



NATIONAL IMPLEMENTATION UNDER THE STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS

PARAGUAY 2007

FOREWORD

The present document called “National Implementation Plan of the Stockholm Convention for Paraguay” constitute a fundamental step in the fulfillment of the assumed commitments for our country in the frame of the Stockholm Convention about Persistent Organic Pollutants, international instrument that has as main objective the environment and human health protection against this group of chemical substances.

The Convention was signed by Paraguay in May, 2001 and was ratified by the Law 2.333 of January 6th, 2004. It got into force on May 17th, 2004 and at the moment of the publication of this document, 146 countries are parties of this international instrument.

With a strong commitment and presence in the international and national arena in relation to Chemicals, in January, 2005 our country started the elaboration process of the National Plan, which ends and consolidates in the current document. In this Plan the national actions are contemplated and agreed for the persistent organic pollutants management into the chemicals management framework during their lifecycle and the national environmental policy.

During the preparation process of the plan, the national capacity was strengthened in knowledge about the situation in the country, problems associated were identified and solved and new processes of inter-institutional coordination began, engaging all sectors of society. The Plan reflects the decision making activity, the building up of national capacities, the work planning, and the commitments adopted by the various institutions, axes of implementation.

The “National Implementation Plan for the Stockholm Convention” is a document that establishes the activities to be performed in order to fulfill the requirements of the mentioned Convention and it is dynamic and of flexible application. It is in the framework that our country is assuming its revision and periodical updating based on the national necessities and priorities, as well as on the new decisions of the Parties Conference.

The Secretary of Environment confirms through this document its commitment to convene and work in a coordinated and subsidized way with all the actors and parties who are needed for the implementation, as well as future revisions and modifications of this document, taking into account the national circumstances and the necessary resources to carry on the activities contemplated in this Plan.

It is, therefore, very grateful to endorse this document, which is part of the activities that the Technical Cooperation through UNEP, offered to SEAM for the elaboration of the National Implementation, and has contributed for obtaining indispensable data for the analysis or situation of POPs in Paraguay, which are presented in this report to allow the technicians’ awareness and the strengthening of the NPC.

The United Nations Environmental Project (UNEP) and the Global Environment Facility (GEF) has performed a very important role as financial support along the whole process, allowing the determination and definition of national priority areas and to identify the cross axes that interact with the POPs management, having as final goal the protection of the environment and the improvement of life quality.

Strategic Planning Department

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EXECUTIVE SUMMARY

The Stockholm Convention on Persistent Organic Pollutants (POPs), is an international instrument, legally binding, directed to the reduction and further disposal of such substances by the signatory countries, with the objective of protecting the environment and the human health against the POPs.

By Persistent Organic Pollutants are known a group of substances or families of chlorinate organic substances, that present in a combined way characteristics of toxicity, persistence, bio-accumulation and capacity for transporting themselves long distances from where they were emitted or used. The first organic pollutants subject to the Convention include those know as “The dirty dozen”, which include 9 fertilizers (Aldrin, Chlordane, DDT, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene (HCB), Mirex, Toxaphene); Polychlorinated Biphenyls (PCBs); and the unintentionally formed by-products (Dioxins and Furans).

This Convention was signed by Paraguay in May 2001, ratified by Law 2333 on January 6th, 2004 and get into force on May 17th same year. With the purpose of fulfill with the Stockholm Convention, SEAM has coordinated the formulation of the “National Implementation Plan (NIP) for the Stockholm Convention about Persistent Organic Pollutants”, with the United Nations Environmental Program (UNEP) and the financial support of the Global Environment Funds (GEF).

The preparation of the PNI began in 2006 and implied the participation of different organizations of public interest, governmental as well as non-governmental, and also the recruiting of national and international professionals for the development of studies, evaluations and activities in different points of the national territory.

In this way, the set of measures and proposed actions in the NIP is the result of the participative process, where it is pretended to strengthen the country in association with POPs management through the coordinated inter-institutional processes that guarantee a better quality of environmental, economically and socially sustainable, fair and participative life to present and future generations.

In a first stage, the coordination mechanism was established through the creation and strengthening of the Unit Project Coordinator (UPC) and the formation of the National Project Coordinator (NPC) integrated by Organizations of the private and public sector and NGOs.

Later, in a second stage, pertinent studies were performed in order to evaluate the national situation with respect to POPs and obtain in this way the bottom line for the definition of priorities for the country

The Inventory updating of Dioxins and Furans releases until 2005 reflected, like in 2003, an inappropriate management associated to uncontrolled burning processes and wastes incineration; out of a total of 257 g EQT/year, 123 g EQT/year corresponds to the uncontrolled combustion process and 67 g EQT/year to the wastes incineration, mainly those medical ones. For the calculation of emissions the “Normative Instrument for Identification and Quantification of Dioxins and Furans Releases” published by UNEP – Chemicals, was taken as basis.

On the other side, the National Inventory of POP Pesticides was based on a monitoring of Obsolete Pesticides Inventory performed by SENAVE with the support of FAO; even in a parallel way an evaluation of the Management of Pesticides was carried on in our country, covering all aspects of the lifecycle of these products through consultations to the governmental institutions and related NGOs. The Project SENAVE-FAO inventoried 20 liters of Endrin and 6 kg of HCB and 320 Kg of Chlordane, even though the contaminated material with the last reaches 20 tons approximately.

For the identification of existences of PCB in the country, the Project focused in applications of close systems type (Electric transformers and capacitors), and it was counted on an important participation of the energy sector, mainly on ANDE and the Bi-national Entity Itaipú. The industrial sector had a lower participation, even though at the end stage of the PNI a higher participation took place. The inventoried amounts correspond to preliminary figures, where the amount of oil with suspicious content of PCB reaches 115.000 liters and the contaminated material added to phased-out equipments totalize 48 tons. Nevertheless, the evaluation that accompanied the preparation process of the inventory raises certain worries in reference to the previous and current management of this pollutant and actions on this respect have started to minimize the risks associate to it.

