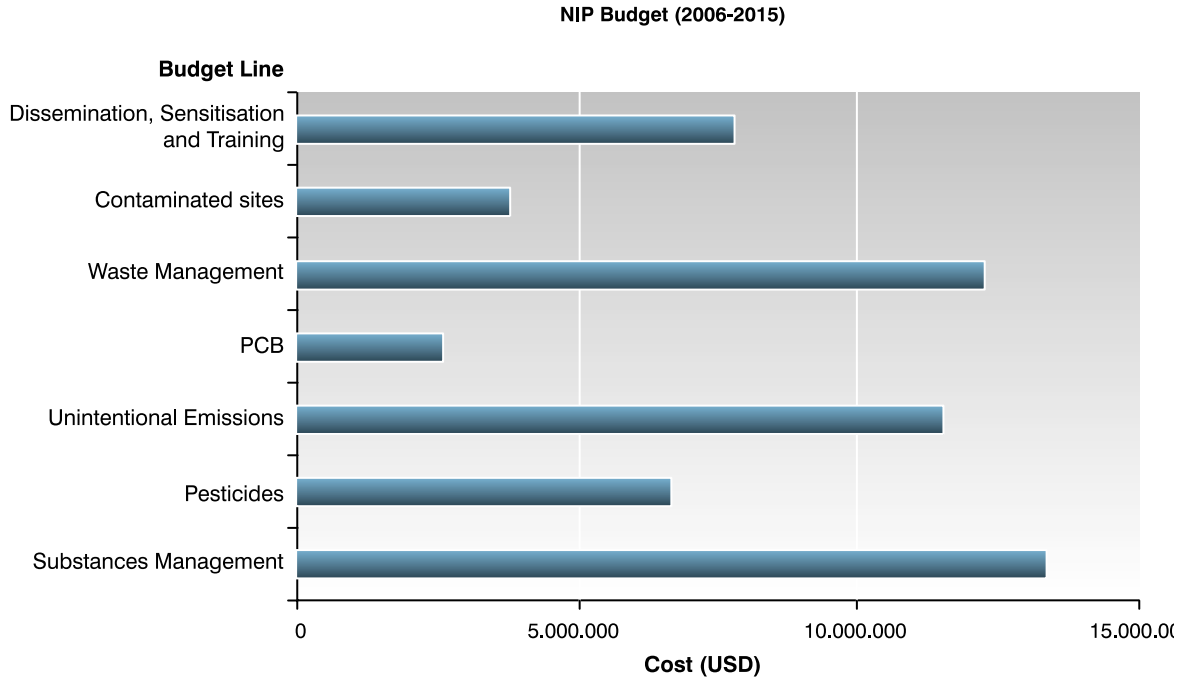
(10) The initial and subsequent five-year periods are not included in the budget for reasons given in item (8).

(11) There is no investment in technological renovation .In regard to this matter, the only item that is included in the budget is technology evaluation.

Table 4.3 Budget Plan according to each Programme

	USD	
Main Lines of Action	**2006 - 2010**	**2011 - 2015**
Substances Management	9.320.000	4.030.000
Pesticides	4.360.000	2.320.000
Unintentional emissions	6.982.000	4.565.000
PCB	2.260.000	360.000
Waste Management	8.350.000	3.900.000
Contaminated Sites	1.545.000	2.290.000
Dissemination, Sensitisation and Training	5.855.000	1.950.000

Graph 4.1 Plan Costs according to each Budget Line



4.6 ACTIONS INITIATED WITHIN THE FRAMEWORK OF THE PROJECT

Within the framework of Project development to prepare the Plan, a series of actions have been initiated in order to advance its implementation. A summary of the actions initiated at the country level is featured below. Annex 3 contains a summary of both the main activities and final products.

4.6.1 Management of Chemical Substances

Priority substances

During the development of the Plan, a schedule of priority substances was prepared. This schedule integrated substances that were included in the Stockholm Convention and other Multilateral Agreements on the Environment, as well as other hazardous substances for the country. The schedule has been prepared to support decision making relative to surveillance and control plans, as well as identification and implementation of plans for substitution or restricted use of some substances. This schedule is conceived as a dynamic list; it is a preliminary version to help in the decision process at the domestic level, concerning the need of working with a group of priority substances, which will have a differentiated control system as when compared to the universe of substances being used and commercialised in our territory.

Information System for Chemical Substances Project

Based on the needs found in the area of information management associated with the management of chemical substances, Uruguay started a process to design a National Information System for Chemical Substances with the help of UNDP, as implementing agency, through a PDF-A financed by GEF funds. The project will begin in June 2006. Chapter 6 contains the text of the project that was submitted and approved.

The need for such a system arises from the diagnosis made by means of surveys carried out with the purpose of deepening understanding of the national institutional capacity. This diagnosis revealed that the fragmented information and the difficulty in relating and linking data tended to restrict an integrated management of chemical substances.

Within this frame, and as a pilot programme, a project was designed between two institutions (DINAMA-MTSS) to merge their information. This pilot programme included components to compile, systematise, and share data and information in an electronic manner by using infrastructures and valid rules of control. The result and products thus obtained, made clear the need to establish a protocol and methodology to facilitate the exchange and training of those actors involved throughout the different stages.

Chemical Substances Work Group in the Scope of COTAMA.

Upon request of DINAMA, within the framework of COTAMA, a Working Group on Chemical Substances (GT/SQ in Spanish), of a technical and inter-institutional nature, was created in December 2005. Its purpose was to draw up a technical proposal for the implementation of Article 20 of the General Law for the Protection of the Environment (Law Nº 17.283).

This Working Group is represented by MVOTMA, as coordinator, and the following institutions and organisations:

Ministries: MDN, MEC, MEF, MGAP, MI, MIDES, MIEM, MRE, MSP, MTOP, MTSS; Other Institutions: ANP, UdelaR, Municipalities, CIU, PIT-CNT, CAMAGRO, CUA, NGOs, and rural associations.

Laboratories Network

As result of the studies conducted in the area of the national analytical capacity evaluation, in an early stage of its development, a network of environmental laboratories was created. For this reason, a survey was made on the laboratories that are in charge of analyzing POPs and other substances in human and environmental matrices

and a directory, with public access, containing information about laboratories and other types of analysis, analytes and matrices was launched.

The purpose of this network is to group the public and private laboratories, which work along the same lines, with a focus on comprehensive enhancement of the sector.

4.6.2 Pesticides

Decree to ban pesticides included in the Convention schedule

As part of the process to coordinate activities in the framework of the NIP development and implementation of phase one measures, in October 2005, Uruguay approved the Decree banning the introduction, production and use of the nine pesticides included in the Convention, as well as the preparations or formulas that may contain them. This decree definitely blocks any alternative to using these pesticides, thus assuring that these substances will not be used again in our country, the ban comprises all usage, including the areas of agri-business, domestic and industry, sanitation or any other way in which these substances might be used.

The decree also establishes the obligation of holders of those chemical substances included in the regulation, to declare any stock to MVOTMA or MGAP.

Cattle dips project

During the development of this project, DINAMA together with DGSG, the School of Veterinary and the School of Sciences of UdelaR, started a programme in order to improve the environmental activities relative to bovine and ovine cattle dips. The purpose of this programme is the implementation of measures to prevent the environmental impacts caused by the use of chemical products to control ectoparasites, securing a proper final disposal of the residues originated by such activity. At present, a pilot programme to perform field evaluation of measures to be recommended according to each product, is under way.

Elimination of stockpiles of obsolete pesticides

Once the team working in the project finished the obsolete pesticides inventory, DINAMA and MVOTMA started actions to eliminate stockpiles. To that end, a request for cooperation was made to the agro-chemicals sector, having gained the support of Crop Life International and CAMAGRO to implement the elimination of stocks through the execution of certain measures concerning their packaging and transportation abroad.

The field activities related to the residues packaging and their storage in a depot fit for that purpose were carried out in February 2006, deeming it possible that the elimination operations abroad should be finished by June 2006. The implementation of this project is a good example of successful private-public participation in POPs management.

Parallel to these actions, there have been first contacts with key actors to enable the design and implementation of a national programme that should help find a solution to manage pesticides out of specification by applying the principle of extended product responsibility to the producer/importer.

Pesticide container management.

A pilot programme planned by CAMAGRO to deal with pesticides containers is being developed as of the year 2005. The earliest evaluation conducted during implementation phase one has shown positive results.

For further strengthening actions in this area, the present project has been geared towards improving sensitisation and awareness processes at the level of producers, on the importance of implementing a triple wash.

Likewise, the Responsible Production Project of MGAP has promoted actions with the objective of building storage centres, which will permit the extension of the shelter area in the first stage of implementation.

4.6.3 Unintentional emissions

Initial measurement process in the industrial sector

In the course of the project development, both state and private enterprises linked to productive sectors, which are potential generators of unintentional emissions have begun actions in order to measure dioxins and furans in their emissions and waste.

EIA Regulations Amendments extending scope of application

Within the framework of the process that took place in 2005 for the amendment of the Regulatory Decree of the Law on Environmental Impact Assessment, the project has contributed by proposing a series of amendments that should facilitate the implementation of the plan.

The following are the outstanding amendments introduced to the EIA regulations:

- Introduction of new instruments, such as the Authorisation for Operating and the Special Environmental Authorisation, the latter can be applied to existing activities. These new instruments become a key factor in order to improve the control and adjustment of Best Available Techniques.
- Widening the scope of application in the industrial sector by incorporating activities (among others which subject to the regulations of the Prior Environmental Authorisation and Special Authorisations) of the productive sector that involve a group of priority substances and activities related to metal smelting.

Irregular settlements programme

While the Project was developing, the project team identified the residents of irregular settlements as people being very vulnerable to the exposure of POPs.

Practices of waste-burning in the open, as well as the particular development of illegal settlements in areas potentially contaminated by urban solid waste and/or industrial solid waste, are some of the reasons that called for action in this area.

Within the context of the present project, a collaboration plan with the Irregular Settlements Integration Programme (PIAI) has been started in order to improve the population insight about the risks associated to waste management and promote the application of alternative practices. Moreover, the project team collaborated with PIAI for the environmental characterisation of sites where regularisation projects designed to prevent and minimise the residents' health risks were being executed.

The result of this collaboration is considered extremely successful. The strengthening of PIAI program will facilitate the implementation of specific measures in the areas of environmental sensitisation and characterisation of the sites to be regulated.

4.6.4 PCB

Stockpiles Management

UTE has continued with the management of stocks of dielectric oils contaminated with PCB, with the intention of sending the second batch for elimination abroad, in the course of the year 2006.

Within the framework of the plan conducted for the development of the NIP, the coordinating actions aimed at waste stockpiles have been reinforced.

PDF-A Project approval

Based on the needs detected in relation to identification and stockpiles contaminated with PCB, Uruguay started to develop a MSP in order to reinforce the national capacities to manage PCB in an environmentally sound manner, counting on UNDP as implementing agency through a PDF-A financed by GEF funds.

The activities outlined in the project are expected to begin in July 2006. Chapter 6 contains the

full text of the project that was submitted and approved.

4.6.5 Contaminated sites

National Capacity Building

The development of the present project allowed the continuity of the process that was begun by DINAMA in 2002 to build on the capacities of key institutions regarding the identification and management of contaminated sites.

During the project execution, a series of regional seminars were held in order to spread the news about national experiences, sensitise people as to the risks involved in contaminated sites, and begin the training of local and national governmental technicians to identify and make assessment on contaminated sites. To support these processes, material concerning information and training was prepared.

Inventory of potentially contaminated sites

Within the framework of base line development, which provided the basis for the proposed measures in the Plan, an inventory of potentially contaminated sites by POPs and other relevant persistent toxic substances was made. This information integrates a consolidated database especially designed for the project.

Interventions made at the public and private levels

While the project was developing, interventions took place in the private sector, being especially worth mentioning the initial characterisation process of an industrial site potentially contaminated with mercury and the remediation of a chemical plant devoted to the formulation and commercialisation of POPs pesticides (Aldrin, Dieldrin and DDT) from 1960 to 1990.

Simultaneously, as mentioned in section 4.5.3, support was given to the design and execution of the environmental characterisation processes in irregular settlements and recommendations to minimise risks were presented for their future incorporation into the regularisation project.

4.6.6 Solid Waste Management Enhancement

A series of actions included in the area of waste management, within the context of the present project, have been initiated. They will have favourable repercussions on the reduction of unintentional emissions as well as on the generation of contaminated sites.

Among these actions, the following are the most important ones:

- The elaboration of a proposal to regulate the integrated management of solid industrial, agro-industrial and services-related waste has been completed. This regulation is about to be approved.

- The project “Master Plan for Solid Waste Management in Montevideo Metropolitan Area” was finished in December 2005, although the search for financing its implementation is still pending. This Master Plan constitutes a key factor to improve waste management based on the existence of a comprehensive system that also covers the adoption of technical criteria, the installation of adequate infrastructure, and a number of inter- institutional agreements.

- In addition, the country has started to develop special waste management systems focused on the application of the extended responsibility principle. With regard to this, the system designed to take care of the lead-acid battery residues has been regulated and in operation, while the regulations corresponding to the Containers Law, which mandates the producer/ importer to install a waste containers management system, are still in draft form.

4.6.7 Sensitisation and Training on POPs and Other Chemical Substances

Within the frame of development of the National Implementation Plan, progress was made in the implementation of phase one of a Communication, Sensitisation and Training Strategy, mainly addressed to the formal educational system and civil society organisations.

Varied activities such as workshops and seminars focused on sensitisation and training were planned and a form was designed to help identify the needs of participants and to assess the information people possess as to POPs.

After reckoning the needs, a Project was developed to create educational games and material aimed at students and teachers within the formal primary and secondary levels of education. The conceptual framework is based on the environmentally sound use of chemicals in daily life and the hazards associated with them.

Another essential sector identified is that of residents of irregular settlements whose main economic activity is the collection and classification of garbage. Due to the lack of information on the matter, waste is mishandled. People tend to burn, bury or discard it along the riverbanks. Considering this, jointly with PIAI, the Project team organized a workshop where notions and concepts relative to domestic solid waste management were shared, focusing on methods for minimising environmental and human health risks.

5 Mechanisms for the Implementation, Assessment and Permanent Follow-Up of the Plan

5.1 OVERVIEW

The implementation of the Plan must necessarily be accompanied by an ongoing evaluation process that may help check progress with regard to the targets set and detect any deviations from the plan originally drawn up, so as to correct the course of action whenever appropriate. The follow-up and control system must be designed prior to the implementation of the Plan itself. Indeed, it is necessary to gather information in advance in order to formulate monitoring and assessment indicators.

The Plan's follow-up and evaluation represents an essential management tool for decision making, as it makes it possible to measure the results and impacts of the actions taken, as well as to identify any change and/or update required.

An indicator is a preferably quantitative "variable" designed to provide key information on the degree of compliance with a pre-established target and on the effectiveness of the implementation of one or a series of actions. Indicators must measure and clearly reflect the progress of the system by recording the evolution thereof so as to make it possible to focus on key aspects. The reliability of an indicator depends in turn on the quality of the information it is based upon.

An indicator must have at least the following characteristics:

1. It must be possible to verify objectively.

2. Its formulation, as well as the way in which the results are to be construed, must be clearly specified.

3. It must not be complicated. The follow-up procedure must prove feasible. Most importantly, the actions required in order to generate the source data needed must by no means be as elaborate as the very action or programme to be assessed.

To draw up the monitoring and follow-up plan, it is therefore essential to have reliable information on the indicator's start-up baseline, sources and construction procedure, as well as effective feedback mechanisms for the purpose of decision making.

The indicators selected for following up this Plan fall into the two categories below:

- **Execution indicators** for evaluating compliance with the actions planned in the various programmes.
- **Efficiency indicators** for assessing compliance with the targets set.

The execution indicators for each one of the actions in the programmes making up the Plan are discussed under Section 4.

The preliminary formulation of the efficiency indicators is discussed under sub-section 5.3 herein.

Notwithstanding the formulation of indicators, it must be borne in mind that information itself represents the actual foundations for collective, transparent action as it paves the way to agreements by minimising misunderstandings. In order to meet this objective, information must be reliable, thorough and timely.

5.2 PROPOSAL FOR ADDRESSING THE IMPLEMENTATION, EVALUATION AND PERMANENT FOLLOW-UP OF THE PLAN

In order to carry out the National Plan, the Technical Advisory Commission for the Protection of the Environment (COTAMA) should undertake the coordination, evaluation and follow-up of the Implementation of the Plan. The fact that it is composed of representatives from multiple public and private institutions makes it the natural scenario for such tasks. On the basis of the evaluation made, COTAMA may suggest changes in policies and/or strategies for action implementation. COTAMA can further appoint specific work groups thereby adding actors to its original members.

Meanwhile, DINAMA (MVOTMA) should play a role in the planning and coordination of those actions and projects arising from the Plan. To that end, DINAMA shall establish a technical NIP Follow-Up Unit composed of:

- GEF's political and operational centre (2 delegates)
- 2 (two) representatives from the Environmental Control Division.
- 1 (one) representative from DINAMA's Legal Advice Department.
- 1 (one) representative from DINAMA's Planning Unit.
- 1 (one) representative from DINAMA's International Affairs Advisory Department.
- 1 (one) representative from the Environmental Quality Assessment Division.

The follow-up unit shall further be responsible for issuing and submitting the corresponding reports to the consideration of COTAMA by the deadlines established, for the purpose of informing the Conference of the Parties. The Plan Follow-Up Unit shall develop efficiency indicators on the basis of the preliminary formulation described herein.

It is established on a preliminary basis that every two years the Follow-Up Unit shall assess the implementation of the Plan and shall submit to the consideration of COTAMA the findings of such assessments.

5.3 PRELIMINARY FORMULATION OF EFFECTIVENESS INDICATORS

Selecting monitoring and evaluation indicators that may adequately reflect the effectiveness of the actions planned is indeed a hard, complex task. On designing a Plan evaluation and follow-up system it should be borne in mind that gathering information entails an added cost. Such cost should be reasonable, that is to say, the cost of collecting information in terms of economic resources and time should make measurements feasible and should further match the importance of the indicator to be assessed.

Prior to the indicators' follow up it is necessary to define the measurement information system. This, in turn, entails defining the aspects described below:

1. What is to be measured (variable);
2. How it will be measured (indicator);
3. How the information will be gathered (inventories, polls, records, statements, etc.)
4. How the information obtained will be processed.

Indicators can be designed for different specific objectives. The project has defined the following objectives for this stage:

1. Report on the reduction of risks POPs and other priority substances entail for human health and the environment.
2. Report on the level of compliance with specific obligations under the Stockholm Convention.
3. Assess the degree of compliance with the rules and regulations relevant to the development and implementation of the Plan.
4. Assess the degree of compliance with the elimination of obsolete pesticides and PCB stockpiles.

5. Report on the levels of unintentional emissions and evaluate the reasons for the trends observed.
6. Evaluate national capacities for the sound environmental management of substances, waste and contaminated sites.
7. Report on the management of waste, further informing the degree of improvement accomplished.
8. Evaluate the population's degree of awareness about the risks chemical substances entail.
9. Obstacles hindering compliance with the actions planned.

Table 5.1 illustrates a first approach to the formulation of efficacy indicators.

Table 5.1 Preliminary Approach to Efficiency Indicators.

Aspect to be Assessed	Preliminary Formulation of the Indicator / Necessary Information
Reduction of the risks POPs and other priority substances entail for human health and the environment.	• Evolution of POP levels in human and environmental matrices and food. The indicator depends on the execution of the monitoring and surveillance activities planned. • Results of the exposure risk assessments. The indicator depends on the generation of nationwide capacities to carry out risk assessment surveys.
Degree of compliance with the specific obligations arising from the Stockholm Convention.	• Number of duties performed./Total number of duties or obligations undertaken. • Type of action not taken (not complied with). • Reasons for non-compliance.
Degree of improvement accomplished in the management of toxic waste.	• Survey of the infrastructure for toxic waste treatment and final disposal. • Rate of toxic waste generation by sector. • Final destination of the waste generated. • Percentage of waste burned in the open air.
Degree of unintentional emissions and evaluation of the reasons for the trends observed.	• Amount of annual unintentional emissions (inventory of dioxins and furans). • Relative weight of each sector. • Reasons identified for increase or reduction.
Degree of compliance with those rules and regulations relevant to the development and implementation of the Plan.	• Number of individuals and companies subject to the regulations who actually abide by them./ Total number of individuals and companies subject to the regulations.
Degree of community awareness about the risks involved in chemical substances.	• Degree to which the population approves the quality and quantity of information. (Procedure: public opinion poll.) • Evolution of the information available, which can be measured by means of fortnightly diagnostic procedures.
Degree of compliance with the elimination of obsolete pesticides and PCB.	• Amount eliminated in an environmentally sound manner. Amount of off-spec pesticides and PCB recorded in the inventory or estimated.
Institutional capacity for the environmentally sound management of substances, waste and contaminated sites.	• Economic resources assigned to the area. • Human resources assigned to the area. • Training level of the human resources assigned. • Installed analytical capacity survey.
Obstacles that hinder implementation.	• Identification of implementation obstacles and assessment of the significance thereof.

6 Conceptual Framework for Phase One Projects

This chapter contains Phase One Projects elaborated while the Plan was being formulated.

They cover the main action lines contained in the Plan and, accordingly, they do not represent a final list. Projects introduced in this chapter have attained different levels of progress. Some of them correspond to approved PDF-A (that is the case of capacity building projects relative to environmentally sound management of PCBs in Uruguay and the Information System on chemical substances).

They correspond to the priorities identified in the framework of the Project and require the contribution of international cooperation funds for their execution.

The following Projects are presented in relation to approved PDF-A:

- Capacity building relative to environmentally sound management of PCBs in Uruguay.
- Information system on chemical substances.

Projects currently under preparation:

- Globally Harmonized Classification and Labelling System for Chemical Substances.

Phase One Projects not yet submitted to funding agencies:

- Registry of Pollutants Transfer and Releases (RPTR).
- POPs monitoring in environmental matrices and foodstuffs--Dioxins and Furans component and dioxin-type PCB.
- National Monitoring System, Control and Surveillance of POP Pesticides and other priorities.
- Institutional capacity building for the identification and environmentally sound management of sites contaminated by Persistent Organic Pollutants.
- Promotion of Best Technologies Available and Best Environmental Practices.
- Environmentally sound management of Solid Waste.

Though the need for a project related to social and economic evaluation was identified, this project has not been designed yet.

Projects in the process of being formulated

TITLE OF PROJECT: Development of an MSP for an Integrated Information System, identified as a priority area during the formulation of the National Implementation Plan for the Stockholm Convention, (NIP).

1. Global Significance + Problem Statement

Within the organic chemicals, the so-called persistent organic pollutants (POPs), present severe global risks to human health and the environment due to their toxicity, their persistence, their capacity of bioaccumulation and their capacity to be transported over long distances on air and water currents from the point in which they were used or emitted. These properties and particularly their free circulation due to the "grasshopper effect"[1], turn the presence of POPs into a global threat, for POPs can travel long distances and become widely dispersed in a matter of days or weeks on air currents, and more slowly in rivers and ocean currents.

This group includes some of the world's most harmful chemicals, notably highly toxic pesticides such as DDT; industrial chemicals such as PCB; and unintended by-products of industrial processes and incineration such as dioxins and furans. The situation in Uruguay is not different at all, since it has environmental liabilities already taken into consideration for reduction.

During Stage II of the NIP, several surveys were carried out in Uruguay as tools to meet the objectives of the Stockholm Convention. These surveys showed basic limitations in terms of substance management information at a national level. Management information in Uruguay is dispersed and is not used as a tool for integrated management, since its use is limited to the agencies that generate this information. Most of the information is unprocessed, which means that obtaining information on the life cycle of the substances in Uruguay would entail high costs and time-consuming compilation and processing procedures. Apart from these limitations, the present situation only relies on isolated controls for some stages of the life cycle of substances. It is strategically important to interconnect these controls.

Having accurate, reliable information which contributes to give a global vision and is presented in an adequate format is key, not only to make correct and timely decisions but also to inform the society and those who use the substances in question. (Art. 3, 6, 10)

Considering the accelerated evolution of the different scenarios and the evolution of the Stockholm Convention itself, it is essential that the actions taken attack the problems related to POPs with enough specificity, combined with other actions in this area, thus promoting synergies and rendering them applicable to chemicals management.

This shows the need to generate an integrated information system that concentrates the information relative to substance management, especially POPs in Uruguay and which can also be used as a basis for control actions at both regional and global levels, minimizing the risks these substances entail.

Finally, during the preparation of the National Implementation Plan (NIP) it was found that the stakeholders (users, communities, industries,

1 POPs, when released into the environment, can travel by air and water far from their origins. This typically consists of a number of "hops", each consisting of three stages: (i) evaporation, (ii) transport in the atmosphere and (iii) condensation at lower temperatures—the so-called "grasshopper effect".

NGOs, trade unions, etc.) have no real knowledge about POPs, their uses, effects and substitution alternatives. This is exactly where the Training and Awareness-Raising Strategy comes in as a fundamental element to reach the public, acting as a two-way link between management and the public. Informing and raising the population's awareness about the risks and the problems that arise in relation to the life cycle of chemicals is crucial for them to change their behaviour and attitudes when choosing, using, trading and disposing of products; to become responsible consumers and to actively participate in the discussion and decision-making processes. It is fundamental to raise awareness and to inform the population in order to ensure the sustainability of the actions and to attain the goals set forth in the Stockholm Convention.

2. Project Linkage to National Priorities, Action Plan and Programmes and CP/GCF/ RCF, CCA and UNDAF situation analysis

The Integrated Information System proposed in the project contemplates the national priorities regarding environmental management. As it arises from Article 7 of Law 17,283, "information is a source of environmental management" and having accurate, reliable information which contributes to give a global vision and which is presented in an adequate format is a key factor for adequate environmental management. This is why a point is made on the need to create an Integrated Information System that concentrates all the information related to the substances that are imported, used, generated and disposed of in Uruguay, including all products, wastes and agents that might contain them. This system should also be open to articulations with other dimensions of environmental management information.

Likewise, the above also responds to the needs identified during the preparation of the NIP for Uruguay. The second stage of the preparation of the Plan, which corresponds to the update of a national substance profile and the collection of inventories for each one of the areas covered by the Stockholm Convention has already come to an end. The information-collecting process showed that the same is dispersed, that it has substantial gaps and it is very frequently not up-to-date, as it arises from the inventories. Thus, the creation of an integrated information system constitutes a priority for permanent data updating and to facilitate the follow-up of the operations, thus providing a more solid basis for control and decision-making. Such a system would be a substantial contribution for the sustainable fulfilment of the Stockholm Convention and to rationalize resources.

3. Stakeholders and Beneficiaries involved in the Project

The main stakeholders generate the information for decision-making and control:

Institution	Competency area	Function
MVOTMA/DINAMA: Ministry of Housing, Use of the Land and the Environment/National Directorate for the Environment	Environment, coordinator and subsidiary in chemical substances	Environment, Management of the integrated information system.
MSP: Ministry of Public Health	Human Health	To incorporate the information generated by the epidemiological surveillance programmes.
MEF/DNA: Ministry of Economy and Finance/ National Customs Directorate	Trans-border operations with chemical substances.	To collect information about trans-boundary operations.
MGAP: Ministry of Livestock, Agriculture and Fisheries	Agricultural and forestry sector.	To collect information about the registration, use, application and storage of agricultural substances.
MIEM: Ministry of Industry, Energy and Mining	Not defined within the present framework.	To collect information about industrial activities that use or generate POPs or similar substances.
MTSS: Ministry of Labour and Social Security	Worker's and working environment health and safety.	To collect information about exposure to POPs and other substances at work, detection of other points to be dealt with regarding occupational users.
MTOP: Ministry of Transport and Public Works	Transportation of hazardous goods.	To collect information about the transportation of POPs and other hazardous goods.
MI/DNB: Ministry of Interior / National Fire Brigade	Chemical Contingencies / Warehouse approval	To collect registers and information about stakeholders and infrastructure related to the use of POPs and other substances, in terms of infrastructure safety and contingency plans in case of accident.