Potential Contaminated Sites were also identified with POPs, where were evaluated the following: the IAN warehouse in Caacupé, the OFAT warehouse in Asunción, the Acaray Energy Plant in Hernandarias, the PCB interim warehouse of ANDE in San Lorenzo, the support station of Itaipú Binacional (right river side) and the former PCB warehouse of said entity on the left river side, as well as the open air spillway and places where medical wastes are incinerated.

The national capacities for the POPs management were also evaluated, in order to determine the weaknesses of the country and therefore be able to decide which action to be taken for its strengthening. In this context some failures and blanks in the legal and technical aspects were identified and it is considered therefore necessary to apply immediate measures to achieve the success of the current Plan implementation.

Following all the mentioned studies and as part of a strategy of awareness and diffusion to the population and decision makers, different activities in the national territory took place which consisted mainly in Workshops and Courses addressed to different sectors of the population with the objective to inform about POPs, the Stockholm Contention, the elaboration of the PNI and its progress. Through these activities, the knowledge level and the areas of worry of the population were able to detect as well as the factors which constituted also the basis for the determination in a third stage, of the national Priorities and Objectives.

In this way and due to Workshops with the NPC the national Objectives and the priority action lines were defined:

General Objective: to adopt appropriate Management measures to eliminate and/or reduce the POPs in Paraguay, in order to protect the human health and the environment.

Specific Objectives:

- To develop and strengthen the national capacities required to implement a suitable Management of POPs
- To reduce the emissions of Dioxins and Furans in the sources of greater incidence as a result of the National Inventory through economically feasible and socially acceptable measures.
- To identify and eliminate the stock of Polychlorinated Biphenyls at a national level through an environmentally adequate management of them.
- To generate the adequate sanitary and environmental conditions for the final disposal of obsolete POP pesticides.
- To identify and repair the Contaminated Sites with POPs.
- To develop an effective and continuous strategy of information, awareness and formation to the citizenship about POPs and the Stockholm Convention.

Priority Action Lines:

- Strengthening of national capacities for the POPs management.
- Environmentally adequate management of the Urban Solid Wastes and Medical Wastes.
- Finalization of the PCB National Inventory and Final Disposal of the identified stocks.
- Adequate Environmentally Management of Obsolete POP Pesticides
- Information and continuous and affective Awareness to and of the Paraguayan population

The proposed actions for each of the established priority line, are focused on the development and implementation of measures that allow the country honor the Objectives of the Stockholm Convention and the continuous evaluation of the advances, being the estimated implementation cost of USD 5.650.000

Paraguay, being the signatory country of the Stockholm Convention, and through the approval and ratification of the same by National Law, is committed through this National Plan to adopt the suggested measures to assure the final disposition and/or reduction of the POPs.

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1 Introduction

Persistent Organic Compounds

The POP are organic components (which are constituted by carbon) produced by human activities (anthropogenic), and because their physical and chemical properties (particularly its content of chlorine) use to be resistant to degradation by light (photolytic), chemical and biological, therefore they are able to persist/lat for year in the environment and in the tissues of the organisms exposed to them bio-accumulating.

Its high solubility in lipids favors its penetration through the membranes of the human beings cells and the aquatic and terrestrial biota organisms, as well as its accumulation in fat tissues, that why they are likely to be found in different stages of the food chain (phenomenon of bio-magnification).

Due to its capacity of bio-accumulation and of lasting for long periods inside the living organisms, these substances are able to produce a set of adverse effects in different organs and systems including the hormonal, and to raise the risk of pathologic processes development (including cancer and reproductive alterations). Children and women are a group especially vulnerable to the harmful effects)

The first organic pollutants related to the Convention include those known as “the dirty dozen”, which include a group of commercial products (among them several pesticides and polychlorinated biphenyls are considered) as well as the accidental by-products of different processes included in the Annexes A, B and C of the Convention

The pesticides considered POPs, like the Polychlorinated Biphenyl (PCB), are products of synthesis, manufactured and introduced to the international trading by chemical industries of developed countries. As the adverse effects on different animal species and the risks deriving from its exposition to human beings started being known, their utilization have been prohibited, but not their manufacturing and export so during certain time they continued being commercialized in developing countries.

Contrary to what was expected, the prohibition did not foster the disappearance of the presence of these pollutants in the different environmental components (air, water, soil, biota) of the exporting countries of the POP products, that it was related with their capacity to move far away from the countries that continue consuming them. From that derives the necessity to adopt measures agreed among the developed and the developing countries, in order to suspend definitively its introduction to the market and, above all, to the environment, applying the common responsibility by differentiating from producers, importers, exporters, traders, consumers and governmental authorities.

Two additional facts call the attention when they are considered in the Convention’s text. The first one in related to the benefit in the application of DDT for the control of the malaria transmission by the vector insect, not only because the effectiveness of the product, but also due to its persistence and low cost (once it lost the patent). This last advantage made it particularly accessible for the developing countries due to the public health problem they have and the lack of enough resources to substitute it by other pesticide less hazardous but with a higher price in its application. The second relevant fact is that the Polychlorinated Biphenyls (used as dielectric oils in transformers and

capacitors until the early years of the 80s), showed certain advantages related –among others – that they retain their properties during many years.

The Stockholm Convention

The Stockholm Convention on Persistent Organic Pollutants (POP) is an international tool that has as a main objective the protection of the environment and the human health against this group of chemical substances.

This Convention was signed by Paraguay in May 2001, ratified by the Law 2333 on January 2004 and got in force on May 17th, that same year.

The Convention has recognized that the POPs have toxic effects, bring health problems, especially in the developing countries. They are conscious of taking worldwide measures about POP, and also of remembering the pertinent dispositions of the declaration of Rio about the Environment, Development and the Program 21st. and recognize that the idea on the precaution is the foundation of all parties and they are conscious of adopting measures to prevent adverse effects caused by the persistent organic pollutants. They also recognize the importance of conceiving and employing alternative processes and other chemical substitutes, environmentally rational for the protection of the human health and the environment from the harmful effects of these 12 pollutants.

In relation to POP pesticides listed in Annex A Part I, cases where a scientific exemption can be applied are mentioned. It is important to make people note that Paraguay did not request for any exemption in respect to these products or in cases related to DDT or PCBs.

The potential accidental generation sources of the POPs subjected to the Stockholm Convention are mentioned in Annex C, Parts II and III, and include processes which involve the combustion of urban and hazardous solid wastes, as well as biomass burning; thermal processes apply in the metallurgic industry, and manufacturing processes of cellulose and paper that employ basic chlorine or certain chemical substances which contain chlorine, among others.

The Convention establishes that countries should promote the adoption of the best available techniques and the best environmental practices in the activities referred in Annex C, Parts II and III, in order to eliminate or reduce the POP non-intentional release to the environment, as it is mentioned in the Articles 5 and 6. Nevertheless, it also foresees that when a potential accidental source of POP included in Annex C, Part III, results in a considerable release source in a country, this will be able to confer it a superior priority level, and if it is the case, to subject the new projects to the adoption of the best available techniques to prevent such emissions, and also promote the use of the best environmental practices, as it is required to happen with the new sources projects of Part II.

In the Article 5 of the Convention, it is posted special emphasis in giving priority to the adoption of useful measures to avoid the formation or release of non-intentional POPs such as Dioxins and Furans, for that it is proposed to resort to technologies that produce a little waste; to foster the reutilization and recycle of wastes or substances generated

and used in these processes, when corresponds. This consideration has taken to keep in mind the issue of alternatives in said guides, an area that demands the development of researching for its strengthening. At national level, these aspects have been foreseen with the broadcasting of the Master Plan of Integral Management of Municipal Solid Wastes.

It is of particular interest for Paraguay what is disposed in Incise f) of Annex C Part V in emphasizing the necessity of “Improving the wastes management with the purpose of ending the wastes incineration in open air and other uncontrolled ways of incineration including the incineration in dumps. Examining the proposals to build new facilities for waste, certain alternatives should be considered like, for example, the activities to reduce to a minimum level the generation of municipal and hospital resources, including the regeneration of resources, reutilization, recycling, separation of wastes and the promotion of products which generates fewer wastes. Inside this criterion, it should be considered carefully the public health problems”. That is why, based on this type of considerations, that a draft of the Policy and Strategies for the Integral Management of Waste in Paraguay has been established.

The Convention pay special attention to the information interchange from which the decisions makers and the stakeholders engaged in the development of actions who will allow the fulfillment of the Convention should consider, including that which is required for the awareness and citizenship formation, as it is stipulated in Articles 9 and 10, and should be reflect in their implementation of national plans.

To appreciate these considerations in their right dimension, it is better to consider the National Plan of the Implementation that Parties should formulate and execute to fulfill all what was established by the Convention; it is a plan based on a country which requires reflecting in a balanced way the interests of the different social sectors. The Plan is based, also, on a diagnosis of the national situation respecting the persistent organic pollutants and the institutional capacities for its management, that leads to the proposal of cost-effective measures for the final disposal and control, as well as with the intention of strengthen such capacities; this implies, among others, the evaluation of the socio-economic implications of the POPs impact on the health and environment, and those derived from the adoption of measures for reduction or elimination of relieves in the air as well. The Convention Secretariat should be informed about it periodically.

The presentation of reports about the advances in the execution of the PNI to the Conference of the Parties is considered in the Article 15 of the Convention, where the need for the countries to generate and provide statistical or other type of data is highlighted and through which the advances can be shown in a tangible, measurable and verifiable way.

The non-compliance of the commitments adopted by the Parties at the moment of subscribing the Stockholm Convention as it is indicated in its Article 17th is subjected to what the Conference of the Parties stipulates.

The Stockholm Convention in its Article 7th. “Application Planning” establishes that:

Each part should elaborate a plan for the fulfillment of its obligations emanated from the current Convention and to make an effort to apply it; where its application plan will be

transmitted, and will be reviewed and updated accordingly in periodical intervals and in the way a decision of the Parties Conference is determined.

Process for the elaboration of the NIP

In January 2006, our country began the process of elaboration of its National Implementation Plan (NIP). During this process, the national capacity was strengthened in the knowledge of the country situation, problematic situations have been identified and different sectors of the society have been involved.

For the execution of the project, a team of National Consultants and International Experts were hired.

The development of the Project covers 5 phases, which are:

Phase 1: Establishment of the coordination and process mechanism: this phase consists mainly of the conformation of the executive work teams (Project Coordination Unit) and examiner (National Committee), with assigned roles and responsibilities; in order to obtain a consensus approved Working Plan.

The NPC is formed by different Institutions of public interest and is responsible for facilitating the coordination of the project activities, providing orientation and support to the National Director Organization (NDO) and the National Project Coordinator (NPC). In a collective way the NPC contributed to the elaboration and revision of NIP.

The Institutions which integrate the NPC are mentioned as follows:

- Administración Nacional de Electricidad /National Electricity Administration(ANDE)
- Administración Nacional de Navegación y Puertos/National Navigation and Ports Administration (ANNP)
- Alter Vida
- Centro de Producción Limpia/ Clean Production Center (CPL)
- Centro Multidisciplinario de Investigación Tecnológica/Technological Research Multidisciplinary Center (CEMIT)
- Centro Nacional de Toxicología/National Toxicology Center (CNTOX)
- Consejo Nacional de Ciencia y Tecnología/National Science and Technology Council (CONACYT)
- Cuerpo de Bomberos Voluntarios del Paraguay/Volunteer Firemen Corp from Paraguay (CBVP)
- Dirección de Vigilancia de Enfermedades No Transmisibles/Non-transmittible Diseases Surveillance Department(DIVENT)
- Dirección General de Asistencia en Emergencias y Desastres/Emergencies and Disasters Assistance General Department (ASANED)
- Dirección General de Investigación Científica y Tecnológica/Scientific and Technological Investigation General Department (DGICT)
- Dirección General de Salud Ambiental/Environmental Health General Department (DIGESA)
- Dirección Nacional de Aduanas/National Customs Department (DNA)