The Beneficiaries of the system shall be:

- Executive Power agencies with competence in the field of chemicals control;
- Different sectors of economic activity (Industry, Agriculture, Trade, etc);
- University, research and technology transfer institutions;
- Consumers, workers, trade unions, stakeholders, NGOs and the society as a whole;
- Health institutions and personnel and contingency-response organizations;
- International agencies and conventions in Uruguay.

The processed information shall be used as input to identify priorities and to outline and strengthen the education and awareness-raising strategy to cooperate with each interest group according to their needs and priorities.

Finally, the project shall be beneficial for the global environment and for the community, since it shall strengthen the national capacities in conformity with the Stockholm Convention.

4. Rationale for GEF Involvement and Conformity with GEF Operational Programmes and Strategic Priorities

The present proposal is classified within Strategic Priority I: Targeted (Foundational) Capacity Building. In addition to facilitating awareness-raising among the different stakeholders involved in the implementation of the Stockholm Convention, the POP Integrated Information System will allow the organizations leading the process to have a system to effectively manage, use and disseminate the information on POPs for decision-making processes. Counting on an adequate system to manage information will also allow Uruguay to participate effectively in the exchange of information with other Parties of the Convention.

The Integrated Information System will also meet the eligibility criteria stated in the Operational Programme #14 established by GEF for POPs as this project is classified as capacity-building.

The Integrated Information System will be an institutional mechanism for the integrated management of POPs as it will allow, on the one hand, access to quality data not existing at present, and on the other hand and even more importantly, it will allow the government to undertake the coordinated control in a single national strategy which shall benefit from the specialized contribution of each institution.

In addition, information cross-checking through the Integrated Information System will enhance the Government's capacity to monitor and enforce compliance with regulatory controls.

Furthermore, integrating the efforts of all the different relevant institutions shall strengthen human and institutional capacity to address the threats posed by POPs, including capacity to generate and share information both effectively and in due time.

The Training and Sensitization Strategy included in this proposal is also an eligible capacity-building activity stated in the OP 14 ("Developing and implementing public awareness /information / environmental education programs") and will be implemented pursuant to Article 10 of the Stockholm Convention.

5. Expected Goals, Objectives and Outcomes of Final Project and Relevance for outcomes of CPD and UNDAF

General Goals

The general Goals of the final project are to install the National Integrated Substance Information System in Uruguay, based on free software, in order to promote, harmonize and articulate inter-institutional participation in substance management and for it to be used as a source of information for the stakeholders involved and the society as a whole.

Specific Goals

- To make information more easily available and more accessible at a national level;
- To improve the existing data systems and the analytical capacity;
- To improve the quality of the information used;
- To research, adapt and introduce management methodologies that allow for the assessment of environmental conflicts arising from POPs and other substances;
- To study possible mechanisms to generate and update information, including environmental and human monitoring programmes;
- To develop mechanisms to geo-reference information in order to be able to associate the presence of pollutants in the environment and their effects on human health and the environment;
- To implement adequate procedures and techniques to identify and access data sources to support control;
- To unify data generation and collection criteria in order to achieve comparable and compatible levels of detail;
- To rationalize and optimise the resources assigned to chemical substance management;
- To achieve the involvement of the competent agencies and the participation of social stakeholders involved;
- To strengthen the participation of the organized civil society through the information system;
- To give support to the formal education sector for environmental education regarding substances;
- To inform and train the direct users of these substances.

Activities and Products

	Macro-activity	Product
FORMULATION	Agreements and Negotiation	Agreements for information accessibility, access levels, processing and publication.
	Extensive collection of data generated at present by management	Inventory of generated data and characteristics of the information .
EXECUTION	Conceptual design	Logical scheme (conceptual) of the information system.
	System architecture	Programming the mechanisms of information collection, processing and availability.
	Testing	Launching the pilot experience.
	Launching	Totally operative system. Training the users of the system
	Proposal and community involvement diagnosis	Diagnosis of the problems related to citizen involvement and elaboration of proposals for action plans.
	Implementation of a sensitization system	Improvement of the community's sensitivity regarding the risks chemical substances entail.
	Training and sensitization strategy	Training groups of direct substance users.

6. Description of Formulation Stage

In the course of the Project formulation, the Agreements and Negotiation and Extensive collection of the data generated by the management stages, will be developed. The institutions participating in the Integrated Information System shall be those participating in the NIP National Committee among others. Advances have been made in the contacts. A consensus has been reached between the institutions regarding the fact that the unavailability of the information is an obstacle for the management of POPs and other substances.

The following activities shall be carried out during the project preparation stage:

- Contract of **two national consultants and four assistants** to work together with and receive instructions from the **NIP-DINAMA Project** Coordinating Unit on the following subjects:
  - Initial characterization of the information managed by each of the agencies involved in order to monitor their needs and for an adequate management of the information. This includes: identification of the technicians who handle the information, identification of the kind of information handled, information registration means, information quality, frequency of the updates, filing system, relevance and priority of the information for each of the organizations.
  - Agreements to work with institutions involved in the integrated information system.
  - Establishment of a work plan which includes objectives, the expected outcomes, the activities to meet objectives, the people responsible for each one of the organizations and the schedule (contents of the table in Section 5), in coordination with the agencies.

- Formulation of the MSP based on the results of the points above, which shall be carried out by an **international consultant.**

PROJECT TITLE: Development of an MSP on National Capacity Building for the environmentally sound management of PCBs in Uruguay, a priority identified during the formulation of the Uruguayan NIP.

1. Global Significance + Problem Statement

Among the group of organic chemical substances, those known as persistent organic pollutants (POPs) present several global risks to human health and the environment due to their toxicity, their persistence, their capacity of bioaccumulation and their capacity to be transported over long distances through air and water currents from their point of emission or use. These properties and most particularly their free circulation due to the "grasshopper effect"[1], , turn the presence of POPs into a global threat, as POPs can travel long distances and spread out broadly in a matter of days via air currents and more slowly via rivers and sea currents.

This group includes some of the world's most harmful chemicals, highly toxic pesticides such as DDT; industrial chemicals such as polychlorinated biphenyls (PCBs) and unintended by-products such as dioxins and furans.

PCBs are a group of 209 organochlorinated congeners, notable for their great chemical, thermal and biological stability. These properties have caused PCBs to be used for many years by the industries in several commercial mixes, among which are askarels, arochlors, pyranol and others. Their excellent properties as electric isolators and their high combustion point have caused them to be used mainly (over 60% of the total) as dielectric oil in transformers and condensers. Among their less relevant uses, they are found as hydraulic fluids in vacuum pumps and thermal-transference oil, plastifyers, lubricants, cement additives, inks, etc. Many countries banned their manufacture in the early 80s. In spite of this, the extended life-cycle of transformers and condensers, which in some cases is over 40 years, has caused the problems related to the management and destruction of these substances to persist.

Due to their toxicity, their high persistence, their concentration in the food chain and their global dispersion, their impact on health and the environment may be serious if they are not adequately managed. PCBs have several different impacts on health, mainly depending on their degree of exposure, causing alterations in the endocrinal, reproductive, nervous and immune systems, as well as damaging the liver, causing conjunctivitis, chlorine-related acne, etc.

The Stockholm Convention on Persistent Organic Pollutants proposes, among the measures to minimise the risks for human health associated with these pollutants, the complete elimination of PCBs by the year 2025.

In Uruguay, the only compounds included in the Convention that are still in use nowadays are PCBs, with the exception of involuntarily generated POPs. Their main use is the one related with the existence of capacitors and transformers with dielectric PCB oils or those contaminated with said compounds. There is no legal framework to regulate to the management of PCB-contaminated equipments and oils, and their entry, commercialisation and use have not been regulated yet.

From the basic studies carried out in the framework of the project for the formulation of the "National Implementation Plan for the Stockholm Convention" it is possible to estimate that in Uruguay there exist nearly 42,000 transformers, 95% of which belong to the State power utility

1 When POPs are released into the environment they travel in the air and water and reach points that are very distant from those where they originated. This process occurs in "leaps", each leap consisting of: (i) evaporation, (II) transportation in the atmosphere and (iii) low-temperature condensation--this effect is known as "grasshopper effect".

(UTE) and the remaining 5% of the operating transformers belong to small and medium-sized companies which own between 1 and 5 transformers each.

Despite the fact that 35 % of the transformers used in Uruguay are of national origin and PCBs were never used in the national industry as dielectric oil, it has been found that a great proportion of these transformers might be contaminated with PCBs as a result of bad management by the maintenance firms, since many of the latter do not use adequate PCB-management policies and there is no legal framework to regulate their use. The inventory and characterisation of all the transformers in the country has not been elaborated yet, due to the difficulties of analysing the PCB contents of each one of the existing pieces of equipment.

UTE has an oil and PCB-contaminated equipment management system which is supervised by the company's Environmental Division. Since 1997 it has issued regulations to ensure the new equipment acquired is PCB-free (with a concentration under 2 ppm). The state company has analysed the PCB concentration in high-power transformers used for generation and transmission and of each piece of equipment that is withdrawn either for maintenance procedures or to be replaced. However, there are a great number of transformers in the distribution network (about 36,000 pieces of equipment) which have not been monitored due to the lack of resources (human resources and laboratory capacity to supply the demand) available in the country to carry out this evaluation within a reasonable period.

Regarding the management of this kind of wastes, it must be stated that Uruguay does not have enough infrastructure installed for the treatment of hazardous wastes or PCB-contaminated wastes. This is why UTE exports equipment and pure PCB oils (with concentrations over 500 ppm) to be destroyed in Europe. Due to the costs of the exports and the lack of a mechanism to simplify the export logistics, this process is slow and complex and only one export of equipment has been made so far, the second one being underway.

According to the estimations made in the "National Implementation Plan for the Stockholm Convention" project, it is possible to predict that most of the PCB-contaminated pieces of equipment have a PCB concentration below 500 ppm, the export of which would not be economically viable. UTE has decided to manage these oils at the thermoelectric station, as a temporary measure, previously conditioning them to be entered as alternative fuel. However, the environmental assessment of this option still needs more careful consideration.

The lack of national capacity for the treatment of these wastes marks the need to assess the most plausible treatment alternatives for Uruguay's reality from the technical, economic and environmental point of view, so as to design the corresponding development component.

The PCB information-gathering process within the formulation of the National Implementation Plan, allowed for the identification of abandoned pieces of equipment, many of which belonged to companies that have gone bankrupt and, should they need to be destroyed, their destruction would be the State's responsibility.

Finally, even if DINAMA and UTE have a clear picture of the life-cycle of PCBs in the national territory, the users and the general public have no information about the risk associated with the inappropriate management of PCBs. Thus, the need to implement a sensitization and awareness-raising program has been identified.

All the reasons above have led to identify the need to formulate a plan for the integrated management of equipments and oils which contain PCBs as part of the National Implementation Plan for the Stockholm Convention which allows to develop the national capacities to identify and manage PCB-contaminated wastes and to develop the necessary tools for the safe management of equipments and waste.

2. Project Linkage to National Priorities, Action Plan and Programmes and CP/GCF/ RCF, CCA and UNDAF situation analysis

Law Nº 17.732, dated December 31st, 2003 approved the Stockholm Convention on Persistent Organic Pollutants and its annexes. By virtue of this ratification, Uruguay undertook to comply with the obligations established in the same, using the mechanisms provided. Thus, activities have been launched aimed at the elaboration of the National Implementation Plan (NIP) for the Stockholm Convention, which show the aims and national actions to improve the management of chemical substances during their life-cycle, including the environmentally sound management of POP-contaminated wastes, and most particularly those which are PCB-contaminated.

Uruguay is currently at the last stages in the formulation of the National Implementation Plan for the Stockholm Convention which shall be ready by April, 2006. One of the national priorities to fulfil the Convention's aims, identified in the formulation process, is to generate the technical and analytical capacities and the specific regulatory frame necessary to eliminate all PCB-contaminated pieces of electric equipment. It is important to highlight that, with the exception of POPs, which are involuntarily generated, PCBs are the only compounds included in the convention which are in use in Uruguay and whose entry and commercialisation were never regulated.

Since the development of the environmental legislation, Uruguay has had the necessary legal bases for the environmental management of chemical substances and hazardous wastes and for the approval of the implementation of specific regulations. Actions have been launched within the framework of the plan's formulation, leading to the creation of a specific set of rules for the management and elimination of stocks and wastes with PCB contents, identifying the needs to implement actions leading to strengthening the national capacities for the management of wastes and stocks contaminated with these compounds.

3. Stakeholders and Beneficiaries involved in Project

The main stakeholders and beneficiaries shall be:

- MVOTMA as the competent agency in the environmental area and UTE as the main owner of equipment and oils with PCB contents, as project coordinators.
- Stakeholders involved in the different stages of the Project: Companies specialised in the maintenance of electrical equipments, National Customs Authority, National Ports Authority (ANP), Ministry of Transport and Public Works (MTOP), Uruguayan Chamber of Industries (CIU).

The beneficiaries of the project shall be:

- UTE shall benefit from the project, since as the main owner of PCB-related electrical equipment, it shall receive assistance and training for the monitoring of the equipment in the distribution network and the mechanism for the export of equipment and oils with PCB concentrations of over 500 ppm, will be simplified.
- All the companies which own equipment containing PCB, that are under the Stockholm Convention must eliminate said equipment by the year 2025 pursuant to the regulations for waste management and strengthening the national capacities for their management, including integrated actions between public and private companies.
- The firms which service transformers, since they shall receive training in PCB management, aimed at the reduction of the risk for their workers due to exposure and the negative impact on the environment due to malpractice.
- The population in general and the global environment shall benefit from this, since upon the implementation of a management plan which includes monitoring, traceability and adequate final disposal of equipments and oils containing PCB, as well as the detection of PCB-contaminated sites for remediation, the health and environmental risks from PCB contamination will be reduced.

- DINAMA is the agency in charge of preventing and controlling contamination and the coordinator of the implementation of the Stockholm Convention. As such, it shall benefit from this project through the development of its capacity to control and prevent impacts on the environment derived from the use and management of PCB-contaminated wastes, the development of techniques for PCB analysis in different matrices, thus being the national reference laboratory and developing tools for the adequate management of stocks and wastes derived from the elimination of their use.

The Project Development Funds (the present PDF A) will be beneficial for DINAMA and UTE since they shall have resources to gain more knowledge about the situation of equipments and dielectric oils with PCBs and the alternatives for the destruction of PCB-contaminated oils and equipments in the country.

Rationale for GEF Involvement and compliance with GEF Operational Programmes and Strategic Priorities

Building the national capacities for the environmentally adequate management of PCBs in Uruguay will be in accordance with the eligibility criteria stated in Operational Programme #14 established by GEF for POPs. This project is classified in the area of capacity building and on-the-ground intervention.
Concerning capacity building:

The project shall include activities aimed at developing the national capacity to analyse alternatives for the elimination of PCB-contaminated oils and equipments using the infrastructure available in the country and thus setting the requirements necessary for each alternative to be used in compliance with the international standards.

The development of tools and inter-institutional agreements with the main stakeholders involved (MVOTMA and UTE) shall improve the national capacity to implement the management measures included in the legal framework for PCBs to be developed by DINAMA.

Building the capacity of DINAMA's laboratory for PCB analysis in different matrices and developing UTE's monitoring capacity will increase the national capacity for PCB control, thus meaning an economically effective option for integrated management apart from the ones available at present.

The training of PCB equipment users in relation to the hazard and the adequate management of these equipments and the training of human resources in the key agencies involved in the different stages of the life-cycle of the electrical equipments is an activity eligible for GEF funding, among the capacity-building activities under OP4 (development of environmental education schemes).

The project also includes investment activities which are eligible for funding pursuant to GEF document OP 14 in the "on-the-ground intervention" area, taking into account that the activities developed under the project include:

- Identification, containment and stabilization of wastes that contain PCBs and related affected areas; and Environmentally sound destruction of wastes that contain PCBs where warranted, taking into account the assessment of the risks posed on ecosystems and human health and cost-effectiveness.
- Demonstrating viable and cost-effective alternatives to PCBs, and to the processes and practices that lead to the releases of PCBs; and Designing and implementing management programs to reduce the use of and ultimately phase out PCBs.

4. Expected Goals, Objectives and Outcomes of Final Project and Relevance to Outcomes of CPD and UNDAF

i) General Aim
The main aim of the final project shall be to create a National Plan for the integrated management of equipments and dielectric oils with PCB, including specific measures for each one of the

stages in their life-cycle (identification, handling, destruction) in order to avoid health and environmental risks, within the framework of the Stockholm Convention

ii) Specific Aims:

1. To assess and select the alternatives for the management of oils containing PCBs and facilitate the mechanism for the export of pure oils to countries with adequate technologies for their destruction.
2. To develop the national capacity for:
   - the destruction of PCB-contaminated oils,
   - the decontamination of contaminated equipment for their re-classification as PCB-free equipment or for the commercialisation of the scrap,
   - PCB monitoring and analysis, (capacity for laboratory analysis at DINAMA's laboratory and UTE's capacity to monitor the operating equipments),
   - Improving the coordination of stakeholders involved in waste management.
3. To design a strategy to simplify and promote the replacement of operating PCB equipments.
4. To train the users of PCB equipments on hazards and adequate PCB management and to strengthen the training of human resources in the key agencies involved in the different stages of the life-cycle of the electrical equipments.
5. To carry out a plan for the identification of those pieces of equipment which are out of use and mean an environmental liability, to implement containment measures for the most hazardous situations and to facilitate the final disposal through a mechanism in coordination with UTE.
6. To develop a programme to identify contaminated sites and to define the strategy for their decontamination.
7. To implement a monitoring, traceability and final disposal plan for electrical equipments with dielectric oil which belong to the State company UTE.
8. To support the implementation of the regulatory framework for PCB management by MVOTMA.

Activities and products

	Macro-activity	Product
FORMULATION	Agreements and Negotiation	Institutional agreement between MVOTMA and UTE to allow sustainability and project execution
		Coordinated procedure to export equipment and pure PCB oils within the framework of the Basel Convention by MVOTMA; UTE- Customs, ANP, MTOP and other institutions which have PCB-contaminated transformers.
	Evaluation of the information gathered in the NIP project and collection of additional information.	Evaluation report and identification of key aspects for the implementation of the National Plan for the management of PCB-contaminated wastes.
	Development of criteria to identify and prioritise PCB-contaminated sites	Plan for the monitoring of transformers in the distribution network with UTE
		Plan for the estimation of other PCB-contaminated equipments..
		Operation guide for transformer maintenance firms.
	Coordination workshops with key identified sectors.	Agreed preliminary measures
	Development of criteria to identify and prioritize PCB-contaminated sites	Plan for the characterization and evaluation of potentially PCB-contaminated sites.
	Support for the development of a set of regulations for PCB management of.	Approved regulations
	Project formulation	Project Document

	Macro-activity	Product
EXECUTION	Social-technical and economic evaluation of the management alternatives.	Proposal of alternatives to the management of these wastes, classified according to the PCB-contamination rank. Identification of the needs to strenghthen the national capacities for its implementation and execution. Setting technical criteria for each alternative
	Training human resources and awareness-raising.	Groups of trained and aware stakeholders.
	Developing DINAMA's analytical capacity for the determination of PCBs.	Installed analytical capacity for PCB determination id different matrixes.
	Monitoring UTE's transformer network.	Inventory of UTE's transformers started.
	Development of the inventory of PCB-contaminated sites.	Plan for the management of PCB-contaminated sites.
	Evaluation of other PCB-contaminated equipment	Estimation of other stocks and proposal to attend to the same.
	Formulation of the National Plan	National Plan for the integrated management of PCB-contaminated equipments and oils.

The National Plan must see to the implementation of at least the following aspects:

i. A mechanism to export PCB equipments and pure oils, with the agreement of all the key stakeholders.
ii. Defining one or several alternatives for the treatment and disposal of PCB-contaminated wastes, including the technical, economic and social assessment of the same and the plan for their implementation in the country (management mode, investment plan, etc)..
iii. A replacement strategy for transformers with PCB which matches the national situation and the national capacity building.
iv. A proposal of an inventory of other short and long-term uses using attention priority criteria depending on the risk level.
v. A plan to implement significant improvements in the management of PCB-contaminated wastes and equipment at the different stages of their life-cycle, including an assessment of the social and economic impact of the projected measures.
vi. A plan for the management of PCB-contaminated sites.
vii. The capacity-building needs of the different stakeholders including the capacity of human resources that allow for a simple implementation of the projected plan.

The global results of the execution of the final project will be:

- The reduction of the risks for human health and the environment due to exposure to PCBs.
- A reduction of the entries of PCB-contaminated oils and equipment in the informal oil and scrap-management circuit
- A reduction in the risk of cross-contamination of the equipments caused by the maintenance of the same.
- Entry of banned PCBs into the country.
- Mechanisms implemented to fulfil requirements and terms stipulated in the Stockholm Convention.

5. Description of Formulation Stage

In order to define the scope, terms and costs of some activities projected to be carried out in the MSP and as a preliminary phase of the Project it is necessary to:

- Reach agreements with UTE so as to be able to develop specific objectives with this company.
- Complete the development of the legal framework for PCB management including the management of used oils and identify other aspects which may be supplementary

to the ones already identified, in order to simplify their application

- Design a plan to monitor the distribution network transformers in coordination with UTE.
- Carry out workshops with the maintenance firms to assess their present status and to prepare an operations guide for such firms
- Carry out workshops with all the identified stakeholders in order to agree on the implementation measures.
- Carry out a preliminary evaluation of the national capacity to manage PCB-contaminated wastes, alternative technologies and to set the criteria and rules to develop the social and technical evaluation of the alternatives of treatment and final disposal of PCB-contaminated wastes along the project.
- Formulate a plan for the characterisation and evaluation of potentially PCB-contaminated sites, so as to be able to project a work plan for their characterisation, evaluation and for the definition of strategies.

Projects in the process of being approved

I GLOBALLY HARMONIZED SYSTEM FOR THE CLASSIFICATION AND LABELLING OF CHEMICAL SUBSTANCES

Agency: UNITAR / UNEP

1.0 Problem identification; relating project to national priorities, action plans and programmes.

With the exception of a few specific isolated cases, such as transportation, there is no such thing as a classification of hazardous substances. This implies a lack of definition in basic aspects that support the creation of a clear and sound regulatory framework.

Furthermore, diverse formats for **labelling** and safety data sheets for hazardous substances and preparations co-exist and there are no harmonized guidelines to guide their creation. Taking into account that good chemical hazard communication and information contribute to reduce environmental risks including threats to health, there is a need at the national level to have a system for the classification and labelling of chemical substances and to support their sound management.

It is known that labelling and safety data sheets are one aspect of substance management that can have a positive influence on POP management, as they grant a well-informed --and even a more responsible-- use of substances that will ultimately help alleviate POPs impact on human health and the environment.

In this context, the Globally Harmonized System is acknowledged as a tool to accompany and complement the implementation of the Stockholm Convention.

Therefore, the implementation of the GHS has been identified as a priority activity to be started during phase one of the Convention implementation, insofar as it contributes to:

- Enhance public health and environmental protection by adequately making **information available** on chemical hazards and risks, using an internationally validated harmonization;
- Provide a common ground framework that allows for **sharing information and experiences**;
- Curb the need to duplicate costly **evaluation and testing efforts** relative to chemical substances and products to determine their classification;
- **Facilitate international trade** of chemical substances whose hazardous nature have been duly identified and assessed following accepted international criteria.

Consequently, on August 23, 2005, the country organized a national activity to introduce the GHS tool and demonstrate the benefits that could derive from its implementation, together with an overview of the national, regional and international situation in this field. Further to this, potential activities to be undertaken in future were also tabled and discussed.

During the workshop, the role and commitment of participating institutions was highlighted and a conclusion was reached as to the national need to start the GHS implementation process in the framework of an integrated chemical substances management by means of a multi-sectoral and participatory process. In order to initiate this implementation process the cooperation of UNITAR was requested for the elaboration of the project.

2.O Conceptual definition of the project

In the context of international commitments taken up by Uruguay, the GHS is of significant influence on the bloc of chemicals and others.

The Stockholm Convention in its Article 10, item 3 (Public information, awareness creation and education), in particular, states that each Party should encourage industry and professional users to promote and facilitate the supply of information. The same Article in item 4 also refers to providing information on POPs and their alternatives, using safety data sheets, reports, broadcasting means and other mass media.

As regards the national regulations, the use of this tool aligns with the spirit of existing national regulations; accordingly, very few adjustments are necessary for its full implementation.

In particular, General Law for Environmental Protection (Nº 17.283), article 20 on Chemical Substances, is mentioned as it determines the life-cycle approach, covering production, labelling, storage, transportation, use and final disposal; and the Consumer's Defence Law, Nº 17.250, article 8, stating that products and services considered hazardous or harmful to health should provide clear and visible indications of such risks on the packaging.

The national GHS implementation would contribute to the following components that improve management of chemical substances thus helping minimize risks for the environment and human health:

Component	Aspects	Actors identified
Hazard classification and identification	Use of globally harmonized classification criteria that facilitate exchange of information and understanding of contents.	Competent agencies.
Hazard communication	**Labelling**: as immediate and quick source of information. **Safety data sheets**: in-depth information on identity, features, associated hazards and risks. **Training**: training of participants in different life-cycle stages of chemical substances.	Manufacturers, producers, users and handlers. Users and workers either in labour or household environments.
Risk Management / Setting Priorities	Facilitates evaluation and monitoring and provides basic harmonized information to conduct national risk assessments.	Competent agencies.

3.0 Objectives

General Objective

To implement the Globally Harmonized System for Classification and Labelling of Chemicals in Uruguay.

Specific Objectives

The specific objectives of the implementation are the following:

- To adopt a system for the classification of chemicals;

- To establish harmonized requirements and criteria in terms of labelling hazardous substances and preparations;
- To establish criteria for the creation of safety data sheets of hazardous substances and preparations, ensuring that information they contain is precisely what the user needs;
- To implement an adequate chemical hazard communication;
- To train actors and users to handle the tool.

4.0 Activities / Actions

- To define goals and activities to be accomplished by the tool at the national level;
- To agree on an implementation strategy relative to the scope in terms of substances or groups of substances or activity sectors involved;
- To agree on an organizational structure model;
- To agree on the role, functions of key actors (competent authorities, those who handle chemicals and the public);
- To define their function, links and integration vis-à-vis existing management tools and control mechanisms;
- To design a pilot experience and make the necessary adjustments for its implementation;
- To agree and validate a national proposal for the implementation of GHS.

5.0 Expected outcomes

- To harmonize labelling criteria and presentation of safety data sheets at the national level;
- To reduce risks associated to the use of chemicals by improving the degree of information reaching out to users of chemical substances;

6.0 Actors identified

MVOTMA/DINAMA
MSP
MGAP
MIEM
CAMAGRO
CIU
Importers

Conceptual framework for not yet submitted Phase One Projects

I POLLUTANT RELEASE AND TRANSFER REGISTER (PRTR)

Implementing agency: to be established later

Application of cooperation funds: to be established later

1.0 Identification of the problem, relationship of the project with national priorities, action plans and programmes

The "Pollutant Release and Transfer Register" is one of the tools identified by our country to accompany the implementation of the Stockholm Convention. It enables data to be gathered on emissions into the environment of potentially hazardous chemicals.
In its Article 10, item 5 the Stockholm Convention establishes that each Party shall give sympathetic consideration to developing mechanisms such as pollutant release and transfer registers, for the collection and dissemination of information on estimates of the annual quantities of POPs released into the environment or disposed of as waste.

Thus, this internationally recognized tool provides a framework for the exchange and publication of information and provides a mechanism to establish priorities, facilitate informed decision-making, control and prevention, minimizing environmental and health hazards. It also provides a national follow-up system to comply with valid regulations and commitments taken on in the international context. The various government, industrial, civil society and academic sectors and the public at large can access information gathered, systematized, and made available for use.