- Facultad de Ciencias Exactas y Naturales/Faculty of Exact and Natural Sciences (FACEN)
- Facultad de Ciencias Químicas/Faculty of Chemical Sciences (FCQ)
- Instituto Nacional de Alimentación y Nutrición/National Food and Nutrition Institute (INAN)
- Instituto Nacional de Tecnología y Normalización/National Technology and Norms Institute (INTN)
- Itaipú Binacional
- Laboratorio Central del Ministerio de Salud Pública y Bienestar Social/Central Laboratory of the Ministry of Public Health and Social Welfare
- Laboratorio Díaz Gill/Diaz Gill Laboratory
- Ministerio de Defensa Nacional/Ministry of National Defense (MDN)
- Ministerio de Educación y Cultura/Ministry of Education and Culture (MEC)
- Ministerio de Hacienda/Ministry of Economy (MH)
- Ministerio de Obras Públicas y /Ministry of Public Work (MOPC)
- OPS – WHO- World Health Organization
- Red de Acción en Plaguicidas y sus Alternativas en América Latina/Action Network for Pesticides and its alternative in Latin América (RAPAL)
- Red de ONGs Ambientalistas del Paraguay/Environmental NGOs Network from Paraguay (ROAM)
- Servicio Nacional de Calidad y Sanidad Vegetal y de Semillas/National Service of Vegetable and Seed Sanitation Quality (SENAVE)
- Servicio Nacional de Erradicación del Paludismo/National Service for Malaria Eradication (SENEPA)
- Sociedad Paraguaya de Pediatría/Paraguayan Pediatric Society(SPP)

Phase 2: Establishment of POPs Inventories and Evaluation of Infrastructure and National Capacity: This phase implies to identify the existences and emissions or relieves of POPs, through the participation of all stakeholders and mainly allows the identification of needs that the country has in order to complete the NIP. Here the Baseline is obtained to allow the country to understand the scope of the theme at a national level and be able to elaborate the Plan, this consists of:

- Update of the National Profile of Chemicals
- National Inventory of POP Pesticides
- Preliminary Inventory of Polychlorinated Biphenyls (PCB)
- Update of National Inventory of dioxins and Furans
- Inventory of potentially contaminated sites by POP and other priority substances
- Institutional Framework and infrastructure evaluation for POP management, the regulation and application of the Law
- The POP impacts over Health and Environment
- Analysis of socio-economic aspects for the POP use
- Analysis about the Risk management against POPs
- Evaluation of analytical capacities of POPs in the country

Phase 3: Evaluation of priorities and determination of objectives: in this phase the National Objectives were established in function of national priorities, of the national capacities, of the economic situation and technological reality.

Phase 4: Preparation of the National Implementation Plan: in this phase the NIP was elaborated in a participative way that consolidates action plans, addressed to the aspects of the POPs management that were previously prioritized.

Phase 5: Transference of the National Implementation Plan of POPs by the stakeholders: having the National Implementation Plan, this will be forecasted to involved stakeholders for its internalization and commitment in the framework of their capacities.

The National Plan on Persistent Organic Pollutants should perform certain tasks once the high level and specialized human resources are conformed each one in their correspondent areas, who will transmit their knowledge to the whole country, to Universities, governmental Institutions, as well as non-governmental, private enterprises and public sector, and also to develop the national inventory and the implementation of mitigation measures with the management and use of persistent organic pollutants and look for alternatives and options for them.

2. Reference point of the Country

2.1. Profile of the country

2.1.1 Geography and Population

Paraguay, located in the heart of South America, covers a surface of 406.752 Km². It is a Mediterranean country that is between the parallels 19° 18' y 27° 36' latitude south and meridians 54° 19' y 62° 38' longitude west. The Capricorn Tropic passes practically by the center of the country.

The Paraguayan territory is located around 800 km from the Pacific Ocean and at 600 Km from the Atlantic Ocean. It limits to the north with Brazil and Bolivia, to the east with Brazil and Argentina, to the South with Argentina and to the west with Argentina and Bolivia.

The Paraguay River divides the territory in two extended natural regions of different morphology: The Eastern and the Western or Chaco. The Eastern Region covers a little less than 40% of the Paraguayan territory and it characterizes by the variety of its physical and geographic aspects, where valleys alternate with extended prairies and wooded areas, cut by a dense net of surface water streams. The main elevations of the terrain are formed by three mountain ranges of middle height, Amambay, Mbaracayú and Caaguazú. Oppositely, the Western Region, with little more than 60% of the total territory, constitutes a plain characterizes by scarcity of surface water and of elevations of terrain.



The principal rivers are the Paraguay River and the Paraná River. The first one, the most important is navigable by vessels of deeper drafts from its confluence with the Paraná River until Asunción and by vessels of middle drafts from Asunción until Corumbá (Brazil) in the north.

The Paraná River constitutes the east and south limits of Paraguay, in an extension of 679 kilometers. It is navigable by vessels of any size from its confluence with the Paraguay River up to the Itaipú Hydroelectric Dam, in the Hernandarias district, and from there up to its sources in Brazil, by smaller vessels.

The type of climate is in between tropical and subtropical, leaded by a mass of tropical air and a mass of polar air, with very hot and rainy summers (from December to March) and winters with low temperatures but less rainy (from June to September). The average temperature of the year 2002 was of 24,3°C. There is a marked difference among the distribution of precipitations in both regions the country is divided in: it rains quite more in the Eastern Region than in the Western one.

The country is divided politically in 17 departments: 14 in the Eastern Region and 3 in the Western one which are Presidente Hayes, Alto Paraguay and Boquerón. Asunción, Capital of the country and the departments of Concepción, San Pedro, Cordillera, Guairá, Caaguazú, Caazapá, Itapúa, Misiones, Paraguari, Alto Paraná, Central, Ñeembucú, Amambay and Canindeyú are located in the Eastern Region. The department with the biggest surface is Boquerón, with an extension of 168.030 km², meanwhile the smaller is Central, with 2.652 km².