The PRTR also provides a platform to encourage the industrial sector to make changes towards clean technologies, application of best practices and reduction of pollutant emission and/or transfer. Uruguay is initiating a process to design a National Information System on Chemicals with the support of UNDP as implementing agency, through a GEF funded project. The need for this system was shown in a diagnostic made during the surveys carried out to build up national institutional capacity to manage chemical substances. This diagnostic concluded that the fragmentation of information and the difficulty in relating and linking data were limitations on overall management of chemical substances.

The application of the PRTR tool to limited groups of priority substances or sectors of activity, particularly for POPs, will enable mechanisms for prioritization to be fed, contributing to establish plans for substitution, elimination or restriction of substances identified as problematic on a national level and to identify control and monitoring points. In this respect progress has been made in the preparation of a priority list of substances, containing 257 chemical substances, among which the Stockholm Convention POPs (excepting those unintentionally produced), substances under the Rotterdam Convention and others of national or international importance.

2.0 Conceptual definition of the project

In the framework of the National Information System on Chemicals, the contribution of the PRTR tool is essential because in management, the quantification and estimation of pollutant emission and transfer still need to be developed, particularly regarding substances defined as priority on a national level.

In this framework it is expected that the design and implementation of the PRTR should

accompany the Stockholm Convention implementation process and that it should be developed as a module on pollutant release into the environment within the Information System on Chemicals considering that both share similar principles and use complementary conceptual platforms. Additionally, assessment of the tool is foreseen to provide follow-up on non-intentional emissions. Registry design must include the definition of POPs, regulatory aspects, the model to be adopted, methodology and consolidation of inter-institutional agreements, exchange mechanisms and modalities, dissemination and communication to the various sectors using the registry.

For this reason, the process of PRTR design has been conceived as a registry and component of the National Information System.

3.0 Objectives

General objectives

To implement a Pollutant Release and Transfer Register (PRTR) in Uruguay for the estimation, control and follow-up of release and transfer of priority substances or sectors of activity.

Specific objectives

- To design a PRTR adapted to the country's situation;
- To integrated (link) the PRTR tool to existing control mechanisms;
- To design mechanisms for public access to information on substance release into the environment;
- To improve information for decision-making regarding health and environment;
- To assess the use of the tool for follow-up on unintentional emissions

4.0 Activities/ Actions

- To define the tool's targets and functions on a national level, agreeing on a strategy for implementation regarding POPs in terms of substances or groups of substances or sectors of activity involved;
- To agree on PRTR mechanisms to attain the targets set out;
- To reach agreement regarding the nature (public or confidential) of information on pollutant release and transfer;
- To agree on the role, rights and obligations of key actors (responsible authorities and those operating with substances and the public at large) and define their integration regarding management tools already included in the Information System on Chemical Substances;
- To design a pilot project for priority substances and implement it;
- To agree and validate a national proposal for PRTR on the basis of the pilot project;

5.0 Project Results / Expected benefits

- Improvement of public information regarding pollutant release;
- Complementation and improvement of State entity integration;
- Strengthening of decision-making to control and assess emissions.
- Contribution to the definition of plans to substitute / restrict chemical substances

6.0 Identification of stakeholders

MVOTMA / DINAMA
Ministry of Public Health (MSP)
Ministry of Livestock, Agriculture and Fisheries (MGAP)
Ministry of Labour and Social Security (MTSS)
Municipal Governments

II Monitoring of Dioxins and Furans and PCB-type dioxins in environmental matrices and in food

Implementing agency: to be established later

Application of cooperation funds: to be established later

1. Identification of the problem, linking of the project to national priorities, action plans and programmes

In the framework of the National Implementation Plan for the Stockholm Convention, a survey has been made in the country of the situation regarding persistent organic pollutants. The need has been identified to determine levels of these contaminants in environmental matrices and food to provide a dimension of the problem and establish actions vis-à-vis the results. In the case of unintentionally generated POPs, no background information is available to determine their levels in any matrix. For POP pesticides, preliminary studies need to be strengthened.

The country has no analytical capacity for some POPs such as dioxins, furans and dioxin-type polychlorinated biphenyls. Due to the high cost of analyzing these pollutants, the development of a methodology to address them is required, to enable optimized resource use through the development of low-cost screening techniques to the enable presence of persistent organic pollutants to be rejected or confirmed and to determine in which sites and matrixes an analysis using conventional methods is necessary.

This need is based on the following considerations:

1. The National Environment Directorate made a national inventory of Dioxin and Furan sources and release in the year 2000, later updating it in 2002 and 2003. The survey of release sources has provided an estimate of sites potentially affected by industrial activities. Furthermore, there is scant information on a series of informal activities carried out in the country, mainly in shanty-towns where a high number of inhabitants are children and deficient sanitary conditions exists, make it a group at risk. Real data needs to be obtained on unintentional POP levels to determine possible impacts on the environment, including human health.
2. Uruguay is an agricultural country when a considerable number of agro-chemicals have been and are still being used, including some considered as POPs. Furthermore the forestry sector is increasing, involving the use of an important volume of chemicals in activities in this sector.
3. The country aims at implementing a series of measures towards reducing the generation and emission of unintentional POPs, therefore there is a need to have the capacity to monitor these pollutants to correctly assess measures to be implemented. This is a very relevant aspect given the effort they will involve.
4. On an international level, maximum content levels of certain POPs in food and other consumer products are being managed and therefore it is considered essential to strengthen national capacity to quantify these pollutants.

2. Conceptual definition of the project

In the framework of the necessary measures identified to comply with the Stockholm Convention and the assessment of their effectiveness, the generation of a capacity to monitor POPs in environmental matrices and in food is a basic tool. On the basis of the results of its application, complementary actions can be established aimed at reducing the levels of these pollutants, both in the environment and in the population.

3. Objectives

General Objective:

Build up national capacity to implement a national programme for the monitoring of unintentionally generated POPs in environmental matrices and food through the development of a methodology for sampling, analysis and application in a pilot area.

Specific objectives:

- To develop a methodology for environmental monitoring of POPs in environmental matrices and its validation through implementation in a pilot area;
- To develop a methodology to determine POP intake by the population through food consumption;
- To implement a training programme in Dioxin and Furan and dioxin-type PCBs monitoring and analysis techniques;
- To strengthen Uruguay's sampling and analysis capacity for the determination of POPs in various matrices, guaranteeing standardization of techniques and the quality of results;
- To promote the development and use of low-cost POP screening techniques;
- To establish methodological guidelines for POP sampling and control.
-

4. Activities/ Actions

- Continue with the assessment of the present capacity to monitor and analyze POPs and prepare a sustainable capacity-building plan which contemplates the national situation;
- Enter into inter-institutional agreements making the projected building capacity actions viable;
- Implement the Capacity-Building Plan;
- Establish measures for inter-laboratory technology transfer;
- Select low-cost techniques for screening and their development and validation through application on a pilot scale.
- Design and implementation of a phase one Training Plan
- Preparation of methodological guidelines for POP sampling and analysis

5. Expected results / benefits from the project:

- Strengthening of national institutional capacity to control POP emissions, monitor and assess POP levels in the environment and level of population exposure;
- Detect activities, zones, key population groups that will, through monitoring, enable an assessment and feedback to be made of actions implemented to eliminate or minimize POP release.

6. Identified actors

MVOTMA / DINAMA
MSP
MGAP
MTSS
Municipal Governments
University of the Republic (UdelaR)
LATU

III National System for monitoring, controlling and supervising Pesticides, POPS and other priority substances

Implementing agency: to be established later

Application of cooperation funds: GEF (PDFA/ MSP)

Agency: to be established later

1.0 Identification of the problem, relationship of the project with national priorities, action plans and programmes

Through Decree 375/005 of 3 October 2005, the Executive Power decreed a ban on the introduction, production and utilization of nine POP Stockholm Convention pesticides, added to the other previously applied regulatory instruments that introduced restrictions and bans on these substances. Although the tool ensures the elimination of new sources of release of these pollutants, consequences deriving from previous use or the presence, levels and trends in human, environmental matrices or in food have not been quantified. Furthermore, over the last few years changes have taken place in national agricultural production, giving rise, among others to a significant increase in the use of herbicides and insecticides, some of which have POP characteristics (for example, the insecticide known as Endosulfan). Furthermore, our country has not yet resolved the issue of pesticides used industrially, such as in the case of those used by the leather industry and by wood treating companies.

The future definition of new POP pesticides must be taken into account, where tools for prevention must be available and information generated on consequences on the environment, human health and food. In the framework of the Uruguayan NIP for the Stockholm Convention, a list has been drawn up of 167 substances defined as priorities and identified through the revision of inventories of substances subject to assessment, restriction or prohibition of use, prepared by national or international bodies. This list includes the 12 POP substances and others included in international conventions ratified by our country. On this list, 63 % are pesticides for agricultural, veterinary, domestic, sanitary and industrial uses, showing the importance of studying this group in particular.

Another aspect to be noted is that gaps have been identified in the level of pesticide control, fundamentally in the stage of use. Furthermore a scant level of knowledge has also been detected, caused among other reasons by very scattered information and, in some cases, by difficulties in accessing it.

The following table describes concrete cases of problems identified on a national level:

Area where critical situations were confirmed			
Environment	**Occupational health**	**Health of the population in general**	**Insecticide residues in food[1]**
• Detection of POP insecticide residues and others in water analysis carried out in rivers and streams. • Detection of POP insecticides and others in the soil.[2] • Fish deaths from washing equipment used in application of agricultural insecticides. • Recovering a considerable number of insecticide containers from rivers / streams	• Workers engaged in spraying from the air. • Non respect / ignorance of the period for re-entry to the crop. • Non-use of personal protection equipment by the workers spraying with pesticides.	• Complaints about spraying from the air over schools in rice plantation areas. • Increase in cases of intoxication with glyphosate[3]. • Serious cases of intoxication with Endosulfan. • Incidents in which a single pesticide could not be identified but where the use of a pool was known. • Incipient studies relating some chronic diseases with pesticide use.	• Evidence of deviation in the use of pesticides in fruit and vegetables. • Multiple residues in fruit and vegetables. • Non respect for the waiting time (between application and consumption).

In a specific zone of the national territory critical situations were identified regarding the health of the population, unstable working conditions and environmental impacts. Complaints have been received and studies carried out identifying these incidents with the use of pesticides in the locality. This situation covers all the areas

1 Ing. Agr. Fernando Gemelli. Presentación de resultados de Análisis de Residuos Biológicos en Frutas y Hortalizas Frescas, año 2005. Comisión Administradora del Mercado Modelo – Intendencia Municipal de Montevideo.

2 Personal Communication. Ing. Agr. Saturnino Núñez (INIA- National Agricultural and Livestock Research Institute)

3 "Exposición al herbicida glifosato: aspectos clínicos toxicológicos." (Exposure to the herbicide glyphosate: toxicological clinical aspects) Drs. Mabel Burger, Salomé Fernández. Department of Toxicology, School of Medicine, University of the Republic. Rev Med Uruguay 2004;20:202-207

The above paragraphs show the scope of the problem generated by the use of POP and other priority pesticides and the situation of national concern that has arisen. However, it is also important to consider that the public notoriety this has achieved has led to awareness on the part of the population.

2.0 Background

The examples mentioned here below are the type of experiments proposed in the project and should be strengthened and complemented.

The Ministry of Public Health (MSP) is carrying out a programme for epidemiological monitoring of organophosphorus pesticides, involving the monitoring at occupational level of workers and sprayers and surveying information on levels of Acetylcholinesterase, based on the methodology established in the MSP National Disease code. There are no facilities available to follow-up on other kinds of pesticides beyond the CIAT which treats intoxication, attacking the problem once it has arisen.

For its part DILAVE within the MGAP is carrying out a National Programme for monitoring biological residues in food of animal origin. It is aimed at controlling contamination of fresh and processed food of animal origin through the detection and quantification of biological residues (anabolic hormones, heavy metals, pesticides, chloramfenicol and sulphas, thyreostatics and anti-helminthics).

The Administrative Commission for the Uruguay River and the Administrative Commission for the Rio de la Plata have developed monitoring for pesticides in the waters. DINAMA, under an agreement with JICA and various municipal governments have been developing a pilot project for monitoring in some areas in the south of the country in the framework of the Project for Building Up Institutional Capacity for Water Quality Management.

Since 2002, the Municipal Government of Montevideo, through the Model Market Administration Commission has been carrying out an exploratory sampling of pesticide residues in fresh fruit and vegetables for human consumption.

INIA and the School of Science (UdelaR) have carried out isolated research work to quantify the impact of the use of pesticides on the environment, farmers and consumers. This work compared some impact indicators on the above mentioned elements. Brief models were used and analytical techniques adjusted.

A primary survey of industrial pesticides of industrial use has been made. The results indicate that POPs are not used in Uruguay to process leather and skins; however the use of sodium pentachlorophenate in wood treatment was identified, although the intensity is low. The above-mentioned activities have been undertaken from a thematic standpoint, in isolated institutional initiatives and not necessarily framed in a country-wide strategy to address the issue. This is an example of the type of activity that can be developed and of technical feasibility, showing a major potential that should be framed in a national strategy.

Furthermore, article 11 of the Stockholm Convention establishes that appropriate research, development, monitoring and cooperation pertaining to persistent organic pollutants shall be promoted and / or undertaken and, where relevant, to their alternatives and to candidate persistent organic pollutants, including aspects on their: sources and releases into the environment; presence, levels and trends in humans and the environment; environmental transport, fate and transformation; effects on human health and the environment; socio-economic and cultural impacts; release reduction and/or elimination; and harmonized methodologies for making inventories of generating sources and analytical techniques for the measurement of releases.

The countries are requested to support and further develop programmes for this purpose taking into account the need to minimize duplication of efforts, supporting national and international efforts to strengthen national scientific and technical research capabilities and to promote

access to, and the exchange of, data and analyses. The countries are also requested to undertake research work geared towards alleviating the effects of persistent organic pollutants on reproductive health and to make the results of their research, development and monitoring activities accessible to the public on a timely and regular basis; and encourage and/or undertake cooperation with regard to storage and maintenance of information generated from research, development and monitoring.

Article 10 of the Stockholm Convention, referring to Public information, awareness and education, marks the need to promote and facilitate awareness among decision-makers with regard to POPs.

3.0 Conceptual Definition of the Project

In view of the above, the idea is to develop a tool coordinating institutional efforts, making them more efficient and framing them in a nation-wide process with an integrating approach. The objectives of this project are framed in the Stockholm Convention NIP pesticide action plan for Uruguay. Our country is following a process for environmentally sustainable management of POP and other priority pesticides. We are seeking to improve environmental management of all pesticides during all the stages of their life cycle, finding ways of minimizing hazards and negative consequences on the environment and on human health in the framework of sustainable development.

A system for integrated POP pesticide and other priority pesticide management needs to be designed to carry out monitoring, control and supervision in the environment, human beings and food. Tools also need to be generated covering life cycle stages in those cases where they have not yet been prepared and already existing programmes must be built up in order to implement an integrated mechanism.

The scope of the project covers POP pesticides and priority pesticides, including those substances used for agricultural, veterinary, domestic and sanitary or industrial purposes, analyzing them from a life-cycle approach. For this purpose the present project involves two stages:

- A first stage of formulation, including the execution of the pilot plan consisting of entering into the necessary inter-institutional agreements and the design and validation of the methodology for monitoring.
- A second stage, during which the monitoring plan will be implemented at national level.

The project is expected to last 36 months from its initiation until full implementation and operation.

The major lines of action serving as basis support to the National System for monitoring, controlling and supervising POP and other priority pesticides have been defined by the following components:

- National programme for monitoring, assessing and supervising POP and other priority pesticides in the environment: designed.
- National programme for monitoring, assessing, controlling and supervising POP and other priority pesticides in the population at large: designed and implemented.
- National programme for monitoring, assessing, controlling and supervising POP and other priority pesticides in workers subject to exposure: strengthened and increased.
- National programme for monitoring, assessing, controlling and supervising POP and other priority pesticides in food: strengthened and increased.

4.0 Objectives

The following are the general and specific objectives of this project:

General objective

- To design and implement a system for monitoring, controlling and supervising POP and other priority pesticides in the environment, food and human health, particularly that of workers subject to exposure.

Specific objectives

- To generate tools to carry out continuous identification of the critical points associated to pesticide use, prevent the occurrence of damage and correct it, should it happen. In particular damage to the health of workers and the population at large, to the environment and food quality.
- To increase the level of knowledge on the behaviour of POP and other priority pesticides under local conditions.
- To improve the level of knowledge, through the generation of new information and gathering of existing information
- To improve the quality, accessibility and exchange of information handled
- To provide information for policy-making to address problems arising from pesticides in some stage of their life cycle.
- To adjust and harmonize sampling and analysis criteria and methodology.
- To rationalize resources allocated to pesticide monitoring, control and supervision.
- To strengthen participating institutions by training human resources.
- To strengthen links among institutions.

5.0 Actions / Activities

For the implementation of the National System for Monitoring POP and other priority pesticides in the Environment, food and population subject to exposure, the following stages have been defined:

Formulation (including execution of the pilot plan)	**Stages of Execution**	
	Stage I *Methodology design and validation* • **Phase A** Design of the methodology and institutional agreements • **Phase B** Implementation of pilot projects	
	Duration	**18 months**
Execution	**Stage II** *Nation-wide implementation of the monitoring plan* • **Phase A** Adjust and adapt the project on a national scale • **Phase B** Effective implementation	
	Duration	**18 months**

Stage I *Methodology design and validation*

Activities included in Stage I (formulation, including execution of the pilot project)

Phase A Methodology design and institutional agreements

- Convene key actors to integrate the inter-institutional work teams
- Agree on, define and distribute responsibilities
- Make survey of national information and identify gaps in information
- Establish environmental and health criteria to define the hotspots, critical spots or priority areas: populations at risk, consumer groups, types of foodstuffs inter alia.
- Define the various matrices on which pesticide studies will be made on POPs and other pesticides or their residues for the environment, human beings and food.
- Define and adjust time-tables and sampling protocols for residues in environmental, human and food matrixes.

Phase B Implementation of pilot projects

- Implement the pilot project on a reduced number of situations defined as priority (geographical regions, watersheds, human groups, types of foodstuffs, etc.)
- Evaluate the pilot project and incorporate changes to the methodology

Stage II *Implement the monitoring programme nation-wide*

Activities foreseen for nation-wide implementation of the pesticide monitoring system.

Phase A Adjust and adapt the project on a national scale

- Adjust and adapt the programme on a national scale.
- For the POP and other priority pesticide monitoring programme for workers subject to exposure, field tests will be made adjusting rity pesticides involving the different crops

using them and local conditions. This work will provide an input to address assessment of the maximum limits of residues established by national regulations .

Phase B Effective implementation

- Processing of information obtained
- Design of evaluation mechanisms
- Initial and continuous evaluation of the system
- Definition of lines of action to solve identified problems
- Implementation of such lines of action

6.0 Identified stakeholders

The stakeholders mentioned below are responsible for activities and participate in some way in the execution of the project

MVOTMA / DINAMA:	Ministry of Housing, Use of the Land and Environment / National Directorate for the Environment
MSP:	Ministry of Public Health
MGAP:	Ministry of Livestock, Agriculture and Fisheries
MTSS:	Ministry of Labour and Social Security
MIEM:	Ministry of Industry, Energy and Mines
CARU:	Administrative Commission for the Uruguay River
CARP:	Administrative Commission for the River Plate
INIA:	National Livestock and Agriculture Research Institute
UDELAR (RETEMA):	University of the Oriental Republic of Uruguay (Thematic Network on the Environment)
CIAT:	Centre for Toxicological Information and Advice
PIT-CNT:	Plenary Workers Trade Union Federation
CIU:	Uruguayan Chamber of Industry
ANEP:	National Public Education Board
PPR / MGAP:	Programme on Responsible Production / MGAP Municipal Governments
LATU:	Uruguayan Technological Laboratory
AUSE:	Uruguayan Agency for Food Safety
CAMM:	Model Market Administrative Committee
IMM:	Municipal Government of Montevideo

7.0 Time-table

The following table shows the periods and deadlines for each of the stages of the project.

Stages	Schedule
I. Methodology design and validation	18 months
I. A. Design of methodology and inter-institutional agreements	Months 1 to 8
I. B. Implementation of pilot projects	Months 9 to 18
II Implementation of the Nation-Wide Pesticide Monitoring System	18 months
II. A. Phase for adjustment and adaptation of the project on a national scale	Months 19 to 24
II. B. Phase for effective implantation	Months 25 to 36
Total	**36 months**

8.0 Budget

This table identifies the amounts requested for the various stages with their respective phases as foreseen.

Stages	Costs (USD)	Achievement indicators
I. Methodology Design and Validation	450.000	
I. A. Design of Methodology and inter-institutional agreements	100.000	Methodology designed and agreed on
I. B Implementation of pilot projects	350.000	Pilot projects implemented
II. Implementation of the Nation-Wide Pesticide Monitoring System	950.000	
II. A Phase for adjustment and adaptation of the project on a national scale	400.000	Methodology adjusted and adapted to national conditions
II. B. Effective implantation phase	550.000	Programmes effectively implemented. Assessment reports
Total	1.400.000	

9.0 Expected results

A better level of knowledge on the consequences of pesticides in our country leading to better and informed decision-making, benefiting strategic action lines.

The establishment of a pesticide monitoring, control and supervision methodology, including its validation, implementation and assessment in human, environmental and foodstuff matrices.

The integration of institutional efforts – which so far had operated in a scattered and uncoordinated way – in a single POP and other pesticide monitoring, control and supervision system.

IV Strengthening of institutional capacity to identify and soundly manage sites contaminated by Persistent Organic Pollutants

Implementing Agency: to be established later

Application of cooperation funds: GEF (PDFA/ MSP)

1.0 Identification of the problem, project relationship with national priorities, action plans and programmes

The development of the National Implementation Plan for the Stockholm Convention in Uruguay (NIP) has shown the country's need to fully comply with section 1 of Article 6 of the Stockholm Convention that engages the Parties to identify sites contaminated by POPs and to proceed in an environmentally sound manner if remediation of those sites is undertaken. Gaps have been identified in legal, administrative and financial instruments hindering the management of these sites, preventing the development of a long-term plan and making it difficult to assign responsibilities and roles in management by public institutions, companies and owners of contaminated sites. The need to build up institutional capacity has been identified, mainly through training and resource allocation to address site assessment, establish intervention priorities and promote characterization and remediation.

Through the inventory of sites potentially contaminated by POPs and other persistent toxic substances, sites were identified that could potentially show high concentrations of POPs in the soil and/or groundwater, involving potentially significant risks to human health and the environment. These sites are mainly linked to the formulation and storage of POP pesticides, manufacture and storage of electric transformers and condensers and to places where the waste from these activities has been treated and disposed of. Other sites are related to the treatment of wood with Pentachlorofenol, ovens to incinerate domestic, medical and industrial waste, crematoria, pulp mills and industrial waste dumps. In fact, during 2006, under the guidance of NIP project technologists, a chemical industry carried out remediation of its pesticide formulation plant (including Aldrin, Dieldrin and DDT) that operated between 1960 and 1990, one of the potentially contaminated sites identified in the inventory.

Changes taking place in the national productive sector over the past decades have led to emptying or sub-use of areas formerly occupied by industries. This, added to the considerable pressure of squatting on land by low-income sectors of the population, has increased the hazard of a large number of potentially contaminated sites being used for residential or recreational purposes with no prior characterization or eventual remediation. Uruguay has ratified the Stockholm Convention and has the necessary legal bases for the protection and rehabilitation of soil quality, mainly through the General Law for Environmental Protection (Law Nº 17.283). This law sets out the principles for development, adoption and implementation of specific regulations, in this case, for contaminated site management. Regarding the prevention of contamination, presently existing instruments can be adapted and improved, for example those referring to environmental impact assessment of new enterprises and emission permits for potentially soil-contaminating activities.

The Ministry of Housing, Use of the Land and Environment, through the National Directorate for the Environment, is the body responsible for making environmental protection policies and plans. Part of its tasks is to design and apply measures for environmentally sound management of contaminated sites.

2.0 Conceptual definition of the project

The present project is framed in the action lines proposed by NIP referring to the need to build up institutional capacity to improve contaminated site management in Uruguay. This project seeks to eliminate the main identified obstacles and encourage the appropriate institutions to design a specific policy on the matter.

For this purpose, it proposes developing specific regulations establishing responsibilities of physical and legal persons related to the use and ownership of the sites, and the role of public institutions in their management. Levels of reference and intervention shall be established for soils and groundwater together with technical criteria assessment, characterization and remediation. It shall include technical and administrative instruments to prevent generation of contaminated sites. It shall also define mechanisms for information generation, exchange and public consultation.

3.0 Objectives

General objective

To develop and build-up institutional capacity for the identification and sound environmental management of sites contaminated by POPs and other persistent toxic substances.

Specific objectives

- To develop and adopt specific regulations for contaminated site management.
- To strengthen institutional capacity for action through the training of national and local government technicians, the development and strengthening of their analytical capacity and adoption of methodologies leading to the comprehensive assessment of environmental and human health problems.
- To generate fora and mechanisms for the permanent exchange and updating of information on potentially contaminated sites.
- To promote awareness on the part of key stakeholders related to contaminated site generation and management.

4.0 Activities / Actions

- To adopt procedure for Environmental and Human Health Risk Assessment: Identification and Characterization of Exposure Sources, Routes and Ways and of the Receptors.
- To establish indicators of human exposure to POPs and other persistent toxic substances and to define procedure for their application according to risk and vulnerability criteria.
- Preliminary Assessment and design of management plans for priority contaminated sites: formulation and storage of POP pesticides; storage and manufacture of electric transformers and condensers and other sites potentially contaminated by POPs.
- Design of specific regulations.
- Design of administrative and financial instruments to encourage characterization and remediation of "orphan" sites.

5.0 Expected Results / Benefits from the project

The main results expected following implementation of the project are:

- The prevention of unsuitable use of sites contaminated by POPs and other persistent toxic substances.
- The minimization and mitigation of hazards to the environment and human health through the preparation and implementation of management plans.

6.0 Identified actors

- MVOTMA as the responsible body in the environmental area.
- Ministry of Public Health, in its role to prevent human health hazards.
- Municipal Governments as administrators of the local territory.
- Companies carrying out or who have carried out activities which are potentially soil-contaminating.
- Owners of potentially contaminated sites.

V Promotion of Best Available Technological and Best Environmental Practices

Proposed implementing agency: to be established later

GEF application funds / Loan component, full-size project

General objective

To build-up national capacity for the promotion and effective application of Best Available Technologies and best environmental practices in key identified sectors in the release of unintentional POPs through the design and application of tools to encourage and strengthen the control of these activities.

The project basically involves four components, namely:

- 1 Component to build-up the capacity of national and departmental bodies responsible for environmental monitoring of activities potentially releasing POPs unintentionally
- 1 Component to strengthen national capacity for the development of a national policy for the Promotion of Cleaner and Eco-efficient Production Technologies and a component to sit at the National Board for Cleaner Production, a public-private forum identified as ideal for the promotion of Cleaner Production activities.
- 1 Component for the development of mechanisms and tools for the promotion of the application of Best Available Technologies in identified key productive sectors. In particular, the need has been identified to develop incentives for the application of BATs and facilitate access to credit for technological retrofitting. In order to cover this last aspect, the need to generate specific credit has been identified.
- 1 Training, Awareness and Education Component, aimed at establishing a critical mass in training and technology processes to minimize dioxins and furans and to facilitate company access to credits.

Request for preparation funds: Not budgeted

VI Environmentally sound management of solid waste

Proposed implementation agency: to be established later

GEF application funds / Loan component, full-size project

General objective

To minimize the generation of unintentional POP emissions from uncontrolled burning of solid waste through the promotion of practices for the minimization, environmentally sound evaluation and improvement of treatment and final disposal management.

The project is identified as basically involving five components, namely:

- 1 Component to build-up MVOTMA DINAMA and Municipal Government capacity to control industrial, agro-industrial and service solid waste generation and management.
- 1 Component for basic studies to design regional solutions for urban solid waste management with emphasis on the implementation of improvements in final disposal sites and the avoidance of open air waste burning.
- 1 Component related to facilitating the implantation of basic facilities for environmentally sound management of solid urban waste consistent with the regional solutions designed.
- 1 Component for the promotion of practices to minimize generation and to assess waste through the implementation of demonstrative pilot projects
- 1 Component for Training, Sensitization and Awareness aimed at promoting sound waste management and avoid open air burning practices.