Paraguay is a very sparsely populated country, with a density of little more than 13 inhabitants per km². The population distribution between the Eastern and the Western Regions or Chaco is unequal; thus in the first (with 159.827 km²) 31,5 inhabitants live for each km², and in the second (with 246.925 km²) approximately one person per km².

The total population amounts to 6.009.143 inhabitants, noticing an almost equal distribution between males and females. Nevertheless, by area of living of the population it is observed a slight predominance of the urban one. The age structure revels that it is a predominantly young country, where 62,6% of the population have less than 30 years old and the group of 65 year old and more represents 6% of the total population.

According to the II National Indigenous Census of Population and Housing 2002, 89.169 people were counted as belonging to indigenous people, with a slight male predominance and a little more than the half of the total population live in the Eastern Region, situation that for the first time is presented in relation to the space distribution per regions.

The national languages are Spanish and Guarani, having both the category of official language (art. 140/the Paraguayan Constitution from 1992: “The official languages are Spanish and Guarani. The law will establish the modality of usage of one or the other. The indigenous languages, as well as the other minorities, are part of the cultural patrimony of the nation”).

2.1.2 Política and Economic profile

2.1.2.1 Political profile

Paraguay is a unitary country. The State is organized through an Executive Power leaded by the President of the Republic, elected by direct voting for a five-years-period;

a Legislative Power consisted of two Chambers, one with 40 Senators and the other with 80 Representatives or Deputies; and a Juridical Power, formed by the Supreme Court and the Courts established by the Law.

The authorities in the Departments, include Governors and the Departments Councils; and in the Municipalities, Majors and the Municipal Council; all of them elected through direct elections. In 1991, for the first time in the history of the country, direct municipal elections were celebrated, and on June 20th, 1992 a new Constitution was sanctioned that confirmed a Democrat and Social of Right State with a pluralist participation and a trend to a political and administrative decentralization.

2.1.2.2 Economic Profile

The sector of the Paraguayan economy with the most important role is the one of services, that includes commerce, gastronomy, hotel industry, finance and insurances, social and real estate services and basic services (energy, water, transportation and communication) with a total of 52 % of the Gross Domestic Product

The primary production, that means, agriculture, livestock, fishery and forestry sectors, represented 25% of the GDP in the same year. A great percentage of the agricultural and livestock products are addressed to exportation and from the exports performed by Paraguay, more than 60% come from this sector.

The industrial sector has relatively a little importance in the economy of the country. In 2005 this sector participated with only 14% to the GDP. Besides, most of the few existing industries are related directly with the transformation of primary products destined to exportation, such as cotton fibers machines, sugarcane factory, slaughter factories, oil factories, tanneries, sawmills, etc.

Regarding the foreign trade, the exports reached USD1.698,8 million, meanwhile, the imports totalized USD3.251,4 million in 2005.

The most important export products are soybean and its derivatives, bovine meat, cotton fibers, wood, leathers and organic sugar.

From the total of purchased goods in Paraguay, the most important are the ones related to the import of gasoline and lubricants, machineries, electric devices and material, terrestrial vehicles, various products of the chemical industry, among others.

Paraguay together with Argentina, Brazil, and Uruguay, is a full member of the “Mercado Común del Sur (Common Market of the South)-MERCOSUR. Bolivia, Chile, Colombia, Ecuador, Perú and Venezuela are associated members.

It is also member of the “Asociación Latinoamericana de Integración (Latin American Association for the Integration)- ALADI” together with Argentina, Bolivia, Brasil, Chile, Colombia, Cuba, Ecuador, Mexico, Perú, Uruguay and Venezuela.

2.1.2.3 Employment

During the last decades the Population Economically Active (PEA) has increased notoriously, reaching today 1.980.492 people. Out of these, 94,5% are working and the

rest are looking for a job actively. The open unemployment rate affects 6,7% of the population, that in absolute terms represent approximately 182 thousand people.

24% of the population that is employed, is really in a situation of under-employment, an amount that means a little bit more than 650 thousand people that work less than 30 hours a week, ; they would like to work more hours and are available to do it so; or they devote 30 hours or more to their activities weekly but receive an income lower that the minimum legal in force.

In past years, the population economically active worked mainly in the primary sector (agricultural and livestock activities), followed by the tertiary one (trading and services); trend that now a days is the other way round. More than the half (52,2%) of the population in work do so in enterprises or companies that belong to the tertiary sector of the economy (trading, services, transportation and financial companies). The primary or extracting sector (Agriculture and Livestock) absorbs 31,2% of the people in employment, meanwhile the secondary one 16,5% (manufacturing, construction).

2.1.2.4 Education

The amount of people that attends to a public or private school has been increasing. Now days, one out of each three people from 7 year old to older are attending to an educational institution.

The literacy population in Paraguay has increased notoriously in the last 40 years. At the present, 92% of people from 15 year old and older have the second grade approved.

Nevertheless, the educational system presents quality and equity problems in different levels, with a scarce diversification of the educative supply and the poor teacher vocational formation (one third of the positions are taken by people without teaching training).

There is a distinct difference between the youths who live in the urban areas of the country and those who live in the countryside; indeed, those who live in the urban areas have around 3 more years of study than those who live in the countryside. Moreover, only 5% of the population of 25 years old or more, have access to a university degree.

On the other hand, according to the last national census, only 1,4% of the population has an Internet account. However, it is estimated that the amount of users (many of them are connected out of their homes) is approximately 100.000. Furthermore, only 14% of the population has fixed telephone line and a scarce 5,4% has computer at home.

2.1.2.5 Health

The amount of sanitary centers and stands, that provide primary health aid, has had a sustained increase through the years, meanwhile the number of available beds for each 1.000 inhabitants of the Paraguayan population haves diminished in the period 1962-1982, and increasing again up to today, being of one bed for each 1.000 inhabitants.