Preparation funds: not budgeted

Annex 1

DECREE NO. 375/005 Ban on chlorinated substances in conformity with the Stockholm Convention

File 2005/01774

MINISTRY OF HOUSING, USE OF LAND AND ENVIRONMENT

MINISTRY OF FOREIGN AFFAIRS

MINISTRY OF ECONOMY AND FINANCE

MINISTRY OF INDUSTRY, ENERGY AND MINES

MINISTRY OF LABOUR AND SOCIAL SECURITY

MINISTRY OF PUBLIC HEALTH

MINISTRY OF LIVESTOCK, AGRICULTURE AND FISHERIES

REFERENCE 34/2005

Montevideo, 03 October 2005

CONSIDERING: The Stockholm Convention on Persistent Organic Pollutants, adopted by Law No. 17.732 of 31 December 2003;

FINDING: I) that the Stockholm Convention refers to certain chemical substances that are presently recognized as persistent and that can bio-accumulate in organisms and may cause negative effects on the environment, including human health;

II) that among these products the Convention includes a series of chemical substances, some of which may be used as pesticides and for which measures have been established to eliminate their production and use, in addition to the sound disposal of unwanted stockpiles that may exist or that are obsolete at the time of the ban;

III) that our country has been developing, through the Ministry of Housing, Use of Land and Environment, with the participation of the Ministries of Public Health and Livestock, Agriculture and Fisheries in addition to other bodies and social stakeholders, a National Plan for the Implementation of the Stockholm Convention with the support of the United Nations Environmental Programme;

CONSIDERING: I) That it is advisable to adopt measures that will ensure prohibition of introduction, production or use of such substances in the territory of the Republic, in application of the principle of national environmental protection (article 6 of Law No. 17.283 of 28 November 2000);

II) That some of these substances have been subject to previous measures restricting them or banning them, adopted by the Ministry of Public Health or by the Ministry of Animal Husbandry, Agriculture and Fisheries, as is the case of organichloride insecticides and dodecachlordecone (Mirex);

III) That the measures to be adopted will not have a negative impact on trade or on national production, however a three months period will have to be established to report stockpiles that may be covered by this ban;

NOTING the provisions of Law 16.112 of 30 May 1990, Law No. 9,202 of 12 January 1934, article 137 of Law 13.640 of 26 December 1967 and article 20 of Law No. 17.283 of 28 November 2000:

THE PRESIDENT OF THE REPUBLIC

D E C R E E S

Article 1 (Ban): The introduction, production and use of the following chemical substances and preparations or of formulas that may contain them are banned under any form or any system in areas subject to national jurisdiction:

Chemical substance	**Chemical Abstracts Service Record No**
Aldrin	309-00-2

Chlordane	57-74-9
Dieldrin	60-57-1
Endrin	72-20-8
Heptachlor	76-44-8
Hexachlorobenzene	118-74-1
Mirex (Dodecachlordecone)	2385-85-5
Toxaphene,	8001-35-2
DDT (1,1,1-trichlor 22-bis (Chlorophenolic) ethane)	50-29-3

Article 2 (Scope). The ban established in the previous article covers all forms of use, including agricultural, industrial, domestic, sanitary and any other possible uses of such substances. The only exception is the import of quantities of a chemical for research purposes on laboratory scale or as a reference pattern.

Article 3 (Declaration). All holders under any capacity of the chemical substances included in article 1 or their preparations or formulations at the date of the publication of the present decree, shall declare them to the Ministry of Housing, Use of the Land and Environment or to the Ministry of Livestock, Agriculture and Fisheries, within the 3 (three) months immediately following such publication

For this purpose, these State Secretariats shall implement the method and conditions under which the declarations shall be submitted and received. They will be considered as affidavits.

Article 4 (Controller) The respective Ministries, within their sphere of competence, shall monitor compliance with the present

decree. This shall be coordinated by the Ministry of Housing, Use of the Land and Environment, through the National Directorate for the Environment.

Article 5 (Punitive measures). Those breaching the provisions of the present decree shall be penalized in conformity with the provisions of Article 6 of Law No. 16.112 of 30 May 1990 and article 15 of Law No. 17.283 of 28 November 2000, in the following way:

a) They shall be fined between 100 UR (one hundred readjustable units) and 5000 UR (five thousand readjustable units). This amount shall be graduated according to the seriousness of the breach.

b) When involving breaches considered serious, in accumulation with the corresponding fine, the objects used for unlawful activities such as vehicles, vessels and instruments may be confiscated, without any regard to the owner of the property.

c) When involving breaches considered serious or by repeated or continuous offenders, in accumulation with the former punitive measures, suspension of up to one hundred and eighty days of registrations, authorizations or permits to carry out the respective activity shall be stipulated.

Article 6 (Other measures). The stipulations of the above article are applicable without detriment to the adoption of the complementary measures stipulated in article 14 of Law No. 17,283 of 28 December 1990 in addition to the faculties conferred by article 453 of Law No. 16,170 of 28 December 1990 and by article 4 of Law No. 16,446 of 19 January 1994.

MINISTERIO DE VIVIENDA ORDENAMIENTO TERRITORIAL Y MEDIO AMBIENTE

Article 7 (Period of effectiveness). The present decree shall enter into force as from the date of its publication and its stipulations shall enter into force immediately, except for the ban on the use of stocks of such substances that are to be found in the national territory on that date and that have previously been declared in the way stipulated in article 3.

In these cases, the Ministry of Housing, Use of the Land and Environment and, if it corresponds, the Ministry of Livestock, Agriculture and Fisheries or the Ministry of Public Health, shall determine the form of use or final disposal of such stocks, which shall have to be made effective within a delay of no more than one year as from publication of the present decree.

Article 8. To be communicated, published, etc.

Signatures

Dr. Tabaré Vázquez

President of the Republic

Annex 2

Methodology for the updating of the Inventory of Unintentional Emissions

METHODOLOGY FOR THE UPDATING OF THE INVENTORY OF UNINTENTIONAL EMISSIONS

CONTENTS

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2.1 Uncertainty of data

The values of activities gathered in the updating of the emissions inventory have different degrees of uncertainty. A way of assessing them is to categorize them according to three levels related to each other, indicated here below:

- data affected by low degree of error.
- data affected by medium degree of error
- data affected by high degree of error

The following table shows the various activities potentially releasing dioxin and furan carried out in the country, their percentage of inputs vis-à-vis total emissions in 2003, the relative qualitative degree of error shown by the activity data and a brief summary on the pertinence of actions aimed at improving the data.

1 Percentage of input to the country's total emissions.

Table 2.1.1 – Percentage of input of the activities, uncertainty of activity data.

Activity	%[1]	uncertainty	Comment	Data improvement
Waste incineration	53	High	Good information is available on the amount of waste generated in the Metropolitan area, however, only the fraction burnt by street scavengers can be considered as a good estimate as the values for the rest of the waste burnt in generators or in accidental fires in refuse dumps are assumed and may contain a considerable degree of error.	Improvement of this data is difficult. In this case it would be relevant to focus efforts on lessening its intensity
Dumping in landfills and waste dumps	11	Low	-	-
Open air burning of agricultural waste	8	High	This is an important input to the country's emissions. It represented 9, 18 and 8 % of total emissions for the years 2000, 2002 and 2003 respectively.	There is no record of the quantity of waste generated or of its destination. Action should not be aimed at improving data on the activity. Action should be aimed at improving agricultural waste management.
Pulp and paper production	5	Low	-	-
Aluminium production	4	Low	-	-
Biomass household heating	3	High	In total emissions this is insignificant. Within the category of energy production, it is the greatest input (2003: 66 % of emissions in the air and 80 % of waste emissions). Burning of firewood has increased given the rise in the cost of fossil fuels and increased area of forested areas. In the future it may represent a significant input. The National Energy Balance takes the volume of firewood consumption from the National Direction for Statistics (DNE) that does not have updated data beyond 1988.	Improve data on the activity through updating the survey made by the National Statistics Institute (INE).
Accidental Fires in Households and Factories	2	High	The error associated with these processes is due to the lack of information on the quantity of material burnt during each event. There is a record of the affected structures but the amount of material burnt has to be guessed as there are no available references or the practical possibility of improving estimates.	Action should not be aimed at improving data on this activity.
Incineration of Hospital Waste	2	Low	-	-
Fuel oil engines	2	Low	-	-
Biomass plants	1	Low	-	-
Open air burning of cables	1	High	This may be relevant within category 2 (production of metals) but not within the country's total emissions. The whole activity is undertaken informally mainly following theft of cables that is difficult to estimate. The practice permitted is that of cable stripping. It is a risk for the population undertaking the activity, mainly in shanty towns (large child population and sanitary deficiencies).	Action should not be aimed at improving data on the activity. Efforts should be aimed at lessening the intensity of the practice.
Forest fires	1	High	Input has not been significant in the country's total emissions and is very variable. The National Fire Brigade (DNB) collects information on the area and type of vegetation affected and data show considerable error. Furthermore, the amount of biomass burnt has to be guessed in order to estimate emissions and this aspect also shows considerable error.	Support to DNB to obtain better estimates of the affected areas.

Table 2.1.1 – Percentage of input of the activities, uncertainty of activity data.

Activity	%[1]	uncertainty	Comment	Data improvement
Waste water and its treatment	1	Medium	Information is not fully available nor does it have the necessary degree of discrimination.	Improve the quality of necessary information in coordination with the bodies responsible for management and systematize it.
4-Stroke engines	1	Low	-	-
Copper production	1	Low	-	-
Lime production	1	Low	-	-
Clinker production	1	Low	-	-
Open water dumping	0,4	Medium	-	-
Composting	0,4	Medium	This is not a significant input, however, it is increasing. Most of the activity is informal.	Set up a system to register compost producing plants and establish standards and quality follow-up.
Crematoria	0,3	Low	-	-
Iron and steel production	0,2	Low	-	-
Fires in vehicles	0,2	Low	-	-
Diesel engines	0,1	Low	-	-
Fossil fuel power plants	0,1	Low	-	-
Asphalt mixing	0,1	Low	-	-
Textile production	0,1	Low	-	-
2-Stroke engines	0,1	Low	-	-
Domestic heating (fossil fuel)	0,1	Low	-	-
Brick production	0,02	High	The impact is low. However on a local scale it represents a hazard. It is mostly an informal activity that is hard to estimate.	Actions should not be aimed at improving data. The use of waste as fuel potentially generating POPs should be minimized.
Ceramics production	0,02	Low	-	-
Charcoal production	0,01	Medium	Part of the activity is informal	A record of the activity will make it possible to obtain better data on the volume and conditions of production.
Zinc production	0,004	Low	-	-
Production of brass and tin	0,003	Low	-	-
Combustion of animal carcasses	0,002	High	The volume of material incinerated in ovens shows little error however there are some entities that practice open air burning and the size of this activity is unknown.	The appropriate disposal of animal carcasses should be promoted, discouraging open air burning.
Cigarette consumption	0,001	Low	-	-
Lead production	0,001	High	This is partly an informal activity that may have a high, non-assessed relative weight. It is a risk for the population carrying out the activity informally, mainly in shanty-towns.	Regulate and implement a system for authorization of this activity.
Dry-cleaning	0,0002	High	Impact on a country level is not relevant but it is interesting given that waste generated is not managed nor are there records of the amount of waste generated.	The level of the activity and volume of waste generated and its management should be recorded.

2.2 Updating of the inventory

Over the past few years the various sectors of production in Uruguay have not shown variations in the volume of activity reflected in significant changes in emission levels. However, the country's industrial development, mainly comprising small and medium sized companies leads to considerable variations in the sector's emissions when the installation of large sized plants is foreseen.

For this reason, the updating of the national emission inventory will be an important tool when measures are implemented on a country level to reduce emissions or when the installation of industries operating on a large scale are considered. Updating will make it possible to have an estimate of the effectiveness of measures implemented and a map of relative contributions as an input for the implementation of new measures.

When no relevant aspects are found to justify updating for the total of the country's activities, this may consist of incorporating only additional emissions for the installation of new enterprises or the incorporation of changes in the Standardized Toolkit.

2.2.1 Base year and trends

In order to establish the country's level of emissions the inventory of dioxin and furan emissions must be updated periodically and compared with the series of previous inventories adapted to:

- Changes indicated in the Toolkit, both regarding categories considered and regarding factors of emission.
- Changes in the level of available information, for example incorporation of activities in the emissions of previous inventories for which information is available in the update but that had not previously been incorporated due to lack of data.

The base year for our country corresponds to the year 2000 when the first inventory of dioxin and furan emissions was made.

2.2.2 Incorporation of distinctive emission factors

The implementation of self-control by the industrial sector is foreseen. This will make it possible - through the results of monitoring plans - to establish distinctive emission factors for dioxins and furans in those sectors of activity having established periodic measurements.

Another relevant aspect is the need to obtain dioxin and furan levels at certain points for some key forms of release in the country such as the waste from pulp production and from the incineration of hospital solid waste which, together with the above mentioned monitoring for the industrial sector, will lead to improving estimates incorporating distinctive factors of emission in the national emissions inventory.

The objective of the proposed measurements is not only to obtain emission factors but to assess the effectiveness of actions to be implemented, the need for additional action to reduce emissions and appropriate weighting of some waste generated in considerable volume and/or with relatively high emission factors according to bibliographic data.

2.2.3 Frequency of updating and forecasts

The Convention Secretariat has established that the parties should update inventories of dioxin and furan emissions regularly. Appropriate frequency is that which makes it possible to identify the results of implementing measures aimed at reducing emissions. Relative steadiness of inventory results and the industrial horizon of the country make it unnecessary to carry out a complete updating of the inventory in the short term. The only potentially releasing sector where significant changes in production may be expected corresponds to the production of pulp

and paper, due to the technological recycling of an already established mill and the installation of two large mills producing bleached Kraft pulp. The estimates of variations in the sector have already been made on the basis of emission factors provided by the Standardized Toolkit. In this respect it is suggested that the next updating of the inventory be made in the year 2009, once:

- The regulations on solid wastes become operational;
- The sensitization and awareness activities aimed at promoting sound practices in waste management have been implemented; and
- Agreements on clean production have been achieved with priority industrial sectors;
- The plan for monitoring emissions from the industrial sector is in process of implementation.

Following this point, it is proposed that updating be undertaken every five years.

2.3 Methodology

Under this item, suggested methodology is presented for updating the national inventory of dioxin and furan emissions. Some aspects were included as a result of lessons learnt once the inventory was published. The suggested methodology, together with actions proposed in the National Implementation Plan, is aimed at:

- Reducing time and effort made in updating the inventory, improving efficiency in resource use;
- Obtaining better estimates, both from the incorporation of activities/ enterprises that have not been considered and from improvement of already identified data.
- Facilitating ease of comparison of the results of different year inventories, reducing the effort of recalculation of emissions obtained from inventories which have been prepared using different methodologies.
- Making updating of the inventory a more participative process in which those involved provide comments thus enriching the quality of the results and actions to be taken on their basis.

2.3.1 Estimation of emissions

Estimation of the country's levels of emission is based on calculations from data on **activity rates and default emission factors** recognized internationally. For this purpose the methodology suggested by the Standardized Toolkit for the Identification and Quantification of Dioxin and Furan Releases (Toolkit) prepared by the United Nations Environmental Programme – Chemicals has been used.

The Toolkit uses a five-step standardized procedure to obtain inventories of coherent and comparable sources and emissions. The default emission factors supplied by the Toolkit are expressed in equivalent toxicity units and depend on the activity and the technology used to carry it out. For countries lacking their own measurements, these represent the best estimates as they are based on data for measurements for emission sources using similar technologies, operational process and practice features. They are based on information available in the literature and are revised as new data appear. The rates of activity are annual values of production or consumption as applicable. In some cases these values will be estimated and in others will be the value provided by each sector. The product of the annual rate of activity and the corresponding emission factor makes it possible to estimate annual emissions for each potentially releasing sector.

The methodology used by the Toolkit makes a categorization of activities potentially generating dioxin and furan emissions and their release into five compartments or media: air, water, land, waste and products:

Table 2.3.1 – General screening matrix

Nº	Main source categories	Possible release routes				
		AIR	WATER	LAND	PRODUCT	WASTE
1	Waste incineration	X				X
2	Ferrous and non-ferrous metal production	X				X
3	Power generation and heating	X		X		X
4	Production of mineral products	X				X
5	Transport	X				
6	Uncontrolled combustion processes	X	X	X		X
7	Production and use of chemicals and consumer goods	X	X		X	X
8	Miscellaneous	X	X	X	X	X
9	Waste management and disposal	X	X	X	X[2]	X
10	Identification of potential hotspots	Probably registration only to be followed by site-specific evaluation				

Each category is divided into more specific subcategories. The following matrices show the compartments into which potential dioxin and furan emissions may be released according to information presented in the Standardized Toolkit.

Note: The upper case "X" indicates the predominant release route for each category although some of these releases are not well characterized. A lower case "x" indicates additional and widely identified release routes. An "(x)" indicates that release into the indicated media occurs occasionally.

Table 2.3.2 – Screening matrix Category 1

Nº		Subcategory	Potential release routes				
			Air	Water	Land	Product	Waste
1		WASTE INCINERATION	X				X
	a	Municipal solid waste incineration	X	x			x
	b	Hazardous waste incineration	X	x			x
	c	Medical waste incineration	X	x			x
	d	Medical waste incineration	X				x
	e	Sewage-sludge incineration	X	x			x
	f	Waste wood and waste biomass incineration	X				x
	g	Combustion of animal carcasses	X				x

Table 2.3.3 – Screening matrix Category 2

Nº		Subcategory	Potential release routes				
			Air	Water	Land	Product	Waste
2		**FERROUS AND NON-FERROUS METAL PRODUCTION**	X				X
	a	Iron ore sintering	X				x
	b	Coke production	X	x	x	x	x
	c	Iron and steel production and foundries	X				x
	d	Copper production	X				x
	e	Aluminium production	X				x
	f	Lead production	X				x
	g	Zinc production	X				x
	h	Brass and tin production	X				x
	i	Magnesium production	x	x			x
	j	Other non-ferrous metal production	x	x			x
	k	Shredders	X				x
	l	Thermal wire reclamation	X	(x)			x

2 The Toolkit does not note this release route, however category 9 considers the product compost as a possible release route for waste treatment.

Table 2.3.4 – Screening matrix Category 3

Nº		Subcategory	Potential release routes				
			Air	Water	Land	Product	Waste
3		**POWER GENERATION AND HEATING**	x		(x)		X
	a	Fossil fuel power plants	x				x
	b	Biomass power plants	x				x
	c	Landfill, biogas combustion	x				x
	d	Household heating and cooking (biomass)	x		(x)		x
	e	Domestic heating and cooking (fossil fuels)	x		(x)		x

Table 2.3.5 – Screening matrix Category 4

Nº		Subcategory	Potential release routes				
			Air	Water	Land	Product	Waste
4		**PRODUCTION OF MINERAL PRODUCTS**	X				X
	a	Cement production	X				x
	b	Lime production	X				x
	c	Brick production	X				x
	d	Glass production	X				x
	e	Ceramics production	X				x
		Asphalt mixing	X			x	x

Table 2.3.6 – Screening matrix Category 5

Nº		Subcategory	Potential release routes				
			Air	Water	Land	Product	Waste
5		**TRANSPORT**	X				
	a	4-Stroke engines	X				
	b	2-Stroke engines	X				
	c	Diesel engines	X				(x)
	d	Heavy oil fired engines	X				(x)

Table 2.3.7 – Screening matrix Category 6

Nº		Subcategoría	Potential release routes				
			Air	Water	Land	Product	Waste
6		**UNCONTROLLED COMBUSTION PROCESSES**	X				X
	a	(Clean) Biomass burning	X	(x)	X		(x)
	b	Waste burning and accidental fires	X	(x)	X		(X)

Table 2.3.8 – Screening matrix Category 7

Nº		Subcategory	Potential release routes				
			Air	Water	Land	Product	Waste
7		**PRODUCTION AND USE OF CHEMICALS AND CONSUMER GOODS**	X	X		X	X
	a	Pulp and paper mills	x	X		x	X
	b	Chemical industry	x	x	(x)	X	X
	c	Petroleum industry	x				x
	c	Textile plants		x		x	
	d	Leather plants		x		x	

Table 2.3.9 – Screening matrix Category 8

Nº		Subcategory	Potential release routes				
			Air	Water	Land	Product	Waste
8		**MISCELLANEOUS**	X	X	X	X	X
	a	Drying of biomass	x			x	
	b	Crematoria	x				X
	c	Smoke houses	x			X	X
	c	Dry cleaning		x		x	x
	d	Tobacco smoking	x				

Table 2.3.10 – Screening matrix Category 9

Nº		Subcategory	Potential release routes				
			Air	Water	Land		Waste
9		**DISPOSAL**		X	X		X
	a	Landfills and waste dumps		x			
	b	Sewage and sewage treatment	(x)	x	x	x	x
	c	Open water dumping		x			
	c	Composting			x	x	
	d	Waste oil disposal (non-thermal)	x	x	x	x	x

Table 2.3.11 – Screening matrix Category 10

Nº		Subcategory	Potential release routes				
			Air	Water	Land	Product	Waste
10		**IDENTIFICATION OF POTENTIAL HOT-SPOTS**	Probable record only when specific evaluation takes place on the site				
	a	Production sites of chlorinated organics			X		
	b	Production sites of chlorine			X		
	c	Formulation sites of chlorinated phenols			X		
	d	Application sites of chlorinated phenols	x	X	x	x	
	e	Timber manufacture and treatment sites		X	X	x	x
	f	PCB-filled transformers and capacitors				x	x
	g	Dumps of wastes/residues from categories 1-9	x	X	X		x
	h	Sites of relevant accidents		X	x		x
	i	Dredging of sediments					x
	j	Kaolinitic or ball clay sites			x		

The five steps involved in the application of the Toolkit to prepare the inventory are:

1. Apply screening matrix to identify main source categories
2. Check subcategories to identify existing activities and sources in the country
3. Gather detailed information on the processes
4. Quantify identified sources with default/ measured emission factors assumed for our country's technologies.
5. Apply nation-wide to establish full inventory and report results using guidance given in the standard format.

The information to be requested from each sector of activity is determined by the methodology described for the preparation of the inventory.

The results are tabulated according to the Toolkit recommended format. Annual releases for each activity to each compartment are expressed in equivalent grams of toxicity per year for the year to be inventoried.

2.3.2 Identified stakeholders and information gathering

The key stakeholders have been identified at the time of gathering information for each potentially releasing activity. The procedure to be followed to gather the necessary date is indicated here below.

2.3.2.1 Identification of release sources

The National Directorate for the Environment (DINAMA) and previous emission inventories are the sources of information on activities taking place in the country.

2.3.2.2 Information gathering

On requesting any type of information it is important to indicate what use it will be given and, prior to sending the note, to establish a personal interview or a telephone conversation.

The following table shows the way of obtaining necessary data for the emission inventory:

Table 2.3.12 Source of information by activity

Sector	Activity	Information gathered
Industrial	Metallurgy	DINAMA: Declaration Form
	Cement production	DINAMA: Declaration Form
	Lime production	DINAMA: Declaration Form
	Ceramics production	DINAMA: Declaration Form
	Asphalt mixing	DINAMA: Declaration Form
	Brick production (*)	DINAMA: Declaration Form
	Pulp and paper mills	DINAMA: Declaration Form
	Textile production	Sector companies
	Leather production	Sector companies
	Oil refinery	ANCAP
Waste and waste water management	Incineration of animal carcasses	DINAMA: Declaration Form
	Medical waste incineration	DINAMA: Declaration Form
	Composting(*)	DINAMA: Declaration Form
	Waste dumps	Intendencias Municipales
	Waste water	I.M.M. – OSE – concessionaires
	Waste oil	DINAMA
Power generation and heating	Various	National Energy Balance (BEN)
Transport	2 and 4 Stroke engines	ANCAP – UruNet – importers of lubricant oils.
	Diesel engines	National Energy Balance (BEN) – ANCAP
	Fuel oil engines	National Energy Balance (BEN) – ANCAP
Uncontrolled combustion processes	Thermal wire reclamation	ANTEL - UTE
	Forest and grassland fires	DNB
	Structure and vehicle fires	DNB
	Burning of agricultural waste	Agriculture sector technicians – various agriculture sector groups
	Charcoal production	BEN
	Burning of domestic waste	Burning in final disposal sites: declaration form For remaining waste burnt in open air: assessment to be made on a national level
Various	Crematoria	DINAMA: Declaration Form
	Dry cleaning (*)	DINAMA: Declaration Form
	Tobacco consumption	Consumer survey
	Dredging of sediments	National Port Authority - National Directorate for Hydrography
	Application of chlorinated phenols	UruNet - MGAP
	Wood treatment (*)	DINAMA: Declaration Form

Observations:

1) Declaration of activity and processes to DINAMA using a form is a proposal to be implemented from the year 2007, with a frequency to be established later. Item 2.3.3. gives more details.
2) (*):These are activities that have not yet been exhaustively surveyed. Information is not available on the number of enterprises or on their activities. Implementation of registration with DINAMA and submission of a data declaration form may take place in the long term.

In these cases and in those where data declaration has not yet covered all the companies in the sector, estimates will have to be made on the

basis of previous inventories, consultation with the sectors and qualified sources of information.

2.3.3 Information to be gathered for each activity – forms

Regarding data gathering itself, two key aspects have been identified:

- Difficulty and time taken in obtaining data.
- Uncertainty of data for some activities.

Beyond the data on activities that need improving regarding uncertainty, there is a series of activities for which information-gathering is complicated and time-consuming when up-dating the emissions inventory.

For this reason, for some sectors of activity it is proposed that information be submitted regularly in forms filled out by the person responsible for the activity.

The forms formats set out in the following item are based on the necessary information according to the February 2005 updating of the Toolkit. Versions in force will have to be revised because of possible changes to be incorporated in the forms. It should be noted that additionally, information requested in the form must be revised to consider the needs of other DINAMA divisions responsible for preparing inventories of emissions of other pollutants. The complexity and volume of information requested should also be discussed and assessed as in many cases they may affect its quality. For some activities, the implementation of handing out the forms may be time-consuming given some of the characteristics they present, among others, their degree of informality, low production volumes, activities that have not been addressed so far by DINAMA, hindering prompt identification of the enterprises.

Within this group of activities are the following:

- Brick production is predominantly an informal and artisan activity. There is no registry of brick-makers. A survey of the sector needs to be made. DINAMA has made a diagnosis in a pilot zone which showed the need to establish guidelines regarding practices in this sector.
- In the case of companies treating wood with chemical preservatives, DINAMA-GTZ have made an exhaustive survey, at this time only covering those impregnating with CCA. Following stages require the availability of a registry of companies treating wood, identifying production practices and products used.
- Other activities predominantly carried out on an informal level: composting and charcoal production. A registry of enterprises and quality criteria should be established. Dry-cleaning is an activity where it is difficult to gain knowledge of practices regarding substance and waste management. The sector needs to be addressed in order to implement communication on the volume of waste generated and its management by the person responsible for the company.

For the above mentioned activities, obtaining a primary list of enterprises will require a coordinated task with Municipal Governments and other local stake-holders.

2.3.4 Forms

Incineration of medical waste, animal carcasses and cremation

Declaration form.