On the other hand, only 18% of the population has certain type of medical cover (public or private). Most of the self-employed workers and those from the rural area lack of cover. There is no transference of benefits from one system to the other; so, moving from the public sector to the private one and vice-versa, implies the discontinuation of the contributions and benefits.

The mortality range in children younger than 5 years, as well as the children's mortality (in babies younger than one year), real the difficulties caused by poverty that affects wide sectors, as well as the deficiency of the health's services, situating Paraguay among the five first countries with the highest children's mortality index in America.

In the nineties, there was a significant reduction of the mortality rate among boys and girls younger than 5 years (from 40 out of each thousand who were born alive in 1990, it turned to 25 in 2001), even though any important improvements were registered in former years. The mortality rate of males is higher than female, and the rate is superior or higher in the most rural Department, Caazapá, in relation to the most urban one, Asunción as well.

2.1.2.6 Poverty

According to the Permanent Survey of Homes 2005, around 2.230.000 Paraguayan people live in poverty conditions, due to their income are inferior to the cost of the basic family basket of consumption.

In the rural area, poverty reaches 36,6% while in the urban area represents 39,4%.

The analysis of the extreme poverty indicates that at a national level around 902.000 people are in this situation, being the rural sector the most affected (57%).

2.1.3 Profiles of the economic sectors

2.1.3.1 Agricultural and Livestock Sector

Among the most important economic activities of the country, considering the goods production, the agriculture and livestock are the most outstanding sectors. In relation to the agricultural sector, in spite of the low productivity in the last years, cotton maintains its tradition in the country, since is the main profit cultivation for the small producers.

The main national industrial farming is the sugarcane, raw material used for the production of sugar and alcohol that is cultivated principally in Guairá, Paraguari, Cordillera and Caaguazú.

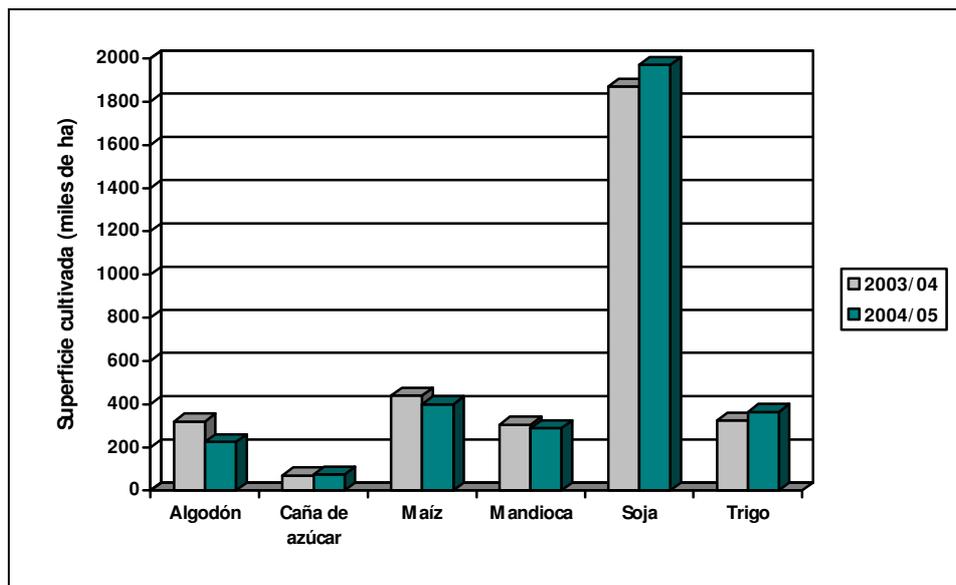
Corn, very important because of its volume of production, is a product used for self-consumption as well as for its industrialization (manufacturing of forage and balanced food) or commercialization in domestic and external markets. Alto Paraná, Itapúa, Canindeyú and Caazapá concentrate the areas of greater production of this grain at a national level.

The soybean was introduced initially to complement the rotation with wheat, winter farming, and only for domestic consumption. However, it became the principal export product of Paraguay, after experimenting growth rates with no precedents in the

mechanic agriculture during the decades of the 80s and 90s. The complex soy-wheat is cultivated mainly in the Departments of Alto Paraná, Itapúa, Canindeyú and Caaguazú.

Other cereal used for domestic commercialization is rice, sown mainly in Misiones, Itapúa and Caazapá. The tobacco continues maintaining its importance between the principal agricultural crops for export. It is mainly cultivated in San Pedro and Canindeyú.

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In relation to livestock, an important increase is registered during the last thirty years in the amount of bovine and hogs livestock. According to the amount of heads, the first of them outstands in the Departments of Presidente Hayes, San Pedro, Concepción, Amambay and Concepción, and the second in Itapúa, Alto Paraná, San Pedro, Caaguazú and Caazapá. The existence of goats, even it is very limited, is concentrated in the Western Region, particularly in the Departments of Presidente Hayes and Boquerón, and in the Eastern Region, in the Department of Ñeembucú.

2.1.3.2 Industrial Sector

A study prepared by the Ministry of Industry and Commerce reveals that, even though the participation of the industrial sector is not important yet in the national economy, its importance grows in a sustain way. According to the available data, it was maintained relatively stable in relation to its participation in the Gross Domestic Product (GDP) of the country in the last ten years, representing approximately 14,5% of the GDP in the year 2005, in relation to 14,6% in the year 2004. But, in absolute terms, there is a growth of the industrial GDP of 3,3% while the global GDP increased in 4,0% in relation to the previous year.

The analysis pointed out that the industrial products continue being orientated fundamentally toward the local market, and the data from the annual industrial survey

performed by the General Department of Statistics, Surveys and Census (DGEEC), indicate that 75,3% of the national enterprises of the industrial production sells in the domestic market; 29,2% to the MERCOSUR; and 21,1% to the rest of the world.