Name of the company					
Address					
Contact	Name		Position		
	Telephone		Fax		
	e-mail				
Type of waste incinerated			Number of ovens in operation		
Oven 1	Type of oven				
	Type of operation		Batch		
			Semi-continuous		
			Continuous		
	Nominal capacity				
	Operation		Tons / year		
			Days / week		
			Days / year		
	Oven temperature		Main chamber		
			Second chamber / post-burner		
	Gas treatment system		Electrostatic precipitator		
			Cyclone		
			Hose filter		
			Humid purifier		
			Dry purifier		
			Lime injection		
			Alkalis / NaOH injection		
			Activated coal / coke injection		
			Activated carbon filter		
			Catalytic converter / SCR system		
			Forced or induced ventilator draught		
			Other (specify)		
			None		
	Heat recovery system		Yes		No
	Gas temperature (ºC)		On entry to the treatment system		
			On exit of the treatment system		
	Output gas flow (m3/h, dry base)				
Wastes	Deposited ash generation (bed) kg/a		destination		
	Airborne ash generation kg/a		destination		
	Waste water generation kg/a a		destination		
	Sludge generation kg/a		destination		
	Other (specify) kg/a		destination		
Oven n	same as previous				

SCR: selective catalytic reduction / reaction

Production of ferrous and non-ferrous metals

Declaration form

Name of the company						
Address						
Contact	Name		Position			
	Telephone		Fax			
	e-mail					
Type of plant	Sintering					
	Coke production					
	Iron	primary		secondary		
	Steel	primary		secondary		
	Copper	primary		secondary		
	Aluminium	primary		secondary		
	Lead	primary		secondary		
	Zinc	primary		secondary		
	Tin / brass primary	primary		secondary		
	Magnesium	primary		secondary		
	Other non-ferrous metals	primary		secondary		
	Others	primary		secondary		
Number of furnaces in operation						
Furnace 1	Furnace 1	Blast furnace				
		Induction furnace				
		Electric arc furnace				
		Copwer				
		Rotary drum				
		Reverberatory				
		Other (specify)				
	Type of furnaces	Batch				
		Semi-continuous				
		Continuous				
	Nominal capacity					
	Operation	Tons / year				
		Days / week				
		Days / year				
	Furnace temperature	Main furnace (ºC)				
		Secondary chamber / post-burner (ºC)				
	Primary fuel	type		Annual consumption (t/year)		
	Secondary fuel / alternative 1	type		Annual consumption (t/year)		
	Secondary fuel / alternative 2	type		Annual consumption (t/year)		
	Gas treatment system	Electrostatic precipitator				
		Cyclone				
		Hose filter				
		Humid purifier				
		Dry purifier				
		Lime injection				
		Alkalis / NaOH injection				
		Activated coal / coke injection				
		Activated carbon filter				
		Catalytic converter / SCR system				
		Forced or induced ventilator draught				
		Other (specify)				
		None				
	Heat recovery system	Yes		No		
	Gas temperature (ºC)	On entry to the treatment system				
		On exit from the treatment system				
	Output gas flow (m3/h, dry base)					
Furnace n	Idem horno anterior					
Wastes	Type		Annual Volume (kg/yr)		destination	
	Type		Annual Volume (kg/yr)		destination	
	Type		Annual Volume (kg/yr)		destination	

Power and heating generation

The necessary information is available in the National Energy Balance prepared by the Energy and Nuclear Technology Directorate of the Ministry of Industry, Energy and Mines.

Production of mineral products

Declaration form

Name of the company						
Address						
Contact	Name			Position		
	Telephone					
	Fax			e-mail		
Type of plant	Cement					
	Lime					
	Brick					
	Glass					
	Ceramics					
	Asphalt mixing					
Number of furnaces in operation						
Furnace 1	Type of furnace	Rotary drum				
		Tank / vertical				
		Tunnel				
		Other (specify)				
	Material used to fuel (type and quantity (t/year))					
	Primary fuel (type and quantity (t/a))					
	Secondary / alternative fuel (type and quantity (t/year))					
	Type of process	Dry		Humid		
	Type of operation	Batch				
		Semi-continuous				
		Continuous				
	Nominal capacity					
	Operation	Tons / year				
		Days / week				
		Days / year				
	Furnace temperature	Main chamber				
		Secondary chamber / Post-burner				
	Gas treatment system	Electrostatic precipitator				
		Cyclone				
		Hose filter				
		Humid purifier				
		Dry purifier				
		Lime injection				
		Alcalys / NaOH injection				
		Activated coal / coke injection				
		Activated carbon filter				
		Catalytic converter / SCR system				
		Forced or induced ventilator draught				
		Other (specify)				
		None				
	Heat recovery system	Yes		No		
	Gas temperature (ºC)	On entry to the treatment system				
		On exit from the treatment system				
	Output gas flow (m3/h, dry base)					
Furnace n	Idem anterior					
Wastes	type		destination			
	type		destination			
	type		destination			

Transport

The enquiry was made at the time of updating the inventory. Part of the information is in the BEN and another part from enquiries to ANCAP, AFE, importers of lubricant oils.

Company / entity	ANCAP								
Contact	Name		Position						
	Telephone								
	Fax		e-mail						
Lubricant oil for 2-stroke engines (Sales in litres) domestic market			Ratio recommended use						
Fuels. Sales (in m3)	to domestic market	Type					m3		
		Type					m3		
		Type					m3		
		Type					m3		
		Type					m3		
		Type					m3		
	marine (bunkers)	Type		Flag			m3		
		Type		Flag			m3		
		Type		Flag			m3		
		Type		Flag			m3		
		Type		Flag			m3		
		Type		Flag			m3		
		Type		Flag			m3		
		Type		Flag			m3		
		Type		Flag			m3		

Company /entity	COMPANY SELLING LUBRICANTS for 2 stroke engines			
Address				
Contact	Name		Position	
	Telephone			
	Fax		e-mail	
Lubricant oil for 2 stroke engines (Sales in litres, domestic market)				
Ratio recommended use				

Company	State Railway Administration					
Contact	Name		Position			
	Telephone		Fax			
	e-mail					
Fuel Locomotive consumption	Type		Volume (in litres)			
	Type		Volume (in litres)			
	Type		Volume (in litres)			
	Type		Volume (in litres)			

Uncontrolled combustion processes

The enquiry was made at the time of updating the inventory

Entity	National Fire Brigade				
Contact	Name		Position		
	Telephone		Fax		
	e-mail				
Fires in structures	Number of affected structures				
Fires in vehicles	Number of incidents				
Forest fires	Type of vegetation		area affected (ha)		
	Type of vegetation		area affected (ha)		
	Type of vegetation		area affected (ha)		

Production and use of chemicals and consumer goods

Declaration form.

Company	PULP AND PAPER SECTOR					
Address						
Contact	Name			Position		
	Telephone			Fax		
	e-mail					
Type of Industry	Pulp					
	Paper	Primary				
		Recycled				
	Integrated pulp and paper					
Consumption of raw material Type and quantity (t/year)						
Chemical bleaching	Yes		No			
Bleaching sequence						
Production (t SA/year)	product		volume			
Product recovery	Black liquor boilers	Fuel (t/year) indicate base				
		Generation of ash		(t/year)		
				destination		
		Gaseous emission treatment system (brief description)				
		Material retained in gaseous emission treatment system		(kg/year)		
				Destination		
	Dregs	(t/year dry base)				
		Destination				
	Lime oven	Fuel used (t/year) indicate base				
		Yield				
		Gaseous emission treatment system (brief description)				
		Material retained in gaseous emission treatment system		(kg/year)		
				Destination		

Biomass boiler	Fuel used	Type		(t/year) indicate base	
	Ash generated				

Company	TEXTILE SECTOR			
Address				
Contact	Name		Position	
	Telephone		Fax	
	e-mail			
Use of chloranil-based colorants (type, volume) Use of organichloride finishing products (type volume)				

Company	LEATHER TANNING SECTOR			
Address				
Contact	Name		Position	
	Telephone		Fax	
	e-mail			
Use of biocide agents (type and volume)				

In the event chloranil or chlorinated agents are used, request complementary information on volumes of production.

Dry cleaning

Declaration form.

Company	DRY CLEANING			
Address				
Contact	Name		Position	
	Telephone		Fax	
	e-mail			
Use of organic solvent agents	Type			
	volume of consumption			
Generation of dry cleaning waste	Type			
	Volume generated			
	destination			

Composting

Declaration form.

Company					
Address					
Contact	Name		Position		
	Telephone		Fax		
	e-mail				
Inputs	Type of inputs (origin)				
	Volume of consumption				
Type of segregation (in situ, at source)					
Production	Type of process				
	Volume				
	Humidity content				

Wood treatment

Declaration form.

Company					
Address					
Contact	Name		Position		
	Telephone		Fax		
	e-mail				
Products used	Type				
	volume of consumption				
Waste generated	Type				
	volume				
	destination				

2.3.5 Observations on the transport category.

1) Transport:

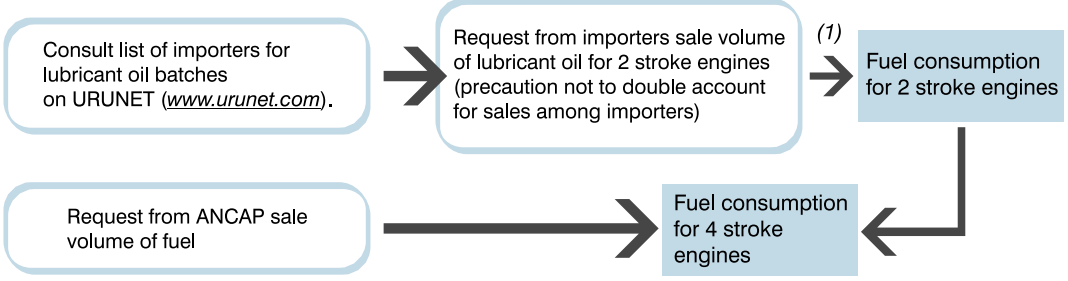
1.a)2 and 4-Stroke engines

The National Fuel, Alcohol and Cement Administration (ANCAP) provides information on the volumes sold but cannot discriminate between those used for 2-stroke or 4-stroke engines as some fuels can be used for both.

The consumption for each type of engine is estimated on the basis of lubricants for 2-stroke engines and proportion of use (r = 40 ml. lubricant oil / litre of fuel):

combined consumption 2-stroke engines (combined litres) = oil consumption 2 stroke (litres oil) x 1/r (litres fuel / litres oil.) (1):

Diagram 2.3.1- Fuel consumption for 2 and 4 stroke engines.



1.b) Diesel engines

The consumption of diesel oil in the transport sector is taken from the National Energy Balance which includes ships flying the national flag. In order to add the consumption of ships flying foreign flags the information has been requested from ANCAP discriminated by national flag and foreign flag.

1.c.) Fuel oil engines

The same procedure as for diesel oil.

2.3.6 Consultations with potential releasers

Once the draft version of the inventory has been obtained a workshop is held with the various sectors identified as potential releasers and with the entities and institutions that supplied information to prepare the inventory.

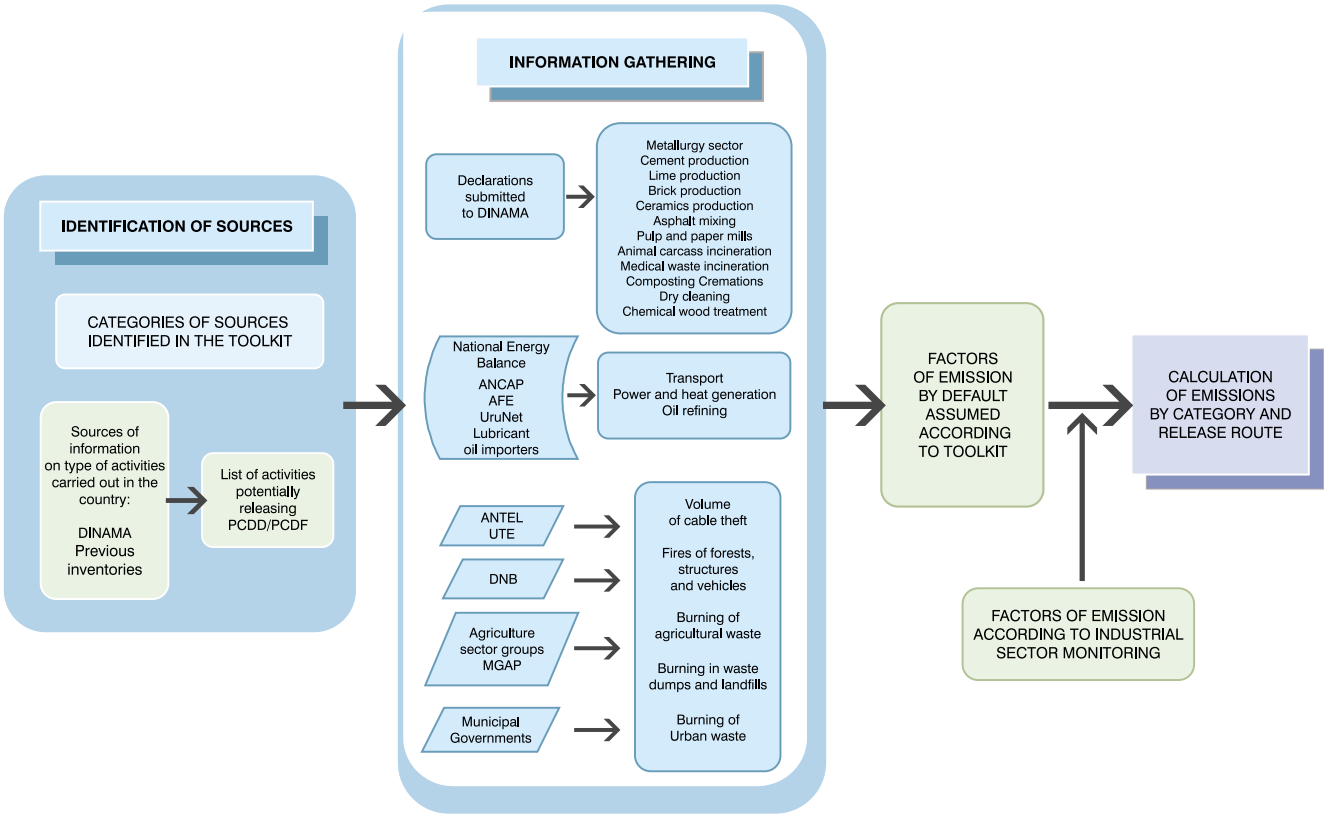
The aims are to:

- Return the information obtained
- Establish a forum for discussion
- Request inputs, opinions or suggestions on the methodology and procedure used

Once these comments have been analyzed, the final version of the inventory is prepared.

2.3.7 Summary of the methodology

Diagram 2.3.2- Proposed methodology.



Annex 3
Implementation Activities and Final Products

This annex features a brief description of the activities and products completed during the process of putting together a National Implementation Plan of the Stockholm Convention in Uruguay.

In the course of this period, different activities carried out allowed us to learn more about the national situation regarding POPs, sensitisation and training in the different areas of the Convention, with broad participation, interest and commitment on the part of those involved.

In order to reach the expected objectives, different opportunities were promoted ranging from the organization of seminars, workshops and training sessions both in the capital city as well as in the rest of the country, generation of databases and even the publication of inventories, descriptive brochures and technical registers. In addition, interaction was sought between the Project and other public and private institutions, as well as civil society organizations, in order to determine action lines and validate the procedures and guidelines developed.

To this end, as part of each programme, databases were generated and their feedback was permanent as the progress in the different activities started producing results. Furthermore, each of the seminars and workshops were devised in such a way as to have the valuable contributions from different key actors in each thematic area and thus secure their effective participation.

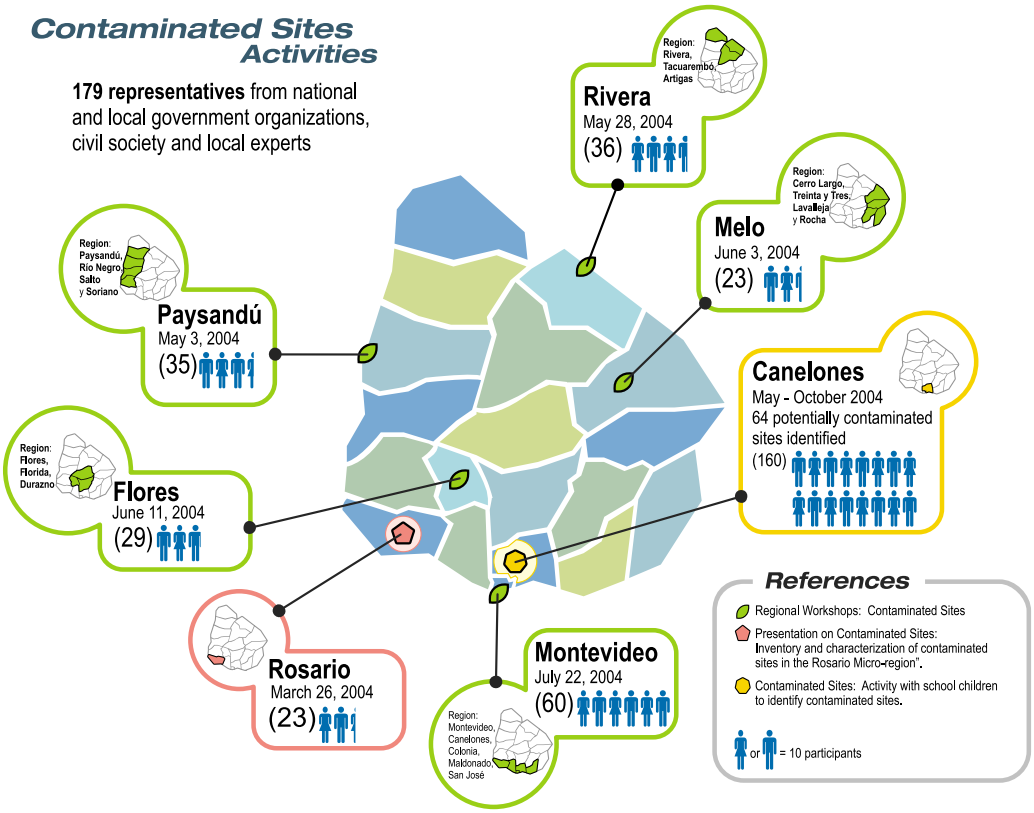
Afterwards, the knowledge acquired during training was directed to the population in general and to other key actors involved in daily national activities.

The development of all these activities was a key element in assessing the national scenario to formulate a Plan by consensus.

ACTIVITIES CARRIED OUT

• *Regional seminars on Contaminated Sites*

Several activities were developed across the country to disseminate experiences and provide training in the identification, preliminary evaluation and management of contaminated sites. Additionally, the seminars were used as part of the methodology to identify potentially contaminated sites. Technicians and representatives of local governments, NGOs and other environmental and health-related experts participated in these events.



• *Regional Sensitisation seminars*

Participatory activities carried out involved the formal education sector and civil society organizations from all over the country. They were identified on the basis of their capacity to disseminate information received and help in the creation of social awareness.

Six Regional Seminars were held in Uruguay. Their purpose was to sensitise and inform participants from different organization on the Stockholm Convention and the effects of POPs in the environment, including human health. In addition there was exchange of information as during the activities the participants were encouraged to voice their opinions, make comments and relate their experiences in the subject.

Likewise, these activities helped identify the need for information and training required by these sectors given the issue in question.

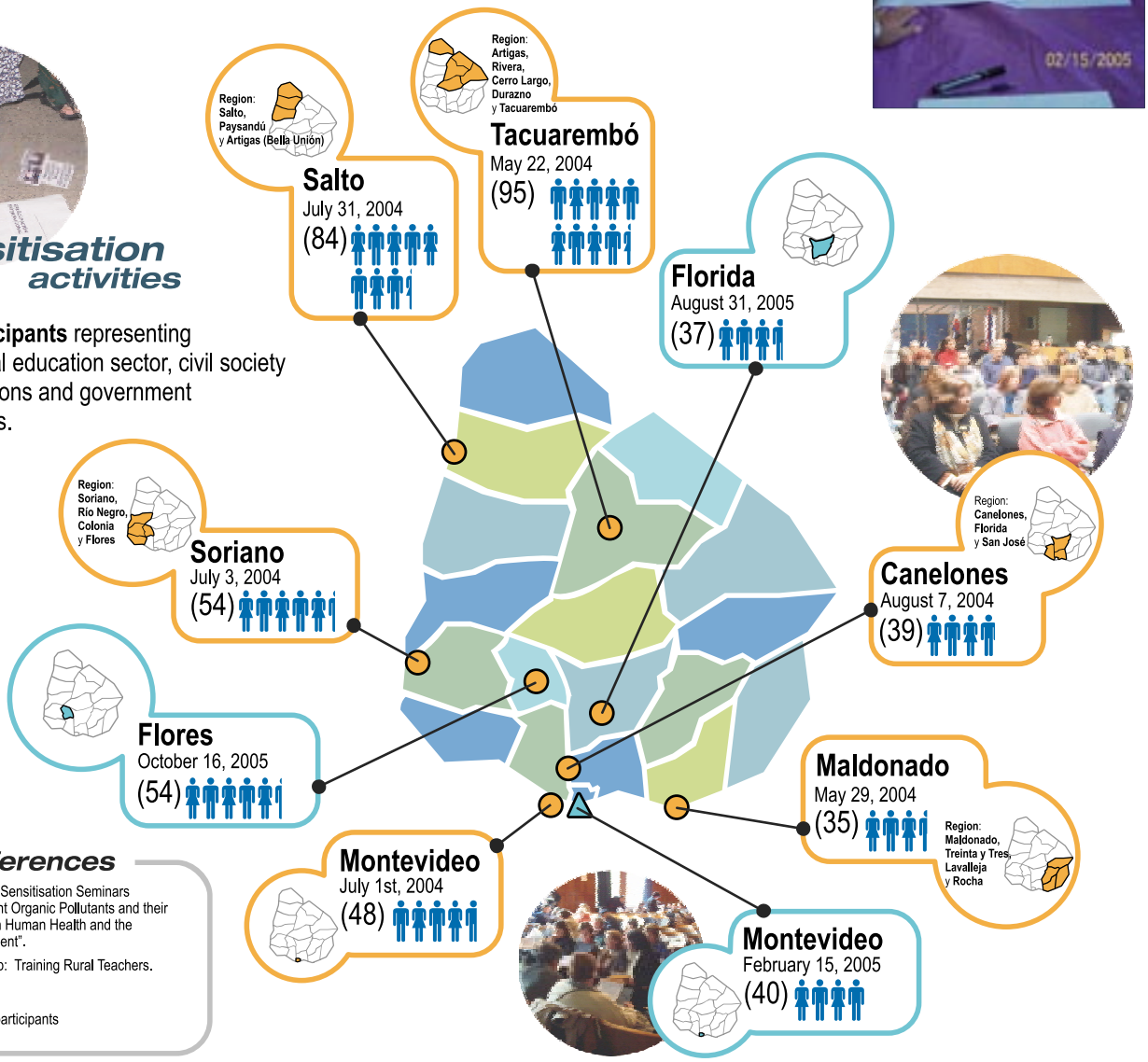
• *Ongoing workshops*

Several ongoing activities were carried out in response to requests for a more in-depth treatment of information received during regional sensitisation seminars.

With this in mind, training workshops for rural teachers were carried out nationwide, and also for secondary education students and students from rural technical schools. Topics developed

Sensitisation activities

446 participants representing the formal education sector, civil society organizations and government institutions.



ranged from chemical substances, the Stockholm Convention, characteristics of POPs and different health-related aspects linked to child vulnerability vis-à-vis chemical substances, with emphasis on pesticides and the triple wash of pesticide containers.

• *Workshop on hazardous chemical substances and waste management*

Programmes such as Contaminated Sites and Unintentional Emissions have identified non-controlled combustion of waste as a very significant source in the generation and release of Persistent Organic Pollutants (POPs) and that the inadequate disposal of waste may lead to soil and water contamination. Though these issues have been treated with different approaches, they all coincide in the need to create awareness and sensitisation of informal actors engaged in this task, mainly by sharing information with them.

For this reason, the Project team organized together with the Irregular Settlements Integration Programme (PIAI) a workshop where ideas and concepts relative to the management of household solid waste were shared, with special emphasis on how to minimize environmental risks, including health.

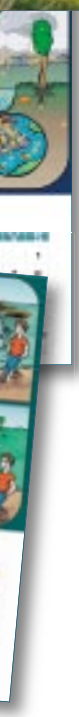
This activity resulted in the creation of a calendar with drawings and text prepared during the workshop. After publication, this calendar was handed over to the neighbours committee who were in charge of its distribution among families of Boix and Merino and social institutions and organizations connected to this neighbourhood.

PROGRAMME INTERACTION WITH OTHER INSTITUTIONS

• *Cooperation with the Irregular Settlements Integration Programme (PIAI)*

After detecting that old umping sites for household and industrial waste are areas likely to attract the development of irregular settlements-- that in the course of the last decade have been growing at a rate of almost 10% annually--, technical assistance was given to the Irregular Settlements Integration Programme (PIAI). In

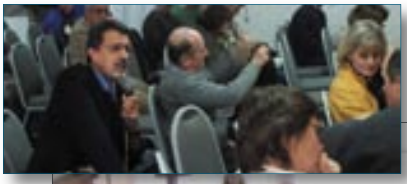
settlements where landfills with waste were identified, environmental characterization was conducted and modifications to Regularization Projects were proposed to prevent and minimize human health hazards.



• *Better environmental practices in cattle dips - BEP promotion in national production*

DINAMA, together with DGSG, the School of Veterinary and the School of Sciences of the University of the Republic, conformed a work group whose purpose is to assess and prevent environmental impact associated to the use of chemical products to control ectoparasite in ovine and bovine cattle and, in particular, the final disposal of cattle dips.

With the support of the British Embassy in Montevideo and the Project for the National Implementation Plan for the Stockholm Convention (NIP), between September 9 and 15, 2005, a technical cooperation mission visited our country, led by British expert Dr. Sean Burke, from the United Kingdom Environmental Agency.



Through this assistance and the integration of the above-mentioned work group, a strategy to implement better environmental practices in cattle dips in Uruguay will be formulated.

FINAL PRODUCTS

DATABASES

• *Contaminated Sites*

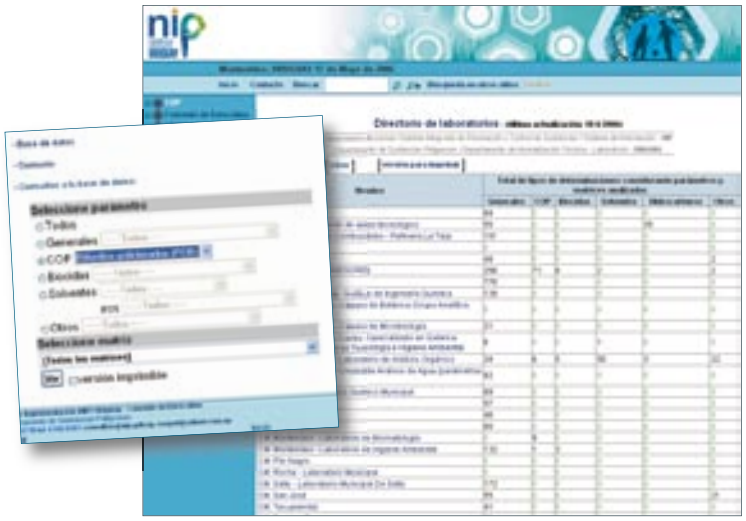
The information collected was consolidated in a database called PostGIS, accessible to DINAMA technicians through the intranet; it provides geographic information to locate sites following coordinates or patterns (it employs Mapserver to present interactive maps to the user), it allows for the permanent updating and the exchange of information and it is a fundamental tool to define priorities and make decisions on each one of the sites.

• *Academic Information*

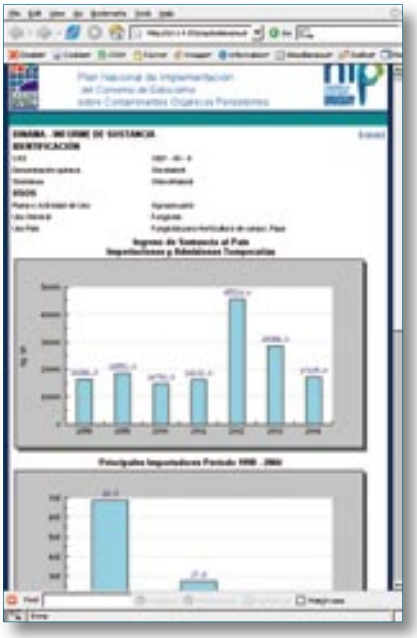
The database was put together by giving priority to information stemming from academic entities with the purpose of obtaining papers that demonstrate generation of both analytical and descriptive knowledge. The search sources were both at the domestic and foreign levels and were limited to papers on POPs.

• *National Analytical Capacity*

A preliminary collection of data on the national analytical capacity was conducted by developing a database on laboratories and creating a Directory of Environmental Laboratories. This is being used to organize information on the analytical capacity of our country. This database contains information on parameters and matrices determined by the labs, as well as the techniques for extraction and measurement used in the assessments.



• *Priority Chemical Substances*



It includes all information processed and qualified compiled by the project on a large number of priority chemical substances. This list is not limited to the "dirty dozen"; it was extended to include those of a particular interest both at the national and international levels. The database provides the users with a possibility to browse and print complete reports with all the information needed regarding physical and chemical, toxicological and eco-toxicological aspects as well as information on volumes entering the country, main importers, national and international uses. This list can be accessed through web applications in the intranet on national academic material on POPs and web links on chemical substances.

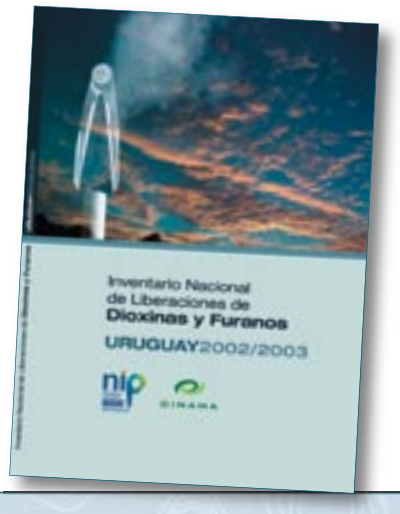
PUBLICATIONS

• *Uruguayan analytical capacity relative to Persistent Organic Pollutants (POPs). Situation and prospects*

The scope of this work is national and includes the public and private laboratories that conduct POP analyses in environmental and human matrices whose results are required in environmental management decision-making processes.

• *National Inventory on Dioxin and Furan Emissions in Uruguay 2002/2003*

The inventory features results obtained in the upgrading of the National Inventory on Identification of Sources and Quantification of Dioxin and Furan Emissions in the years 2002 and 2003. The preceding national publications are the National Inventory on Dioxin and Furan Emissions for the year 2000, produced in 2002.



This includes a detailed list of both formal and informal national activities likely to generate dioxins and furans.

- *Guide for the identification and preliminary evaluation of potentially contaminated sites*

The objective of this guide is to provide the basis for the identification of potentially contaminated sites at a local scale and to provide assistance for thephaseoneresearch in those areas: the identification of potential sources and contamination hosts. Some criteria are established on how to manage this research, procedures to facilitate this task and a harmonized system so that data obtained by different teams of researchers are comparable, have been included.

GAMES

- *Educational and entertaining material on the environmentally sound use of chemicals*

As from the implementation of sensitisation seminars, through an evaluation form where participants stated their needs, a priority to create specific educational material on chemical substances was detected.

For this reason, DINAMA/NIP Project launched a call inviting civil society organizations from all over the country to present proposals on the elaboration of educational material.

The technical proposal, institutional background and the team proposed by Iniciativa Latinoamericana, national social organization with a marked educational profile, were evaluated as the most appropriate to develop these products.

The project included the preparation of a set of educational games in digital and hard-copy formats, for two age brackets: children from 8 to 11 and adolescents from 12 to 18. The conceptual framework is based on the environmentally sound use of chemical substances in daily life and the risks associated to them. In addition, special events were organized to test the material and train 150 teachers nationwide in the use of this educational games.

The production and design of this set of educational material was broadly coordinated between the institution and NIP Project staff.

DISSEMINATION MATERIAL

• *Brochure*

In order to disseminate the characteristics of the Convention and is implications, a brochure was designed combining its content with the visual aspect to allow a quick understanding of the project and its reference framework.

The visual attractiveness of the brochure was carefully sought in an attempt to draw initial attention to a subject unknown to many.

When thinking about its contents, many factors were taken into consideration such as the language to be used, the type of information and the core message we meant to convey.

Thinking of an heterogeneous public, the language chosen was simple and technical terms were explained to facilitate understanding of the message.

The issue of the "local" was also taken into account; it is clear in the message (and in the design) that the brochure belongs to the Oriental Republic of Uruguay and that it refers to what our country is doing as regards the Stockholm Convention.

• *Information Leaflets*

Information leaflets were prepared on subjects like Contaminated Sites, Unintentional Emissions, Pesticides, Stockpiles, Triple Wash, Academic Information, Institutional Capacity, PCB, Life cycles of Chemical Substances, Integrated Information System, Tools for Prevention and Sensitisation, Awareness and Dissemination. The objective of the different leaflets was to present in a graphic way the different aspects studied.

This turned out to be a fundamental support material at different stages of the project presentation and, in particular, in the different areas under study.

• *Design and permanent updating of the Website*

Internet website, domain www.nip.gub.uy

Its structure and contents were designed in a traditional way seeking a user friendly interface that would allow for a rapid understanding of the functions and easy location of the information.

When considering the contents of the website, attention was paid to the surfers of the Internet so they could find basic texts on the Stockholm Convention and the Persistent Organic Pollutants as well as texts and/or documents that are more technical and addressed to a more specialized public. The page was also intended as a reference website on this issue; from this point other recommended websites can be accessed. It must be pointed out that from this website one can access many of the databases of the other programmes developed.

• *Stand*

During the Meeting of the Parties held in May 2005 in Punta del Este, Uruguay, a stand was designed and exhibited featuring a summary of activities and action lines identified at that particular moment in time.

Annex 4

Socio-Economic Evaluation, Approach, Methodology and Limitations Detected

INDEX

I. Objective of the Report

The following are the objectives of the report:

1) Briefly introduce some of the concepts, tools and methods of the socio-economic analysis in the management of hazardous chemicals.
2) Present some suggestions relative to the collection and management of information to help DINAMA conduct economic analyses in the future.
3) Conduct economic quantifications whenever possible (that is, in those cases where information was obtained) in terms of the costs of different management options to attain the objectives set forth by the Stockholm Convention.
4) Present some policy-related recommendations by proposing some economic instruments.

The report is built around these objectives.

II. Some basic economic concepts

This section first presents a brief explanation on how Economics approaches the environment; this approach is presented under II.1. The second part introduces the different types of economic analyses.

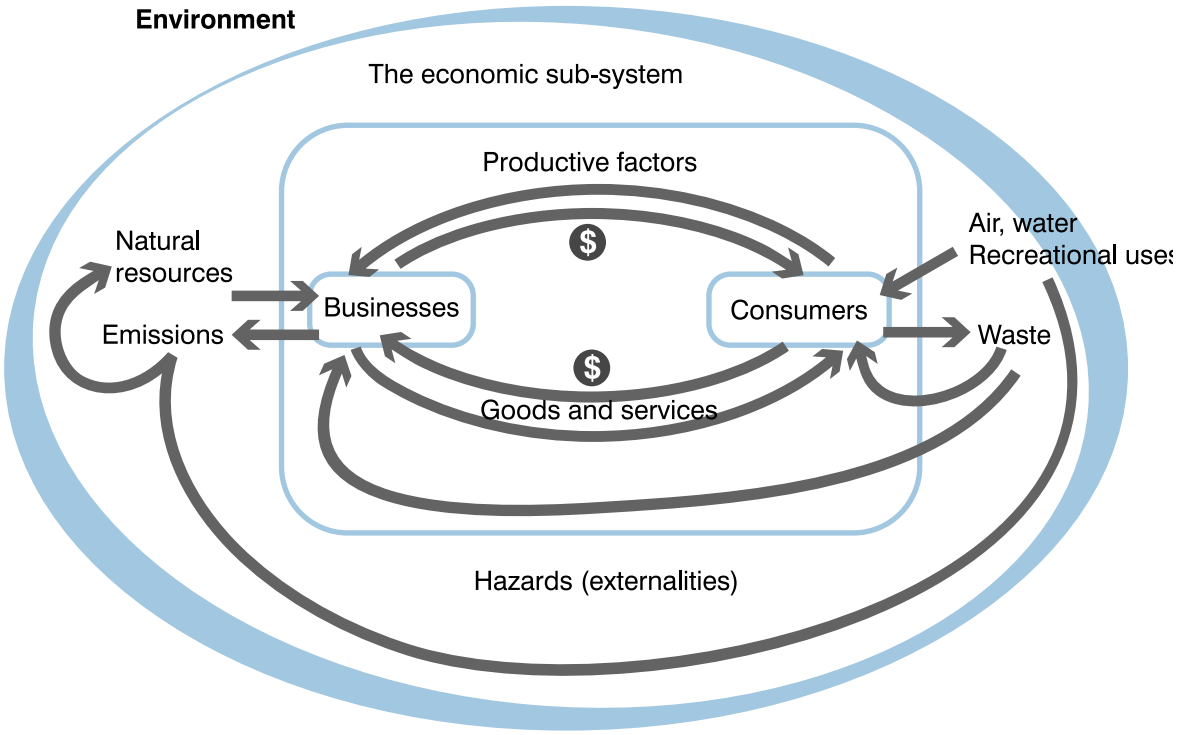
II.1. ENVIRONMENTAL DEGRADATION ISSUES AS SEEN BY ECONOMISTS

The economic system consists of 3 major agents:

- Consumers
- Businesses
- Regulator(s)

The flow of goods, services and money across consumers and business firms represents an economic system that appears as a sub-system within the environmental system as illustrated in Figure Nº 1:

Figure 1: The Environment and Economics



To put it simply, consumers (households) sell productive factors to businesses and thus obtain payment that is used to buy goods and services that the companies produce. This constitutes the economic sub-system. This is not a closed system. It receives from the environmental system that contains it and provides it with raw material and energy in the shape of natural resources that become input for companies and "consumer goods" for the consumers (for recreational uses, for example), apart from supporting life itself and therefore all the economic sub-system. The environment is also used by businesses and consumer as a deposit of waste ("Emissions" and "Waste" in Figure Nº1).

None of these interrelations between the economic sub-system and the environment is fully captured by markets. For example, waste produced by consumers pollutes water courses and air and causes hazard to consumers themselves and businesses. Likewise, industrial emissions pollute the air and water courses causing damage on their own businesses and the consumers.

These "hazards" represent costs for third parties (and for society as well); these costs are not being taken into account by those who produce them. For this reason we call them external costs or simply "externalities". As markets fail, given the lack of regulation (or in a more general sense, in the absence of standards or institutions, either formal or informal) contamination (and its resulting hazards) might be "too" high. In Economics, the term "too" means not efficient. But what would be an efficient pollution level? An efficient level of emissions is the one that maximizes the net benefits of emissions for society. In other words, emissions have costs but they also have benefits (lower production costs for the goods we consume). There will be a level where the difference between the benefits and costs of emissions (the net benefit) is the maximum. This would then be the efficient level of emissions.

From an economic point of view, the objective of a regulator should be to implement the efficient level of emissions. This requires a cost-benefit analysis in order to determine which level of emissions produces the maximum net benefits. However, in practice this becomes an impossible task. What regulators do in some cases is to conduct a cost-benefit analysis of a change at the level of total target emissions. For example, would it be desirable from an economic standpoint to reduce the current level of emission by 10%? Nevertheless, this local cost-benefit analyses are hard to implement. In the first place, only businesses know about their abatement costs, whose savings represent the main benefit to release emissions. Secondly, damages to third parties produced by these emissions are very hard to estimate. In both cases information can be obtained within some margin of error; however, obtaining it may be very expensive.

It is because of these difficulties that an alternative policy objective was sought to replace that of attaining an efficient level of emissions. This objective is known as "cost-effectiveness". It consists of minimizing the costs of attaining a certain environmental quality or a given total level of emissions in the case of a chemical substance. As the costs to reduce the pollution level will be mostly given by the costs businesses will have to incur into reduce their emissions, what is minimized are the costs of emission abatement. In this case the problem facing the regulator would be:

$$\min_{e_1,\ldots,e_n} \sum_i C_i(e_i)$$

$$\text{subject to } \bar{E} \geq \sum_i e_i$$

Where $\bar{E}$ represents the regulator's level of total target emissions. This is the case of NIP, for example. Though this is a very special case in cost-effective regulation as the objective of organic pollutants emissions that appear on the NIP list is zero. But we will come back to this later on.

The way in which the regulator can solve the problem of minimizing aggregated costs of abatement reaching $\bar{E}$ is through the allocation of emission "quotas" to different businesses. The regulator chooses the allocation of emissions by selecting a policy instrument to reach $\bar{E}$.

The intention here is not to repeat what many textbooks on environmental economics state but rather try to classify some of the environmental policy instruments according to type, and briefly comment how each of these two major types classify vis-à-vis the objective to minimize abatement costs.

Environmental policy instruments can be classified into two major types: the "command and control" type and the economic type. The first group gets its name because it is based on a requirement (an order or command) and compliance requires some type of control. A non-restrictive or maybe unfair list of command and control instruments may consist of two sub-types: (1) emissions standards and (2) technological requirements. We call emission standards the maximum levels of emission set forth by the authority for each business enterprise. In general, these standards are uniform, that is, the limits set forth by the regulator are the same for all sources. This is a very important characteristic from the perspective of the disadvantages that uniform standards provide from an economic viewpoint. However, through technological requirements or standards, the regulator imposes certain technologies on the companies. This type of instrument classifies as indirect regulation of the level of emissions as the regulator does not fix the level of emissions directly but by determining a certain production technology or abatement of emissions. In general, it is easier to monitor compliance with technological requirements than monitoring compliance with uniform standards of emission, as it is easier to check whether a certain technology is installed and is being operated correctly than to check is emission limits are in conformity, let us say, 90% of the time. In this case real time technology is required to measure emissions at the tip of the pipeline or stack. That is why many regulators, especially those with significant budget restrictions, chose to impose technological requirements (instead of emission standards) to the sources they regulate.

As part of the economic instruments we have: (1) taxes on emissions; (2) subsidies to emissions reduction; (3) Transferable Emission Permits; (4) Deposit Systems—reimbursements; (5) Taxes on products; (6) Subsidies to clean technologies and (7) definition of property rights. What all these instruments have in common, and the reason why they classify within the category of economic instruments is that their coercive power is based on the change of relative costs of regulated sources and not simply on a banned behaviour (emissions above a certain level, in this case). Economic instruments act on the incentives of the regulated sources to change their behaviour. As companies (and people) in general maximize their profits, imposing a tax on their emissions or creating an emission permit market, results in an increase of their emission costs and this mechanism can help to point out to them that the environment is a limited resource and needs to be used more efficiently. Naturally, when businesses see the increase of their emission costs will be more encouraged to look for technological and technical mechanisms to reduce emissions. The greatest advantage of economic instruments over the command and control ones is that they act on the incentives of benefit-maximizing companies and they make companies with lower emission abatement costs to release less emissions (therefore, paying less taxes or buying less emission permits) while companies with higher costs will end up by releasing more emissions. This "balanced" situation produced by economic instruments reduces (in fact, minimizes) the aggregated abatement costs the society must incur to attain the target level of environmental quality.1

II.2. DIFFERENT TYPES OF ANALYSES

When the regulator decides to intervene in order to reduce the level of pollution or to reduce the use of any hazardous chemical, he must first of all determine the maximum level of the substance that will be allowed in terms of emission or use. Secondly, he must choose one of may different ways in which to attain that objective. One of the key aspects when choosing the maximum level of a substance that will be acceptable as a

1 This discussion presented in a summarized way can be found more in depth in any textbook on environmental economics. Therefore, we did not repeat it here. The following is a suggestion of texts that thoroughly deal with this issue: Field and Field (2003), Tietenberg (2006), Hanley, et al (1997), Baumol and Oates (1988), Russell (2001), and Xepapadeas (1997).

maximum, is the comparison of costs and benefits of the different levels. They will be fundamental to ensure compliance with the standard that is determined as the maximum accepted. It is in this aspect of the regulation where we introduce the cost-benefit analysis. Secondly, once the environmental standard or target level is determined, the regulator must choose the mechanism to attain such goal. In other words, the regulator must select one of the different policy instruments to be implemented. To do so another type of analysis is needed, such as the cost-effectiveness analysis (that compares the costs of different alternatives), the employment impact analysis (that compares net jobs created or eliminated by each alternative), the distributive impact analysis (that compares how to distribute benefits and costs resulting from the different alternatives), etc. The regulator will choose from these varied analyses after weighing each one of them in relation to his political objectives.
The following is a summarized presentation of the different types of analyses:

II.2.1 COST-BENEFIT ANALYSIS

The objective of a cost-benefit analysis is to compare current value of costs and benefits that may be present or appear in the future of a project, programme or measure. It indicates whether the project or programme is advancing in the right direction in terms of social aspects: whether benefits are higher or lower than costs.

II.2.1.1 Types of costs and benefits in controlling POPs use.

In the specific case of NIP, the policy objective is to reduce or eliminate the use of POPs. The elimination of these substances implies costs and benefits. In general, costs can be grouped into the following categories:

- Reduction of company benefits: companies do not bear in mind external costs they generate on third parties whenever they use POPs. Assuming these costs requires the incorporation of substitute substances (pesticides, oils, etc.), alternatives in terms of production processes, etc. This means higher costs for the business enterprise.

- NIP implementation and administration costs: regulation is not zero cost. It requires resources. One part of these resources are used up in the implementation and administration of the regulations in force. The implementation of measures suggested to attain the objectives of the Stockholm Convention will demand resources from DINAMA, but also from other public agencies such as the National Customs Authority, MGAP, etc.

- Control costs: any effective implementation of a regulation requires some kind of control to ensure compliance. This control involves activities to monitor environmental quality and emissions quality as well as sanction-related activities.

The following are some examples of the potential types of benefits of the different NIP programmes:

- A lower number of hours/illness for the country population.
- A lower number of premature deaths.
- Enhanced environmental quality.

In Economics, personal benefits are estimated on the basis of the beneficiary's willingness to pay (WTP) for that benefit. In the case of goods and services sold in markets, prices paid by their consumers give us a clue as to the WTP (marginal) on the part of potential beneficiaries. However, many of the benefits (and costs) involved in the regulation of hazardous chemicals and their pollution, are not captured by the markets. For example, there are no markets where people buy and sell units of environmental quality. This represents a problem in terms of implementing a cost-benefit analysis on a programme to enhance environmental quality (and human health) by controlling a POP, for example.

There are, however, different methods to measure these benefits on the basis of an estimation of

the WTP. These methods are briefly introduced below. For additional in-depth information, the reader is once again invited to refer to the texts included in the previous footnote as well as to other future references.

II.2.1.2 Methodological tools: valuation techniques or methods

Basically, there are three ways to proceed with an economic valuation of aspects related to pollution and preservation of natural resources. The first one is to measure the monetary value of pollution impact by quantifying the current costs. The second is to try to estimate the WTP for enhanced environmental quality. This second type is divided into direct and indirect methods. The third way is to transfer previously estimated benefits to other cases. The three methods are described as follows:

(1) Quantification of pollution-related costs

Pollution produces harm or damage. In consumers, for example, it may result in disease. In companies or productive units, it may lead to loss of benefits. Therefore, these losses can be estimated to determine the value of pollution costs (or the benefits of a programme aimed at preventing such costs).

Let us concentrate on the case of pollution effects on human health. Let us consider, for example, the consequences of asthma. If a person gets sick, this implies direct economic costs: hospital admission, emergency services, visits to the physician, medicine, etc. But that person also incurs in indirect costs (opportunity costs): absenteeism (school absenteeism in the case of children, work absenteeism in the case of adults), etc. The latter is easier to estimate if we know the daily wage or the daily benefits perceived by the worker. In any case, if the person dies, the economic value not generated by the deceased can be calculated. (Of course, this does not refer to the value of human life, nor is it the value of an individual in particular, as these values will tend to be infinite. This would represent the value of a "statistical" type of life).

In the case of business companies, the idea is very similar: to measure losses caused by environmental impact. These losses may derive from loss of crops, in the case of farmers who are victims of some type of pollution, for example. The goods lost because of pollution have a market value and that price can be used to calculate the cost of contamination. This cost can also be presented as an increased production cost to maintain the same productivity. The amount of additional money the farmer used to maintain the same level of productivity, is a measure of external costs borne by the farmer because of pollution. For example, atmospheric pollution reduces the yield of crops and the growth rate in forestry. Water pollution reduces agricultural yields and fish catches. Soil pollution reduces agricultural and cattle breeding yields.

This method can be used to measure another pollution-related impact in economic terms: the deterioration of material/surfaces of buildings, statues, etc. In all these cases the change can be estimated in terms of maintenance/premature replacement costs.

In all cases we need to know the dose-response function: the level of impact in the target that will be valued given different exposure levels to different pollutants in the air, soil, water.

Needless to say, these methods pose clear disadvantages. First, they are incomplete. They underestimate the value of damages. In the case of impact on human health, for example, they do not include the monetary or physical contributions by relatives and friends outside the market. They also allocate a lower value to people with disabilities that are not working and to the jobless. Finally, one might say that these methods do not allocate value to pain and suffering caused by a disease.

In the second place, they do not take into account the fact that people take steps to avoid hazards: farmers affected by pollution may change their crops/activity while citizens affected by transit noise may install double-glaze windows. Behaviours to avoid damage reduces damage, therefore, if not taken into consideration, we are underestimating the costs of pollution.

Whether we are underestimating the economic effects of pollution or not, if we only use these methods they become essential. In this sense, the lack of information that is pointed out further on derives from the need to conduct this type of costs quantification.

(2) Estimating the WTP

Quantification of pollution-generated costs in the previous section must be complemented in many cases with the estimation of the WTP of those affected by the improvement proposed. (Or, in some cases, with the willingness to accept a compensation: WAC). These methods are briefly presented as follows:

Indirect methods

The basic principle governing these methods is that people reveal their environment-related WTP (or their WAC) when making decisions as to market goods related to those environmental characteristics, namely:

I. Averting costs method

If people can prevent certain effects of air pollution in a city by purchasing air-conditioners, for example, that cost is an indicator of how that person values clean air (and all its consequences). This method corrects the error mentioned before as it takes into consideration the behaviour of those affected when they try to prevent damages.

II. Hedonistic price method

a.The value of a statistical human life expressed in salaries:

In fact, people do not behave as if the preservation of life were the ultimate goal all their resources are aimed at. If it were so, people would not be involved in risky activities such as boarding a plane, smoking, parachuting, etc. At the same time, other people avoid risks: they buy padlocks, alarm systems, insurance, they do not walk dark lanes, etc. This suggests that people make decisions relative to the risk of death and these decisions can be used to evaluate WTP relative to a lower chance of death. We do not refer to the type of situation where a person is asked about his WTP for his life or that of his child (or someone in particular). We refer to a "statistical life": that of a random individual that is part of a group. This does not refer to a real life or specific individual. Thus we can calculate the value of a statistical human life given salary differences ("Hedonistic Salaries") in jobs with different levels of risk.

b. The value of environmental quality expressed in real estate prices:

The price of houses can be broken down into different attributes: structural characteristics of the dwelling (square meters, number of rooms, etc.), neighbourhood characteristics (level of safety, proximity to shops, etc.) and environmental characteristics (quality of air, noise level, proximity to the sea, parks, view, etc.). Accordingly, econometric techniques can be used to estimate the WTP for better surroundings by statistically "comparing" houses with similar characteristics but located in environmentally different surroundings.

c. The "cost of the trip" method

This method is widely used to value natural surroundings such as parks, etc. The idea is that people travel to enjoy a natural park, to camp, go fishing, go to the beach. They incur in costs: commuting time, fuel, automobile maintenance costs, meals, accommodation, etc. We can use these costs to estimate the WTP for changes in environmental quality. If the environmental quality of a destination spot improves and, in consequence, more people start visiting that

place and/or the same people go there more frequently, we can interpret that these additional costs of more people travelling there represent the value of this enhanced environmental quality. Of course, to do so we need information on costs, points of departure, income levels, availability of leisure, travelling expenses, a large sample of tourists.

The "averting costs" method is based on the possibility of substituting a private good (medicine, physicians, air-conditioners, etc.) and a public good (air quality, etc.). The "cost of the trip" method is based on the complementarity of both (I must go by car, use fuel, etc. to enjoy an environmental good).

Direct methods

d. Contingency Valuation Method

The main shortcoming of previous methods (indirect methods) is that they omit benefits stemming from the non-use of the natural resource. For example, people may experience benefits simply by knowing that certain habitat will be preserved, without a need to visit that place and enjoy its beauty at some point in life. These types of benefits are known as "existence benefits". People value something simply because they know that it exists, even when they might never plan to visit the place. This type of benefit is not perceived by indirect methods because the individual does not consume in relation to these benefits.

This method allows for the detection of any type of benefit as it is based on questions asked directly to the persons as to the value they give to a certain place or change in the environmental quality or type. That is, the method is based on a simple idea: in order to learn how willing people are to pay for changes in one characteristic of their surroundings, you just ask them. Its very name, "contingency" means that you ask the people what they would do given certain unexpected events. The method has been applied to air quality, landscapes, beach quality, protection of species, visitors density in natural areas, hunting and fishing, disposal of toxic waste and other cases not related to the preservation of the environment.

The method present obvious disadvantages. Two of them are: the bias resulting from answers by interviewees as a result of the hypothetical nature of the questionnaire and—something that is more relevant in developing countries such as Uruguay, the WTP for a reduction of pollution or a reduction in the risk of exposure to pesticides, will depend on the income level of the interviewee.

e. The Conjoint Analysis

In the Conjoint Analysis the interviewees are faced with a choice between different combinations of attributes of the same good. By changing one or more attributes, the interviewees are asked to rank the different combinations according to their preference. This ranking reveals marginal substitution rates among the different attributes. Including price as an attribute we can obtain the WTP for the change in one of the attributes of the good.

Conjoint uses four multi-attribute demonstration formats:

1) Two-fold or contingent option: the interviewees are asked to chose their preferred alternative between two or more options with different levels of attributes. The Conjoint Analysis emphasizes choices between hypothetical alternatives on the purchase (WTP) of an environmental amenity. The advantage of this format is that it reduces the "protest" answers (WTP is amoral).
2) Contingent ranking: In this format the interviewees must rank the alternatives starting with the one they prefer the most and ending with the one they prefer less.
3) Contingent rating: The interviewees score the different alternatives with a numeric scales (for example, from 1 to 10). This format provides more information on the interviewee as it shows how much more he/she prefers one alternative to another. However, preferences thus revealed may be less precise.

4) Rating in pairs: The interviewee is faced with pairs of options and is asked to score with a numeric scale. Pairs keep changing.

The advantages of the Conjoint Analysis are several, when compared to the Contingency Valuation method:

5) The interviewees do not have to value environmental goods or services explicitly in terms of money. Therefore, they feel much more at ease as it is easier for them to rank or allocate values on a scale to "baskets" of attributes (including the price) than giving their WTP. As price is not emphasized (presenting price as another extra attribute), the Conjoint Analysis minimizes biases that may result in the Contingency Valuation method when interviewees are faced with the less familiar or less real problem of pricing environmental goods.
6) Stresses the different choices in terms of attributes.
7) Allows for a more detailed analysis of alternatives.
8) Allows for more precise answers due to "learning".

Transfer of benefits[2]

Finally, there is a method that escapes the former classification of direct and indirect valuation methods. The method is called Transfer of Benefits and consists of using valuation exercises carried out previously and/or in other places, and to extrapolate (transfer) the estimations of benefits (WTP) to the case in question.

It is an ideal method to be applied in the context of developing countries as its advantages are the ones of a method to be applied in the presence of major budget constraints (among other cases) that prevent a preliminary study using any of the previously described methods. Undoubtedly, budget restrictions are a reality in less developed countries and even more so in relation to the environment. Furthermore, when scanty local funds are complemented with international funding, as is the case of this Plan, preliminary studies are still very difficult to conduct as the generalized budget restriction of the country does not allow for preliminary information that may be used to conduct such studies. Therefore, the transfer of benefits method is still the best alternative available to conduct valuation exercises in these cases.