The most important items for export are the oleaginous seeds and plants (soybean). However, other products of a greater aggregated value are becoming more important and are growing in a significant proportion.

In the industrial sector, the growth trend is principally in the production of the meat processing plants, where even the meat is a product with a long productive performance in our country, it is experimenting a growth even greater in meat products different from the traditional bovine meat.

The plastic industries have also increased their exports mainly of the elaborated plastic items such as pipes, bottles or jars and canvas.

In the textile sector, the trend of substituting exports of raw material by those of industrialized products has become apparent in a very important way. Meanwhile the exports of raw cotton are diminishing; the exports of elaborated products are becoming more important.

At the present, most of the exported wood is serrated, streamlining, or veneering, that constitute a basic level of processing. However, the wooden products with a high manufacture processing are increasing its relative participation.

2.1.3.3 Energy Sector

The National Electricity Administration Entity (ANDE), is responsible for the generation, transmission and distribution of the electricity in Paraguay. The national demand is covered by the electricity acquired from three Hydroelectric Central Plants: Central Acaray (Property of ANDE), Yacyretá (Property of Paraguay and Argentina) y mainly from Itaipú (Property of Paraguay and Brazil).

Totalizing, the country has 53.000 GWh/year, from which it consumes approximately 7.000 GWh/year; being the only country of the region that has exceeding of hydroelectric energy.

Contradictorily, the consumption of hydroelectric energy represents only 10% of the national energy consumption. The biomass (wood, coal, fruits and grains peels, sugar cane remaining) represents the most important segment of energy consumption (59%), followed by petroleum (30%) and the bio fuels with 1%.

2.1.4 Environmental Overall State

The environmental problems that the country faces are related mainly with the indiscriminate use of natural resources as well as an inadequate management associated with an increasing urban development and the activities of the agricultural, industrial and livestock sectors.

2.1.4.1 Water Resources

Paraguay is one of the most benefitted countries due to the amount and quality of continental waters with about 18.000 m³/ inhab./year. The country possesses part of the mayor aquifer of the world that can provide of water the whole world population for hundred years. However, these resources are geographically bad distributed, abundant in the eastern region, scarce in the western area, and require of a better order in its use and a greater control of contamination by sewage, domestic and industrial waters, not treated.

2.1.4.2 Hygiene y Sanitation

A relevant problem is constituted by the low cover of sewerage system. In 2000, only 10,9% of the houses at a national level had access to a public sewage system; in 2002/03 this percentage increased to 8,2%.

2.1.4.3 Treatment of domestic residual waters

Only 8% of the residual waters are treated in the country. The National Report about Human Development (PNUD,2002) reveals the risks that result from the contamination of the water resources, since great part of the effluents are thrown out to the rivers without previous treatment in the case of cities located at the sides of big rivers.

2.1.4.4 Treatment and final disposal of solid waste

The generation of solid wastes in the country is of 1,120 kg/inhab./day for domestic solid wastes meanwhile of urban solid wastes are of 1,314 kg/inhab./day. About the urban wastes, they are collected only 53% of the total. Regarding its composition, 61% are organic and 38,9 inorganic.

In its different phases of treatment (generation and inadequate storage, inadequate disposal in the public highway, collection and transportation, segregation, treatment and final disposal) there are several environmental risks; among the most important ones are the air and water contamination, and morbid processes that go from infectious contagious and parasitical diseases, allergic diseases (respiratory, skin and mucosa), labor diseases and accidents, intoxications up to chronic degenerative diseases.

2.1.4.5 Productive Sectors

Agricultural and Livestock Sector

The expansion of the agricultural and livestock frontier at the expense of native forests; the inadequate management of agro-chemicals or agricultural defensives; the indiscriminate burning of agricultural wastes; the over pasture and the frequent burning of the field, associated to the livestock practices; the intensive use of the land and soil, with the characteristics of extensive monocultures and without the adequate practices of its protection and conservation; these are the main activities that cause an increasing environmental deterioration in our country, due to the present pattern of economic growth of the country is supported, among other aspects, in the natural resource exploitation considering the physical means as an endless resource.

Industrial Sector

The contamination of water, air and soil, due to the industrial activity, has been increased because of a growing of factory processes that involve the use of harmful chemical products for the environment. The effluent dumping without any treatment to water resources and to the soil, the disposal of industrial solid wastes were these common or dangerous into dumps or public garbage dumps and the transportation of chemical products (terrestrial and fluvial)_without contingency plans for emergencies and drainages are activities that continue occurring at national level.

At the same time, the air contamination by industrial activities lacks of a monitoring procedure and there are no national regulations with respect to the appropriate treatment of produced gas.

In summary, the principal activities that cause an increasing damage to the environment are the following:

- The expansion of the agricultural and livestock frontier at expense of the native forest.
- The inadequate management of agro-chemical or agricultural defensives.
- Indiscriminate burning of agricultural wastes, principally the cotton wastes.
- Over pasture and the frequent burning of fields associated to livestock activities.
- The intensive use of the soil, with characteristics of extensive monocultures without the adequate practices on protection and conservation.
- The inadequate management of domestic, industrial and biomedical wastes.
- The forest fires and the burning of the domestic wastes.

The principal effects in the environment are mentioned as follows:

- The disappearance of forests (with important natural sources and streams)
- The diminishing of the biological biodiversity
- The contamination of superficial and under waters.
- The contamination of vegetables and animals due to pesticides
- The degradation of the landscape
- The risks to health because of the contamination of superficial and under waters which are used for the elaboration of food and beverages
- The atmospheric contamination by fix or mobile sources, industrial as well as urban
- The erosion, degradation and exhaustion of soil
- The deforestation in private proprieties and in protected wild areas
- The lost of protected pristine

2.2 Institutional, regulatory and policy framework

2.2.1 National Environmental Policy and General Legislative Framework

In 1992, two postulates were incorporated to the National Constitution that ensure Paraguayans a minimum subsistence level and satisfy current needs without compromising those of future generations. These are “life quality” and “sustainable development”.