Further ahead we will include the results of the application of one of the techniques used in the transfer of benefits in the case of pesticide control in Uruguay. For this reason, the method is presented in more detail:

There are different ways to transfer benefits from other studies. These ways are basically classified into two types: (1) the transfer of a value, (2) the transfer of a function. The transfer of a value includes the transfer of a concrete value that stems from a previous study and that is applicable to the case in question or the transfer of an average value from all previous studies conducted on whatever it is that must be valued. The transfer of a function implies the transfer of a function of benefits or a function of demand from a similar study, or the transfer of a value resulting from a statistical meta-regression analysis function. The following is a more detailed explanation of these methods, stressing the importance of average value methods and the meta-analysis function, as these were the methods used in the pesticide control case that is herewith presented.

(1) Transfer of a concrete value:

This method consists of using the estimated value of a previous study identified as relevant. The steps in this method to transfer benefits are: (a) identify (the risk of) impact on environmental quality and human health and other impact resulting from the use of a given POP, whose reduced use needs to be valued; (b) quantify such impact; (c) Check relevant literature on economic valuation of this type of impact; (d) analyse the relevance and applicability of the studies conducted; (e) select a measure of the benefit (marginal) of a study that is especially relevant or a range of measure in the case more than one study is relevant, and (f) multiply the measurement of the marginal benefit

2 This section is based on Rosenberg and Loomis (2001).

obtained by the total change in environmental quality or human health or both as quantified in (b). A confidence interval may be calculated if the original study reports the standard error of the estimation.

It is obvious that the critical aspect in this method is the applicability of the study(ies) selected to transfer the value.

(2) Transfer of an average value:

In this case, the ways to go about this method are the same as in the former case with the exception of item (e) that will now be as follows: to use an average value of the benefits estimated in the studies identified as relevant and applicable.
The average transferred value is not qualitatively better than the estimates it stems from. Therefore, a word of caution is also valid here regarding the critical aspect of applicability of selected studies.

(3) Transfer that uses benefit functions:

This method implies using a model that creates a statistical link between the benefit measure and other variables such as the characteristics of the population whose health is affected, the type of hazard and the environmental characteristics (parameters). There are two types. One occurs when the estimate of a health-related or environmental quality demand function is available. The other is the meta-regression analysis that we will explain below. In both cases the method implies adjusting the function to the values that the variables involved (characteristics of population, environmental parameters, etc.) taken into account for the specific case in question (Uruguay) in order to calculate the benefit.

The transfer of a value through a meta-regression analysis starts with the elaboration of a database by bringing together the databases of original studies for those variables such as characteristics of the target population, environmental characteristics, economic characteristics of the areas where the studies were conducted, willingness to pay and methods used in the original studies. With this new "meta" database a statistical relation is established between the measure of the benefit (WTP) and each one of the other variables. Finally, the value of these variables is adjusted to the case in question and the statistical function is also adjusted to obtain an estimate of the benefit.

This method presents clear advantages in relation to those methods than transfer a concrete value or those that transfer a value by adjusting a demand function:

a. The meta-analysis uses information on a much larger number of studies and is, therefore, more efficient in statistical terms.
b. The methodological differences of original studies can be controlled.
c. By adjusting the values of variables to values taken in the case to be measured, the researches is also controlling the differences between the case in question and the cases of the original studies.
d. The meta-analysis can estimate benefits for cases and places that have not been studied.

The limitations of the analysis are the same as the limitations of the transfer of benefits in general:

a. There must be a sufficient number of previous studies so as to establish a valid statistical relation.
b. The meta-analysis can only be as good as the quality of the studies it is based on.
c. The studies must be similar in terms of the type of variables included to allow for the building of a meta-database.

The analysis of this method will be taken up again when it is applied to value the external benefits of controlling the use of pesticides.

II.2.2 THE COST-EFFECTIVENESS ANALYSIS

By "cost-effectiveness" we understand the minimization of the costs to attain an objective. In this case the objective can be the ban to use a certain chemical, the achievement of a certain environmental quality relative to a determined parameter or the implementation of a maximum

limit to the total emissions of a given pollutant. Costs to be curbed will be basically two: (a) costs incurred by the sources of contamination when reducing their emissions or substituting the chemical in question to reach these objectives; and (b) control costs. The cost-effectiveness analysis then seeks to quantify the costs of the different policy options or instruments that are being evaluated for implementation, to help select these tools. The selection criterion is to choose the one that attains the objective with lower costs. These instruments are, in general, economic instruments.

The advantages of this type of analysis over the cost-benefit analysis is that it does not need to estimate any externality. The environmental quality objective (or the total amount of maximum emissions that will be allowed) is previously fixed (following political and environmental science criteria) and the only thing left to do is choose the cheapest way to go about it. This calculation will basically imply to take into account only private emission abatement costs (in the case of regulated businesses) and controlling costs (for the one being controlled).

Even though it is not easy to obtain private costs (precisely because of their private nature and because companies have a tendency to alter these costs when the regulator requests information on them), there are some methods to collect this information.

In addition, there is technical knowledge in the country on the best techniques available for production which can serve as basis for this calculation. As will be demonstrated later on, this information is essential to evaluate policy alternatives.

Regarding the costs of control (costs of monitoring and fines mechanism), these are fundamental and many times are not taken into account. It is difficult to calculate them as expenses for the necessary control to reach 100% compliance (or any percentage o compliance that needs to be attained) depend on the quantities collected by fines that are politically likely to be applied as the higher the fine applied the lower the number of necessary inspections to reach the compliance objective. Therefore, the latest estimation of this cost (very important) will depend on the political will of enforcing the regulations through the application of fines (or any other sanctions that involve economic costs).

II.2.3 THE ECONOMIC IMPACT ANALYSIS

Apart from making a partial cost and benefits analysis, the regulator may have other objectives and, therefore, the economic analysis may be directed to assess the impact of a given regulatory proposal, project, policy instrument in terms of: employment, GDP, etc. This type of analysis is called economic impact analysis. In general, geographic limits are determined to circumscribe it and reduce its difficulty.

The economic impact analysis may turn out to be an obvious cost-benefit analysis input if it is not comprised within one given activity, population, or area. In addition, it can also become an objective itself if we attempt to identify direct and indirect impact of the measure. It is essential to know about the behaviours of agents in the markets affected by the project.

For example, a key question to be answered (even from a theoretical point of view) is whether the adoption of treatment technology increases or reduces employment (or the production, and how much). In the longest term, the question relative to the effects of the growth rate of the economy, must be also answered.

II.2.4 THE DISTRIBUTIVE ANALYSIS

The distributive analysis or cost-benefit analysis weighed by distribution has the following objectives: (1) to identify which strip of the income scale bears the benefits and which strip bears the costs, and (2) to correct the fact that the traditional cost-benefit analysis does not distinguish between the person that receives benefits and the person that receives costs. To conduct this analysis, a dollar is a dollar regardless of who receives it. Consequently, the project is beneficial if the benefit is greater than the cost to be borne by the society “as a whole”.

However, the question of who bears the benefits or who bears the costs is of special importance in developing countries such as Uruguay. In this type of country it would be wise to report benefits and costs separately between rich and poor. Furthermore, there are three reasons to weigh these costs and benefits of the rich and the poor in different ways:

1) Decreasing marginal profit of income: one dollar for the rich must count less because it is of less "value" for him.
2) Distribution of income should be more equitable: a dollar of benefit for the poor must be more valuable than a dollar of benefit for the rich. As a consequence of this type of weighing, some "inefficient" projects must be implemented if they are able to enhance equality sufficiently, and other "efficient" projects should not be carried out if the increase inequality sufficiently enough.
3) The principle of "one person, one vote": in the conventional cost-benefit analysis the motto is "one dollar, one vote" and this implies evident regulatory arguments.

II.2.5 THE MULTI-CRITERIA ANALYSIS

This method seeks to avoid the "economy-driven reductionism" as it does not set prices nor estimate values and pursues the integration of other dimensions in project evaluation.

The method implies:

1) To identify regulators' objectives, namely:

    a. Environmental: preservation of soils, water quality, etc.
    b. Social: raise employment, distribution of income.
    c. Economic: reduction of costs, increased production, technological contribution, price reduction, increase of supply, foreign currency balance, fiscal income, etc.

2) To quantify indicators, for example:

    a. Preservation of soils = erosion (m3/year)
    b. Water quality = DO
    c. Raise employment = jobs per invested dollar
    d. Distribution of income = percentage of lower income sector perceiving benefits
    e. Technological contribution = qualitative ordinal scale
    f. Reduction of prices = project unit price/current price
    g. Foreign currency balance = project foreign currency net balance/invested foreign currency
    h. Fiscal income = per unit of investment

3) To "standardize" indicators
4) To weigh indicators according to the relevance of each objective.
5) To choose the project with the highest weighed average of standardized indicators.

II.2.6 RISK ASSESSMENT

The economic risk assessment starts, as most economic analyses, with the analysis of the physical information. For example, in the case of stockpiles, it is necessary to determine first of all the risk that chemicals might end up by polluting the water (this information will be provided by other scientists: engineers, geologists, etc.) and the potential impact on public health for the community involved. That is to say, to predict the levels of chemicals to which the population will be exposed and the expected effect on their health. One measure of this analysis will be, for example, the expected increase in cancer-related disorders.

The expected value (or mean, or most probable value) must be somehow estimated in terms of the elaboration of a distribution of probabilities. This can be produced with the historical series of accidents or by interviewing scientists who are

familiarized with the subject. Then the expected value of the amount of spilled oil or the expected value of a given hazard can be assessed. In short, the expected value of damages and benefits. The demands of this method are obvious in terms of the information on accidents and their effects, as well as in terms of dose-response functions and, of course, the information on emissions or hazardous chemical stockpiles.

Estimating costs and benefits implies sometimes having to respond in the way people value alternative situations that involve different levels of risk. That is, to what extent people are willing to pay to reduce risks they are exposed to. A way to go about it is by looking at their reactions in situations with a similar level of expectation that imply different risks. If the person is indifferent (compares expected values) we will say he/she is "neutral to the risk". If the person selects the safest situation (avoids losses) we will say he/she is "adverse to risk". There are many situations in environmental policy where aversion to risk can become the best policy criterion, including many of the ones covered by his Plan. Once regulators know how people value risks and the level of risk relative to environmental hazard situations, they must consider policies and regulations to manage such risks. For example, DINAMA must consider whether the sale of pesticide X must be allowed. The benefits will come from savings in production costs for farmers and consumers. Costs will be basically due to increased health risks in the case of rural workers and maybe also consumers. In this case, DINAMA must conduct a cost-benefit analysis where costs involve risks: some of these costs will be expected costs.

Another type of analysis is the one that compares risks. According to this type of analysis, if for example one must decide where to install a final industrial waste deposit, the regulator will compare the options from a technical perspective (isolation, soil permeability, proximity to inhabited areas or farms, etc.) and will then compare the expected values of the different potential accidents (if neutral to risk) and/or will avoid higher risks (if adverse to risk)

III. The Problem of Information Availability

In order to conduct a cost-benefit analysis on the Implementation Plan, Uruguay should have or should be able to generate the following information:

1) The types of current use for each POP.
2) The amounts employed in each one of the uses.
3) The substitutes available for those POPs in each different use.
4) The cost of the best substitute in each case.
5) The emissions or stockpiles for each POP in the country and their geographic distribution.
6) Future evolution in the use of each POP.
7) Quantify the concentrations of each POP in the environment (air, water, soil).
8) Quantify the level of exposure of the Uruguayan population to each POP.
9) Assess the impact of POP concentrations measured in (7) on flora and fauna.
10) Determine impact on human health. Probabilities for people exposed to develop some type of disease and/or die.
11) Assess the effect of chemical concentrations on the different productive and non-productive uses of natural resources: fishing, agriculture, tourism, etc.
12) Assess and quantify the impact of the proposed regulatory option (to eliminate the use of these substances) in the environment, public health and production.
13) Assess and quantify the impact on the regulator in terms of monitoring processes, reports, etc. to ensure compliance.

After this information is obtained on each of the POPs, the country will be in a position to apply the valuation methods presented before, in order to proceed with an economic valuation of the effects described in the preceding paragraphs.

The problem is that Uruguay has almost no information as regards the previous list. As part of the NIP a lot was done to collect information

or estimate part of this information in the case of some of the substances included in the Stockholm Convention. As part of this report some efforts were also oriented to generate some type of economic information in the case of concrete examples. However, in the majority of the cases the information was not obtained promptly because:

1) When it exists, it is scattered throughout different State offices and departments.
2) It is not presented in an adequate format (usually appears on paper only) and is, therefore, difficult to access.
3) There is some reluctance in many State offices to disclose this information to the public.
4) We must add to the difficulty of accessing this information the fact that oftentimes the different offices involved compete for the same object of regulation, though with different objectives. Consequently, it is not easy—even for DINAMA itself—to access the information in the hands of other State agencies, when the latter know that the information they provide will be used to increase the costs of productive activities that this other institution promotes.
5) Apart from information dissemination and the regulatory jealousy across different offices, it has also been demonstrated that many civil servants have a second job in addition to the one with the State. This is relevant due to two reasons. First, in many cases these civil servants have the knowledge or are capable of generating the information but do not have the time required unless they get an additional incentive. This also explains the poor organization of information. Secondly, the civil servants are frequently working in private activities related to the subject they regulate in the State office. Therefore, in these cases it is not within their own personal interests to provide private information to DINAMA.

In short, the country does not have systematic information in almost all of the items specified above. This is undoubtedly the most relevant obstacle when trying to conduct an economic analysis in the framework of the NIP.

III.1 IS IT RELEVANT WHEN A COST-BENEFIT ANALYSIS CANNOT BE CARRIED OUT IN THE CASE OF THE STOCKHOLM CONVENTION?

As explained before, to conduct a cost-benefit analysis is not a simple task because the information needed is not available and the necessary resources to obtain this information (including the resources to apply the valuation methods described above) are very considerable, and even more so for countries such a Uruguay. In the specific case of NIP, this implies the joint regulation of a significant number of pollutants (PCBs, unintentional emissions of dioxins and furans, pesticides, etc.). This multiplies costs as it implies the collection of all the data described above for each one of the substances. In consequence, the conclusion that no cost-benefit analysis was carried out for the NIP should not come as a surprise.

Nevertheless, one wonders whether it is relevant not to conduct a cost-benefit analysis. The answer is: not much. This analysis is used to determine whether the regulation or programme to be implemented (to reduce the amounts of POPs used) produces net positive benefits, that is, whether it is worthwhile to implement the programme from the economic perspective. It can also be used to estimate to what extent it would be desirable to diminish the use of chemicals, from an economic point of view. This is not the case of the Stockholm Convention. Our country has already ratified the Convention and by this ratification it decided in fact that the total elimination of chemical substances there included will result in enhancing the well-being of the Uruguayan society as a whole. Accordingly, it is not necessary to conduct a cost-benefit analysis. The policy objectives have been set already.

IV. Recommendations for Uruguay to incorporate the Socio-Economic Analysis into its Environmental Policy

Historically, Uruguay has not explicitly taken into account the economic analysis to design its environmental policy. In this sense, the country is lagging behind in comparison with other countries in the region: Chile, Colombia, etc. Given the relevance of the issue, we recommend strengthening DINAMA in the social and economic areas. In order to build the capacity of the institution on these aspects, the following steps are recommended:

1) Provide *DINAMA* with technical experts in the social areas (economists, sociologists, etc.): as stated in item two, DINAMA needs to start handling economic and social information in a permanent and continuous way. It therefore needs full-time staff qualified in these areas. It is not necessary for these technical experts to have specific academic training in the subject (though this would be desirable). A degree such as B.A. in Economics or B.A. in Sociology, etc. would be more than enough (there is no academic training in environmental economics at the graduate level in this country). Thus, when DINAMA works in a concrete field, information will be available. This will even translate into a more efficient use of the resources allocated when hiring technical experts, in the social areas, with more expertise and/or training than those working for DINAMA. (It is recommended, however, that in these cases the latter also receive extra remuneration so as to avoid professional jealousy). If this is avoided, the hired professionals will have in the DINAMA staff of economists and sociologists a more responsive group of interlocutors than they might have nowadays. Likewise, DINAMA would be in a position to have more knowledge of the types of analysis that could be conducted and more certainty in terms of analysis that it needs, to request them to professionals hired for a specific project, thus avoiding the duplication of reports explaining the potential role of economics in the subject in question and therefore making a more efficient use of its resources, derived from external funding sources.

2) *Collect, systematize and generate basic information to conduct economic and social analyses*. In the former paragraph a brief description of the type of information necessary was presented. This information is two-fold: physical information and economic information.

a. In terms of the physical information a distinction is made between existing information and information to be generated.

i. Existing information: this information must be collected and systematized, or at least its sources need to be systematized so it is readily available and accessible to DINAMA. An example of this type of information are the geographic areas where different agri-business outputs are produced and the use of pesticides in these areas. This information can be obtained in DIEA. Another example is represented by information on health and accidents (MSP, School of Medicine, CIAT). In this case it would be necessary to keep a registry of accidents (to create historic files that would allow for a distribution of probabilities to assess risks), diseases, visits to physicians, intake of medicine, etc.

ii. Non-existing information: in this case there is an urgent need to generate this information through studies on the effects of chemical substances to be regulated and the quantification of such effects in different areas of our country. In short, it is necessary to establish the dose-response functions that could indicate the levels of impact on the target to be studied (environment, health or production) given different levels of exposure to

different air, soil or water pollutants. This is key information to assess the costs of pollution according to the methods described in section II.1.2.

b. The necessary economic information can also be divided into existing information and information to be generated.

i. Existing information: the objective is the same as with physical information: to collect and systematize information on existing prices, technical production coefficients, costs, etc., or generated in other State offices or non-governmental organizations. An example of this is represented by input-output matrices prepared by the Central Bank of Uruguay and other agencies that generate information on the economic activity. It is not strictly necessary for DINAMA to generate this information. It would be enough to have trained staff to collect it and generate a database that will be updated and well used.

ii. Non-existing information: the generation of non-existing economic information requires:

- To value things that have no price today, by applying one of the valuation methods previously described.
- To prepare guides on technical production coefficients for the different branches and sub-branches of the economic activity that help estimate regulatory compliance costs.
- To require regulated units to present a report on the costs of production, treatment, etc., in order to estimate the costs of treatment aggregated with the help of econometric techniques.
- To prepare a general balance model that can be computed. This is a powerful tool for the analysis of the economic impact of regulations.

3) To *train the top echelons of DINAMA in basic aspects of environmental economics*: though not essential (insofar as authorities recognize the role of the economic analysis in environmental policy), this would undoubtedly pave the way to integrate this analysis into the design of policies as it would allow for a more fluent dialogue between hired technical experts and DINAMA authorities.

4) *To foster mechanisms for public access to the information*: If national researchers can access (by signing some kind of commitment) existing national information, on many occasions it will not be necessary to allocate resources to conduct research as these activities will be of interest for the researchers. The latter could be asked to provide DINAMA, free of charge, with the final conclusions of their research work and DINAMA will be able to use these results in the formulation of policies. To this end, it is necessary for DINAMA to have the technical experts mentioned in item 1. Otherwise, nobody in DINAMA will be qualified to read the information and the work will be wasted. Of course, this scheme will not always be operative and in some cases DINAMA will have to make public calls for proposals and allocate economic resources to ensure research is conducted.

Finally, it is clear that the former recommendations are applicable not only to the NIP but also to other divisions and departments within DINAMA.

V. Some analyses conducted

V.1 PESTICIDES PROGRAMME

One of the objectives of the pesticides programme was to eliminate the use of 9 organochlorinated pesticides that integrated the “dirty dozen” the Stockholm Convention initially referred to. This objective was met with Decree 375/005 that banned imports, production and use. The other objective of the Pesticides Programme was to conduct economic studies and propose technical studies, analyse the effects of the current legislation and propose changes and policy instruments to reach consensus and grant

priority to other pesticides. In the framework of this second objective, four studies are herewith presented: (1) the estimation of external benefits (positive externalities) resulting from diminishing level of risk in human health and in the environment resulting from a reduction or substitution in the use of pesticides. (2) An economic analysis of the operation of the current Pesticides Registry and (3) a recommendation on economic instruments to manage pesticides.[3]

V.1.1. ESTIMATION OF EXTERNAL BENEFITS (POSITIVE EXTERNALITIES) DUE TO REDUCTIONS IN PESTICIDE EXPOSURE RISKS IN URUGUAY

If the cultivated area is left constant, the following costs and benefits of substituting one pesticide or herbicide for another with lower impact, can be identified:

A) Costs:

a. Higher cost of substitute for the producer. The substitute has been identified as a cost as we assume that a perfect substitute (able to produce the same results) at a lower cost for the farmer, would have been already used by that producer.

b. Higher surveillance costs as a result of banning the use of the original chemical.

B) Benefits:

a. All benefits resulting from a reduction of impact on the environment and human health due to the application of a new pesticide or herbicide.

b. All benefits resulting from larger sales after accessing new markets (with pesticide-free production).

In order to conduct this easy valuation exercise, some basic data are needed:

a) Which are the substitute substances, their application technique, the cost of application technique

b) quantity and value of resources needed to increase control

c) an estimation of external benefits brought about by change and

d) an estimation of additional income that would be generated as a result of accessing new markets.

Item (a) requires a definition of the cases to be studied as in the framework of this report we cannot conduct this analysis for all hazardous pesticides in all their agricultural and non-agricultural applications. Instead, it was decided to carry out some evaluations that might be used as basis for future analyses on alternatives within the framework of the NIP. The substances chosen were glyphosate, endosulfan, cipermetrine and chlorpiriphos. These chemical substances were chosen given their extensive use in the country and their effects on the environment and public health.

Item (b) depends on the instrument chosen to attain the policy objective. This aspect is analysed further below.

Item (c) is analysed below.

tem (d) also requires the choice of a product to be analysed as it is impossible to do the calculation for all agricultural products and all markets. One example is beef given the commercial effect of chlorinated pesticide residue in the fat. However, it is difficult to estimate this with scientific rigour as quotas are negotiated across different markets and, therefore, the commercial result of producing a change of this type in beef production is uncertain. No official information on this matter is available.

As was stated in the corresponding section above, an estimation of this external benefit

3 An attempt was made at estimating the increase in private costs relative to the substitution of hazardous pesticides with other less harmful products in a concrete case: endosulfan in soy beans. This meant to be an estimate of a probable subsidy to an endosulfan substitute. However, these results are not presented as the information collected on substitutes for endosulfan (engeo) and its costs (including application costs) reveal it would be cheaper than endosulfan (maintaining a constant production level). This makes no sense because if so, no farmer would be using endosulfa.

can be obtained through the willingness to pay (WTP) of those affected by the change proposed (in this case, reduced the use of a hazardous pesticides). The collection of this datum through classical methods in environmental economics exceed by far the time frames and budget of this report, except for the transfer of benefits method. As explained in the environmental economics introductory section, the idea behind this method is to use previously estimated WTP relative to a reduction in the use of pesticides, in this case, and transfer them to the case under study with the necessary adjustments so as to take heterogeneities into account.

Previous information on WTP estimates relative to reduction in the use of pesticides is not abundant. Florax et al (2005) report only 27 studies worldwide. These authors use the 27 studies to estimate a meta-analysis function.

On the basis of their study and database, kindly furnished by R. Florax, we chose to carry out two estimations on the Uruguayan WTP relative to a ban on pesticides or herbicides. The first estimate is the result of an average of all values estimated in the past, also providing an estimation of its standard error. The second estimate is produced by adjusting the benefits function estimated in the meta-analysis produced by Florax et al. This second estimate, as previously demonstrated, is expected to be more adjusted given the advantages of this second transfer of benefits method over the first one (using the average).

Estimation of WTP by transfer of average value

The 27 studies on the value of limitations in the use of pesticides result in 331 observations whose statistical descriptions are presented in the following Table. The statistical descriptions do not stem from original values of the studies but were calculated after making them comparable. (See Annex 1).

The total average value of all observations is 129.7 US dollars (year 2000). The distribution is also biased as its mean is 15.7 and its standard deviation is high: 213.

Keeping this in mind, we based our work on the 129.7 average to conduct the first calculation on the Uruguay WTP for a reduced risk in the use of pesticides. Given the 213 standard deviation, a confidence interval of 95% for this mean would be [106.8 - 152.6]. These figures are expressed in US dollars, year 2000. In US dollars year 2005, the average is 146.6 and the confidence interval is [120.7 - 172.6]. This is the Uruguayan WTP in US dollars year 2005. To find the total benefits we must multiply this amount times the total population. Now, what is the total population applicable? In their study, Florax et al are not explicit in this regard; nevertheless, it is correct and conservative at the same time to assume that they refer to the adult population. Children are not part of the surveys and it is a fact that adults with children include the reduction of health risks of their children as well as the environmental quality their children will inherit, when they express their own WTP. Therefore, the correct procedure to find total benefits of the measure would be to multiply the average individual WTP times the adult population (over the age of 18) in Uruguay (2.309.095). This multiplication leads to the final figure of 299.5 million US dollars, with a 95% confidence interval resulting from [278.7 - 398.5].

We shall not engage again in discussing the advantages and disadvantages of transferring a concrete value (in this case an average), though it is evident that the major disadvantage is that the transferred value is not responsive to the differences amongst the studies it comprises and the case where the transferred value is directed to. These differences cannot be controlled, unless by controlling the currency and the time/ value of money.

Table: Statistical descriptions of estimated WTP for a reduction in the use of pesticides.

Type of objective	Average	Mean	Standard dev,
TOTAL (331)	129,7	15,7	213,0
ENVIRONMENT (99)	233,4	233,5	191,5
Aquatic ecosystem (41)	289,3	270,9	188,4
A1 Surface water (15)	237,5	140,6	204,5
A2 Ground water (13)	320,4	321,1	198,6
A3 Aquatic organisms (13)	332,6	329,4	140,7
Terrestrial system (58)	193,8	23,9	185,2
A4 Mammals (15)	240,9	246,5	177,6
A5 Birds (15)	244,9	235,6	183,2
A6 Biodiversity (13)	14,0	13,7	3,8
A7 Beneficial insects (15)	251,6	242,5	189,1
HUMAN (232)	85,4	7,5	206,6
Health effects farmers (46)	262,3	28,8	296,3
B1 Acute effects (13)	299,5	276,1	212,2
B2 Chronic effects (13)	299,4	276,1	212,2
B3 General (20)	214,0	2,0	383,0
Health effects consumers (186)	41,6	5,5	149,2
B4 Acute effects (23)	29,2	2,2	82,8
B5 Chronic effects (23)	97,6	2,6	304,2
B6 Cancer risk (36)	69,4	18,0	193,5
B7 General (104)	22,4	4,7	68,2

Source: Florax et al. (2005).

Estimation of WTP by meta-analysis benefits function

The adjustment of the original Florax et al model (see Annex II for a presentation of the Florax et al study and a more detailed explanation of the process to obtain the estimated value of benefits) forecasts a value of Uruguayan pesos 2.153 that is equivalent to a total of 199 million US dollars, year 2005. But as Florax et al do not report the standard error of the regression, a confidence interval for this value cannot be elaborated. That is the reason why the model was estimated with the same database provided by the authors.

This new exercise reported Uruguayan pesos 1.435 (see Annex II). According to this methodology, this is the figure revealing how much each Uruguayan is willing to pay, annually, on the basis of year 2005 prices, to reduce pesticide exposure risks. With this figure, the benefit (in the form of lower impact on the health of farmers, consumers and the environment) of a programme that seeks the elimination of pesticide use in Uruguay—assuming a current low-risk situation relative to its use—would reach 132 million US dollars a year. The confidence interval of 95% for this estimation is [42 million, 395 million]. Unfortunately, the estimation is not very accurate as the value can be somewhere around 42 and 395 million. Nevertheless, in the current situation no other type of calculation can be made. This is the best that can be done.

The first impression is that the figure is very high. But it is not. For example, the figure includes, as is well known, the benefits derived from a lower exposure to pesticides in fruit and vegetables. The monthly spending in Food and Beverages of the average household in Uruguayan pesos is of Uruguayan $7.268 in Montevideo and Uruguayan $4.876 in urban areas of the provinces (considering Uruguayan pesos in 2005 prices), according to the 1994-1995National Survey on Expenditures and Income of the National Statistics Institute (INE). As the average size of a household is of 3 people according to the 2004 Census by INE, and assuming that 2 of the 3 are adults, the WTP for a reduced risk resulting from exposure to pesticides represents only an additional 1.6% of the annual expenditures in food and beverages in the average household in Montevideo and 2.5% in urban areas in the provinces.

V.1.2. EFFECTS OF THE EXEMPTION OF IMPORT TAXES AND DUTIES ON THE USE OF PESTICIDES

Decree 149/977 sets forth in its first article that "national manufacturers, formulators, importers or distributors" of pesticides will not be able to sell them unless the products are registered and granted due authorization from the MGAP. During the process of registration, the authorities request the submission of information on the chemical characteristics of the product, its

toxicity, application procedure, etc. The Decree also states the exclusive sale of the product under professional authorization. It also regulates its sale to the public in terms of the information that needs to be shared by vendors and included on the products (labels), type of container, etc.

In order to promote registration, the Decree establishes exemption of customs duties and other taxes on imports of the products and their raw materials used in their manufacture.

What are the effects of this Decree?

Decree 149/977 is focused to comply with the vital function of providing the authorities with primary information on the use of pesticides being manufactured in the country. In terms of this objective, the Decree moves in the right direction in so far as it establishes an import duty exemption on products and raw materials and by doing so it creates an incentive to register them: importers that register the product will see their import costs reduced.

However, the exemption has an additional incentive, whether expected or not, which is that of increasing the use of pesticides. The reduction in cost that promotes the registration of the product also reduces the final sales price of the product and therefore raises the demand for it. Consequently, there is a kind of dilemma between the objective of obtaining more information and that of reducing the use of pesticides.

V.1.3. POLICY RECOMMENDATIONS IN PESTICIDE MANAGEMENT

What amendments, if any, must the Decree undergo?

To make a distinction between the objective of acquiring information and the other policy objective to reduce the use of some pesticides, let us first focus on the recommendations to amend the Decree as deemed necessary.

First of all, the Decree is only focused on the vendors. A user who imports the product directly is not compelled to register it. Therefore, it is important that registration is made extensive to final users that import directly as it is an instrument to obtain information on pesticide imports into the country.

In the second place, it is natural to point out that the registry should be under the administration of the Ministry of Housing, Use of the Land and Environment (MVOTMA). Pursuant to the US Federal Insecticides, Fungicides and Rodenticide Act (FIFRA) of 1972, for example, a similar registry is under the responsibility of the EPA. However, this alternative is not taken into account as it is evident that it is not within the objectives of DINAMA for the time being (due to matters of sensitivity in terms of regulatory competence).

In the third place, when evaluating whether to grant authorization or not, the MGAP somehow compares the efficacy of the substance in the production with the risks associated to the application of the product, mainly in terms of the workers' health. Thus, the MGAP has a very important control tool that in a way is very similar to a cost-benefit analysis that seeks a balance between the productive advantages of the substance and the sanitary disadvantages. Even though the final decision is evidently political, and sometimes even short-term aspects have a strong influence, it would be important for DINAMA to identify such authorization process as fundamental and seek the institutional avenue to have some influence so that other aspects—apart from those strictly productive—are taken into account when making this decision. In particular, those relative to the strictly environmental effects. The specific institutional participation of DINAMA in this process will be the result of a negotiation process between the ministries. This result is hard to envisage. Nevertheless, despite the result, it is important for DINAMA to have some incidence in the pesticide authorization mechanism.

In the fourth place, though the exemption poses the problem reducing the final cost of the pesticides, it presents the advantage that it encourages registration. This registration saves the MGAP many resources as, without the exemption, the Ministry would have to go out more frequently to control compliance with this regulation. Even though this is recognized, we understand that the elimination of

the exemption must be given some thought as an alternative. At least in the case of those pesticides that have already been identified as DINAMA policy objectives.

Unlike the regulation or control in the application of pesticides once inside the national territory, which is very costly, the control of pesticide imports by the MGAP is facilitated by the activity of the National Customs Authority. The task of the MGAP would be to make sure that each importer that is registered with the Customs completes the import procedure by registering the product or the input without having to grant him an exemption. This does not seem to be very difficult in the case of formal imports. In such cases, data on the importer are filed by the Customs and it would only require some coordination between this office and the DGSA for the latter to conduct the corresponding control. Apart from higher control costs by MGAP and Customs, the cost of this elimination would also include the loss of net economic benefits for importers as they would be selling less due to rising prices in pesticides and higher import costs. The national agro-chemicals market is calculated in 50 million US dollars (D. Vincent, El País Agropecuario, 2005). Therefore if this alternative needs to be paid for, information on factors that determine demand for each agro-chemical must be obtained and estimated in order to evaluate the price flexibility of this demand and then calculate the economic impact of this measure. At present, the MGAP has public information on imports. In the framework of this report we tried to obtain more information back in time but unsuccessfully. Nor could we obtain accurate information on substitutes.[44] Finally, it is hoped that the State will not incur in any costs for this measure as it is reasonable to expect that higher control costs—if we include Customs capacity—will not exceed the increased collection resulting from the elimination of the registry.

Whether import controls are easy or not, the greatest difficulty for eliminating exemptions set forth in Art. 34 of Decree 149/977 will be the most likely opposition by trade associations involved (Agro-chemicals Chamber, Rural Association, etc.). It would be advisable to suggest negotiating an alternative to the removal of exemptions on pesticides that have already been identified as DINAMA policy objectives. The relative increase in the prices of these pesticides, due to the elimination of import exemptions, would facilitate the work of DINAMA (relative to pesticide use abatement) as pesticides would now have relatively higher prices compared to other substitutes (presumably less harmful, whose use is encouraged). This measure can be complemented with others that will be introduced shortly.

What policy instruments (additional) would be necessary to reduce the use of pesticides that become the subject of policy?

Apart from eliminating exemptions on pesticides DINAMA is aiming at, two additional regulatory alternatives are suggested for consideration:

- *To subsidise pesticides or substitute technical alternatives*: this instrument is a complement of the exemptions removal in the case of pesticides identified by DINAMA, as it reinforces their incentive by further lowering the price of substitutes in relative terms. Depending on the availability of public funds the subsidy could completely help tip the scale from the economic standpoint (that is, it could cover any difference in costs between the pesticide whose use is to be eliminated and the one whose use is to be encouraged). The same instrument would apply to reduce the price of production alternatives that do not employ pesticides and are being promoted.
- *Negotiable import quotas*: this measure tends to set up a maximum limit of pesticide application within a country, and that can be considered without making too many amendments to the national legislation, as Art. 33 of Decree 149/977 states that "The registration and sales authorization of the products mentioned ... can be transferred from one company to another as long as the registration is in force." This alternative poses several problems. First, as pesticides become more expensive their implementation will presumably require a tough political negotiation. Secondly, this will encourage contraband so Customs controls must be tightened.

4 See previous footnote.

An important final comment: all these policy recommendations mentioned in former paragraphs focus on imports and trade of pesticides but do not point specifically to the direct control of their use. The reason for this is that information is primary. Authorities get information only in relation to how much is imported and sold but not on how much is finally used. With the purpose of improving this aspect, it is suggested that DINAMA coordinate the generation of this information with offices such as the DIEA of the MGAP. DINAMA itself can estimate this information with much accuracy using the information on crops, as the necessary application doses are known, despite the fact that these may vary from farmer to farmer.

Lastly, DINAMA should promote an effective application of a civil responsibility system on the effects of pesticides.

V.2 MANAGING PCB-RELATED EQUIPMENT

V.2.1 Policy Measures

Policy objective: To eliminate the use of PCB by 2025 (from the Stockholm Convention)
This policy objective is already set so it is unnecessary to conduct a cost-benefit analysis on it. What needs to be done is comply with it in the less expensive way possible for the country. Given the high costs of collecting and analysing all existing equipment, plus the lack of resources to do so on the part of DINAMA, a strategy that could help reach the objective by minimizing costs should be based on the following:

1. Ban inflow of PCB-related equipment
2. Ban inflow of oils containing PCB
3. Ban the manufacture of equipment containing PCB
4. Make it obligatory for UTE to replace and export (or at least to dispose of adequately) all its PCB-containing equipments in the medium-term. As UTE already has a plan in this respect, DINAMA only has to coordinate joint efforts with this power utility.
5. Information on the incineration costs at the Central Batlle (power generation plant run by UTE) should be obtained and then compared to export costs; the latter should then incorporate the economic value of hazards (negative externalities)--if any—of both alternatives. To eliminate (destroy) oil and contaminated equipment in the less costly way (by exporting them, by incinerating them at the Central Batlle, by long-term storage in some adequate place).
6. To subsidise private companies to replace equipment. Subsidy alternatives should be studied (percentages, rates). Any amount of money will represent costs for the business concerns and they will be reluctant to spending that money.

In relation to the PCB Report prepared by the NIP technical team, the conclusion is to control the following:

1. The national manufacture of condensers: it is not safe, more information is needed on the Amper company.
2. Importation of equipment from Argentina and Brazil: it is not safe, there is a gap in information. There may be equipment with and without PCB. UTE accounts for 95% of these imports.
3. Equipment installation, maintenance and withdrawal activities: Imported oil is PCB-free but there is re-utilization of contaminated oil. There are 93 companies (the largest) involved. These companies are authorized by UTE.
4. UTE: this is a key actor. It owns 95% of the equipment existing in the country. The total number is estimated in 36,000 accounting for 137 tons. In the case of UTE, as mentioned before, coordination with this power utility must be strengthened in terms of:
   a. Maintenance: control that the UTE plan is still being applied
   b. Elimination of contaminated equipment: collect information on the 36,000 units of equipment

5. Final destination of used oils: Urge Mym not to throw away obsolete oil into tanks. Prohibit the re-utilization of used oil to Parteluz and Specialized Maintenance.

V.2.2 Technological alternatives to decontamination, destruction or final disposal of PCBs

DINAMA has identified alternatives that are likely to be implemented in terms of decontamination, destruction or final disposal of PCB. The next table presents a detail of costs per unit of treated oil in some of these alternatives. This information will serve as basis for other more reliable data on the distribution of PCB concentrations in existing equipment throughout the country.

COST OF TREATMENT ACCORDING TO CONCENTRATION

Treatment alterna-tives	Oil concentration	Treatment	Cost of treatment:			Oil refilling necessary	Cost of oil refilling/ton equip.	Transform-er refilling necessary	Cost of refilling US$/250 kVA	Cost of treatment +refilling/ 250kVA	Cost of treatment +refilling/ 500kVA	Cost of treatment +refilling/ 1000kVA
			Oil US$/ton	Trans-former US$/ metal ton	US$ to-tal/ton of equip.							
A1	50 -500 ppm	Dechlorination <2 ppm	2500	0	800	NO	0	NO	0	800	1600	3200
A2	50 -500 ppm	Dechlorination < 50 ppm	1200	0	384	NO	0	NO	0	384	768	1536
B1	500 - 5000 ppm	Dechlorination <2 ppm	2500	0	800	NO	0	NO	0	800	1600	3200
B2	500 - 5000 ppm	Dechlorination < 50 ppm	1350	0	432	NO	0	NO	0	432	864	1728
A3	50 - 500 ppm	Co-incineration at CUCPSA	1148		367,2	Yes	320	NO	0	687,2	1374,4	2748,8
A4	50 -500 ppm	Alternative fuel Batlle thermoelectric station				Yes	320	NO	0	320	640	1280
A4	50 - 500 ppm	Incineration in Europe (including freight and insurance)	3000	3500	3340	Yes	320	Yes	5000	8660	14020	24640
B3	500 - 5000 ppm	Incineration in Europe (including freight and insurance)	3000	3500	3340	NO	0	Yes	5000	8340	13380	23360
C	> 5000 ppm	Incineration in Europe (including freight and insurance)	3000	3500	3340	NO	0	Yes	5000	8340	13380	23360

Oil weight/total weight = 32%

250 kvA weighs 1 ton (oil + equipment)

1 ton equipment equivalent to 0.32 ton oil

cost of co-incineration in CUCPSA reported = 15% below cost of dechlorination

Source: Eng. Rosario Lucas, DINAMA

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ANNEX I

To compare the WTP estimated for the different studies undertaken was to use values estimated in the course of several years and different countries (though the majority represent the USA) to a common measurement unit, in the same currency and according to the prices in a given year. To carry all estimates to a common measurement unit we need to calculate a standardized T value, where the original reported value and T represent the marginal WTP per person per year for reductions in pesticide risk exposure , in US dollars, year 2000. The sub-index refers to three measurement units: (1) per every household, for a period of time, (2) per unit of the final product, and (3) per pesticide application, per acre of treated crop. The mi are transformation factors defined as:

a) m1 = d/h, where h is the average size of a household in a given country and year, and d is a conversion factor for a period of time determined on an annual basis;
b) m2 = c/w, where c is the average per capita consumption of the final product per year, and w a weight conversion factor going from the original weight units to the measurement unit of c, and
c) m3 = s/r, where s is the average number of pesticide applications for the crop in question, and r is the rural population density in the country under study.

The t conversion factor is the GDP deflator for the country in question and for this reason the original values are transferred to prices in the year 2000. Finally, the conversion of local currencies into US dollars (year 2000) is done by applying the year 2000 Purchasing Power Parity, calculated by the World Bank.

Observations are classified according to the valuation objective into two main categories: Those relative to monetary values for reductions in pesticide use given their positive impact on the environment and their impact on human health. Both categories, in turn, are divided

into sub-categories. The first one corresponds to those that focus on aquatic ecosystems (41 observations) and terrestrial ecosystems (58). Those that focus around aquatic ecosystems are further divided according to what was valued: either the improvement in the quality of surface water (15 observations), ground water (13 observations), and aquatic organisms (13 observations). Observations on WTP for improved quality in terrestrial ecosystems were classified into valuation of mammals (15), birds (15), biodiversity in general (13) and beneficial insects (15). Values on WTP for reductions in human illness-related risks were classified into values resulting from enhanced farmers and agricultural workers' health (46 observations) and values resulting from positive impact on consumers' health (those who consume the crops whose production employs pesticides) (186). The last two categories, in turn, are divided according to their type of impact on health: acute effects on health, chronic effects on health, general effects on health, and in the case of consumers, cancer risks.

The majority of the studies conducted value the reductions in pesticide use through a reduced impact on human health this would generate (232 estimated values) and more specifically, on the effects on consumers health (186 values) (this bibliography is motivated for reasons relative to food security), while a significantly lower amount (99 estimated values) were aimed at valuing the enhancement of environmental quality resulting from a reduced use of pesticides.

In terms of values, it is interesting to point out that average WTP values for enhancements in the different sub-categories in terrestrial and aquatic ecosystems, as well as on the health of farmers, are very similar, except for the WTP for biodiversity, which is of a different magnitude. The same is true for the WTP for effects in consumers' health, whose values are lower though its distribution is very biased, with a mean of 5.5 and a standard deviation of 149.2 (see Florax et al., 2005).

ANNEX II

Florax et al. present 4 statistical regressions in their Table 3. The 4 regressions are specified with fixed effects for the different studies. The studies attempt to estimate the WTP for reductions of risks associated to the use of one or more pesticides, but they focus on different materializations of this risk. Some focus on the effect of pesticides on farmers' health, other on the consumers' health (the majority), other on the environmental impact on the aquatic ecosystems and, finally, others on the environmental impact on terrestrial ecosystems. In the first regression (Model (1) General) in the following Table, that reproduces Table 3 by Florax et al) the authors do not control by the different valuation objectives they used in the original studies. In the second regression ((2) Specific) of the second column, the authors repeat the estimation of the "General" model but eliminating the variables that were not statistically significant in the first regression. Finally, in columns 3 and 4, the authors add dummy variables for the valuation objectives of their different works. In column 3 ((3) Incl. Targets Model) the authors add dummy variables in the case of those studies whose subject of valuation was farmers' health and other two for those cases where the subject of valuation were the aquatic and terrestrial ecosystems, respectively. The consumers' health category is omitted.

In Model (4) "Incl. Target types", the authors classify the same studies into more specific categories.

Table: Florax et al (2005) (a) Estimation of meta-analysis function results

Variable	(1) General	(2) Specific	(3) Incl. Target	(4) Incl. Target types
Constant	2,2 (0,22)	7,87*** (2,62)	4,31 (0,38)	2,85 (0,23)
Objectives and types of objectives				
Farmers			0,96 (0,29)	
Acute effects				0,42 (0,12)
Chronic effects				0,42 (0,12)
General				0,73 (0,21)
Consumers			Omitido	
Acute effects				-0,06 (-0,04)
Chronic effects				0,18 (0,12)
Cancer risk				-0,15 (-0,40)
Generales				Omitido
Aquatic ecosystem			1,21 (0,37)	
Surface water				0,63 (0,18)
Ground water				0,68 (0,20)
Aquatic organisms				0,56 (0,16)
Terrestrial ecosystems			1,17 (0,36)	
Mammals				0,54 (0,16)
Birds				0,55 (0,16)
Biodiversity				2,39 (0,69)
Beneficial insects				0,56 (0,16)
Initial level of risk and income				
Medium risk	2* (1.66)	0,13** (2,06)	0,14** (2.19)	0,17*** (2,76)
High risk	0,82*** (12.49)	0,82*** (12,62)	0,81*** (12,77)	0,78*** (12,58)
Log (GDP)	0,58 (0,71)	0,11 (0,44)	0,38 (0,43)	0,51 (0,54)
Geographic location				
Non-USA	1,95 (0,75)			
Method				
Selected experiments	-3,7** (-2,26)	-4,50*** (-6,40)	-4,77*** (-4,48)	-5,05*** (-4,25)
Revealed preferences	-7,32*** (-3,46)	-8,13*** (-11,49)	-7,52*** (-3,42)	-7,4*** (-3,46)
Type of survey and sampling				
Consumers answer	-0,05 (-0,05)			
Individual survey	5,54 (1,61)	5,88*** (14,68)	6,06*** (9,03)	6,23 (8,03)
Previous test	-0,16 (-1,17)			
Bias control	-0,17*(-3,04)	-0,19*** (-3,35)	-0,19*** (-3,42)	-0,18*** (-3,50)
Perception of risk				
Potential scenario	1,44 (0,29)			
General risk	-0,23 (-0,16)			
Payment instrument				
Over-price	-8,54*** (-2,81)	-8,27*** (-12,17)	-7,57*** (-3,32)	-7,4*** (-3,07)
Separate invoice	-4,76** (-2,26)	-3,19*** (-23,99)	-3,16*** (-19,02)	-3,15*** (-18,75)

Type of control mechanism				
Integrated pest management	-2,75* (-1,70)	-3,31*** (-4,80)	-3,7*** (-3,10)	-2,94* (-1,92)
Ban on pesticides	0,66 (0,33)	1,17*** (4,50)	1,24*** (3,64)	1,42*** (2,79)
Health risk vehicle				
All fruits and vegetables	5,46*** (2,82)	6,52*** (9,28)	6,84*** (5,73)	7,29*** (4,91)
Source of risk				
One pesticide	0,47 (0,32)			
N	316	316	316	316
R2-adjusted	0,92	0,92	0,93	0,93
Log-likelihood	-555,48	-556,64	-548,63	-531,66
LR-test [b]	2,32		16,02***	49,96***
F-test	213,33***	323,88***	270,93***	176,26***

a) Minimal weighed squares. Weightings are determined as the number of observations in the corresponding studies that were used to determine the risk value. The statistical significance is indicated with ***, ** and* for levels 1, 5 and 10%, respectively, with the statistical t in parenthesis.

b) LR-test of the restricted model in column (s) against models (1), (3) and (4).

Source: Florax, et al. (2005)

It is important to highlight that none of the dummy variables relative to the different types of valuation objectives was significant. This is most probably due to the presence of multiple co-linearity across the variables which does not allow to identify these differences correctly. Therefore, it was decided to use model (2) in order to obtain the estimated WTP.

The first column in the next Table shows the set of variables used to make the calculation after eliminating the non-significant variables. The second column shows the estimated coefficient for each variable. The third column shows the adapted value. This is the value given to the variable in question to adjust the econometric model and obtain an estimation of the WTP.

Table: Results of adapting the original benefits function of the meta-analysis in the case of NIP

Variable	Coefficient	Value	WTP (Incremental)
Constant	7,87	1	7,87
Initial level of risk and income			
Medium risk	0,13	0	0
High risk	0,82	0	0
Log (GDP)	0,11	5,03	0,6
Method			
Selected experiments	-4,5	0,20	-0,9
Revealed preferences	-8,13	0,40	-3,3
Type of surveys and sampling			
Consumers answer			
Individual survey	5,88	0,14	0,8
Previous test			
Bias control	-0,19	0,27	-0,1
Payment instrument			
Over-price	-8,27	0,19	-1,6
Separate invoice	-3,19	0,17	-0,5
Type of control mechanism			
Integrated pest management	-3,31	0	0,0
Ban on pesticides	1,17	1	1,2
Health risk vehicle			
All fruits and vegetables	6,52	0,034	0,3
		LOG WTP)	**4,3**
		WTP	**76,2**
		Total WTP in 2005 US $	**86,2**
		Total WTP in 2005 Uruguayan $	**2153,8**

To proceed with the calculation the current situation was classified as a low risk one in what was meant to be a conservative exercise. The adapted Uruguayan GDP value was expressed in the same units as in the original study. It corresponds to the level of the per capita GDP of the year 2000 in dollars, and the World Bank (World Development Indicators, 2002) purchasing power parity index was used for its calculation. The values adapted for the variables that control under the original studies estimation method, the type of survey and sampling (in those works based on the Contingent Valuation Method), and the payment instrument, are the average of such variables in the sample. Regarding the type of control mechanism, as the NIP refers to the prohibition of certain pesticides, the variable "ban on pesticides" takes value 1 while the integrated management of pests takes value 0. Finally, as we tried to obtain an "average" value of the Uruguayans' WTP for reductions in pesticide risk exposure, its average value was set for the variable "all fruits and vegetables", as the variables omitted here are: a fruit or vegetable (crop) in particular, labour health and environmental quality.

In order to get a confidence interval the model had to be estimated once again as the authors did not report the standard error of the regression. Using the database kindly provided by R. Florax, a model slightly different from the original was run as the original results could not be replicated. This model was a Generalized Minimal Squares, that allowed for heterogeneity across different studies.

Results are reported in the following Table.

Table: Results of adapting the original benefits function of the meta-analysis in the case of NIP

Variable	Coefficient	Adapted Value	WTP (incremental)
Constant	7,1	1	7,1
Initial level of risk and income			
Medium risk	0,25	0	0
High risk	0,77	0	0
Log (GDP)	0,07	5,03	0,4
Method			
Selected experiment	-3,44	0,20	-0,7
Revealed preferences	-6,96	0,40	-2,8
Type of survey and sampling			
Consumers respond			
Individual survey	4,33	0,14	0,6
Previous test			
Bias control	-0,2	0,27	-0,1
Payment instrument			
Over-price	-6,84	0,19	-1,3
Separate invoice	-3,2	0,17	-0,5
Type of control mechanism			
Integrated pest management	-2,18	0	0,0
Ban on pesticides	1,05	1	1,1
Health risk vehicle			
All fruits and vegetables	5,19	0,04	0,2
		LOG(WTP)	**3,9**
		WTP	**50,7**
		Total WTP in 2005 US $	**57,4**
		Total WTP in 2005 Uruguayan $	**1434,5**

Acronyms

ANEP	National Public Education Board
ANONG	National NGO Association
ANP	National Port Authority
ANTEL	National Telecommunications Utility
ARU	Rural Association of Uruguay
AUSE	Uruguayan Food Security Agency
BCU	Central Bank of Uruguay
CAMAGRO	Agro-Chemicals Chamber of Commerce
CAS	Chemical Abstracts System
CIU	Uruguayan Chamber of Industries
CODICEN	Central Board of Directors, MEC
COTAMA	Technical Advisory Commission for the Protection of the Environment, DINAMA, MVOTMA
DGSA	General Directorate for Agricultural Services, MGAP
DGSG	General Directorate for Livestock Services, MGAP
DIEA	Agricultural Economic Information Directorate, MGAP
DILAVE	Veterinary Laboratories Division, DGSG, MGAP
DINAMA	National Directorate for the Environment, MVOTMA
DNA	National Customs Authority, MEF
DNB	National Fire Brigade, MI
ECOPLATA	Integrated Uruguayan River Plate Coastal Zone Management Support Programme
EEC	European Economic Community
EPA	Environmental Protection Agency, United States
EU	European Union
FAGRO	School of Agronomy, UdelaR
FAO	United Nations Food and Agriculture Organization
FCI	International Cooperation Fund
FREPLATA	Environmental Protection Project for the River Plate and its Maritime Front: Prevention and Control of Contamination and Restoration of Habitats
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHS	United Nations Globally Harmonized System for classification and labelling of chemicals
GTZ	German Cooperation Agency
ILO	International Labour Organizatio
IM	Local Governments in Uruguay
IFM	International Monetary Fund
IMM	Municipality of Montevideo, Uruguay
INE	National Statistics Institute
INIA	National Agriculture and Livestock Research Institute
IOMC	Inter-Organization Programme for the Sound Management of Chemicals
LATU	Technological Laboratory of Uruguay
MDN	Ministry of National Defence
MEC	Ministry of Education and Culture
MEF	Ministry of Economy and Finance
MERCOSUR	Southern Common Market
MGAP	Ministry of Livestock, Agriculture and Fisheries
MIDES	Ministry of Social Development
MIEM	Ministry of Industry, Energy and Mining
MRE	Ministry of Foreign Affairs
MSP	Ministry of Public Health
MTSS	Ministry of Labour and Social Security
MVOTMA	Ministry of Housing, Use of the Land and Environment
NGO	Non-governmental Organization
NIP	National Implementation Plan for the Stockholm Convention
PAHO	Pan-American Health Organization
PIAI	Irregular Settlements Integration Programme
PIT-CNT	Workers Trade Unions Federation
PNN	National Coastguard Authority
PPR	Responsible Production Project
PROBIDES	Programme on the Preservation of Biodiversity and Sustainable Development in the Eastern Wetlands
RAPAL	Latin-American Network on Pesticides and Alternatives Action
RBN	National Food-Science Regulations
REDES-AT	Social Ecology Network - Friends of the Earth
RETEMA	Thematic Environmental Network
SADI	Industrial Sewage Authorization Request
SPC	Potentially Contaminated Site
UdelaR	University of the Republic of Uruguay
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNITAR	United Nations Institute for Training and Research
UTE	National Power Generation and Electrical Transmissions Administration
UTU	Labour University of Uruguay (Polytechnic School), MEC
WB	World Bank
WHO	World Health Organization

Abbreviations

BAT	Best Available Technologies
BEP	Best Environmental Practices
CIF	Cost, insurance and freight
DDE	Dichlorodiphenyl dichloroethylene
EIA	Environmental Impact Assessment
FOB	Free on board
g	Gram
DDT	Dichlorodiphenyl trichloroethane
DIA	Daily intake allowed
GHS	Globally Harmonized System
GWh	Giga Watt hour
Ha	Hectare
HCB	Hexachlorobenzene
HDI	Human Development Index
Hl	Hectolitre
Kg	Kilogram
km2	Square kilometre
ktep	1000 petroleum equivalent ton
KWh	Kilo Watt hour
LD	Lethal Dose
LMR/MRL	Maximum Residue Level
m	Metre
m3	Cubic metre
MSDS	Material Safety Data Sheet
MW	Mega Watt
ng	Nanogram
OEL	Occupational exposure limit
PCB	Polychlorinated biphenyl
PCDD	Polychlorinated dibenzo-p-dioxins
PCDF	Dibenzo Furanos Poli Clorados
PET	Polyethylene terephthalate
pg	Picogram
POPs	Persistent Organic Pollutants
ppb	Parts per billion
ppm	Parts per million
PVC	Polyvinyl chloride
t	Metric tons
TEF	Toxicity equivalent factor
TEP	Petrol equivalent tons
TEQ	Toxic equivalent
TOC	Total organic carbon
USD	United States dollar