Thus, the duty of preserving, keeping, recomposing and improving the environment in harmony with human development in general is imposed in our legislation and governmental policy.

On this respect, Paraguay has made improvements on legal aspects in environmental matters. In 2000, the creation of the National Environmental System (SISNAM) and of its components, such as the National Environmental Council (CONAM) and the Secretary of Environment (SEAM) has meant a significant advance in the protection and conservation of the environment, creating a foundation for sustainable development and an institutional support for undertaking constitutional goals.

Therefore, through the Strategic Planning Department, it has been formulated what the National Environmental Policy constitutes, in direct articulation with the CONAM.

2.2.1.1 National Environmental Policy

The National Environmental Policy is the combined of goals, principles, criteria and general guidelines for the protection of the environment of a society with the purpose of guaranteeing the development sustainability for present and future generations.

The National Environmental Policy is based on the following principles:

Sustainability: the present generations are responsible for the protection and conservation of the environment and the appropriate use and enjoyment of the natural heritage to be inherited by future generations.

Precaution: whenever there is a risk of serious or irreversible harm, the lack of information or scientific certainty should not be used as a reason to postpone the adoption of effective measures.

Integration: this is understood as the necessity to agree upon sectorial policies and adjust the national, departmental and municipal legal framework by the prevalence of regulations that give greater protection to the environment.

Graduality: the capacity of continuous adaptation and improvement.

Responsibility: whoever harms the environment should amend the damages and restore the affected conditions.

Subsidiary: environmental management will be organized so as to achieve the greatest social prominence in the decision-making process, efficiency in resource usage and the

obtainment of results, ensuring that the decisions be made as close as possible to the general public.

2.2.1.2 Environmental Legal Framework

In this area, there are extensive legal tools such as the Constitution, international conventions, codes and laws. There also are specific legal tools such as decrees and ministerial resolutions, especially from the Ministry of Public Health and Social Welfare and the Ministry of Agriculture and Livestock, as well as from the Secretary of Environment, concerning chemicals of agricultural and sanitary use.

However, in spite of this body of laws, none of the stages of the life cycle of chemicals are adequately covered, being the industrial chemicals sector the one which possess the fewest legal instruments compared to agricultural and public consumption chemicals.

The legal framework considered in the current document for the management of chemicals in Paraguay is as follows:

Table 1: Environmental Laws/ General Description

National Law	General Description
Law 1561/00 – That creates the SISNAM, CONAM and SEAM	Its purpose is to create and regulate the operation of the organizations responsible for the elaboration, normalization, coordination, execution and supervision of the national environmental policy and management. – Article 2 – That establishes the National Environmental System (SISNAM) – Article 3 - That creates the National Environmental Council (CONAM) – Article 7 – That creates the Environmental Agency (SEAM)
Law 2459/04 – That creates the SENA VE	Creation of the National Vegetable and Seed Quality and Health Service (SENAVE), agency in charge of applying the conventions and international agreements Paraguay is member or party of, which are related to vegetable quality and health, seeds, the protection of vegetable obtainments and of biotechnologically originated species
Law 294/93 – Environmental impact evaluation	That states that an environmental impact evaluation is to be mandatory for human products or activities which affect life in general, biodiversity, quality, a significant amount of natural or environmental resources and its utilization, welfare, health, personal security, habits and customs, cultural heritage or legitimate means of life
Law 716/96 – That sanctions environmental crimes	This law establishes sanctions against those who order, execute or, regarding their authority, allow or authorize unlawful activities against the balance of the ecosystem, the sustainability of natural resources and human life quality
Law 42/90 – That prohibits the importation and use of hazardous residue or toxic garbage	In which any natural person or legal entity is prohibited to import products qualified as residue, hazardous industrial waste or toxic garbage, and assist, by any means, in its entrance, reception, storage, use, or distribution anywhere inside the country
Law 123/91 – That adopts new phytosanitary protective regulations	This law establishes that those who devote themselves to the synthesis, formulation, export, fractionization, commerce and commercial application of pesticides, fertilizers and similar substances are under obligation to register them in order to obtain operational permits. They must also register their trademarks and state the origin and formulation of their components

National Law	General Description
Law 1183/85 – Civil Code	Article 2000. The owner is under obligation by right, especially in industrial development works, to refrain from any excesses to the detriment of neighborhood property. Smoke or soot emissions, harmful and disturbing emanations, noises, damaging vibration that exceed neighborhood tolerance limits considering local use, the situation and nature of the real estate are particularly prohibited
Law 1160/97 – Penal Code	The chapter on “Punishable facts against natural foundations of human life” considers different activities susceptible of sanctions or fines
Law 1294/87 - Municipal Organic Law	The Municipal Organic Law establishes that municipalities are responsible for “regulating and rendering sanitation services, especially the collection and disposal of residue”
Law 836/80 –Sanitary Code	That establishes the regulations to which labor, industrial, commercial and transportation activities should adjust in order to promote preventive and controlled contamination programs, dispose preservation measures and perform regular environmental controls in order to detect eventual atmospheric, soil, water and food deterioration
Law 1095/84 – That establishes customs tariffs	That prohibits the importation of articles that could affect national security, public health, animal and vegetal health
Law 2422/04 – Customs Code	That addresses prohibited unspecified merchandise, expired storage of altered or harmful products and the characteristics and mobilization of containers
Law 1119/97 – That approves of health products and any other related item	The present law and its corresponding regulations control the fabrication, elaboration, fractionization, quality control, distribution, prescription, exemption, commerce, information, publicity and evaluation, authorization and registration of human-employed medicine, drugs, chemicals, reagents and any other product used and applied in human medicine, cosmetics and sanitary products
Law 3239/07 – Water resources of Paraguay	This law fills in a very important legal gap in Paraguay, where water is a strategic natural and non-renewable resource. Until now it did not have an appropriate legal regulation, fact that attempted against its future availability

Table 2: Environmental Laws / Regulative Decrees and Resolutions

National Law	Decrees and Resolutions
<p>Law 1561/00 - That creates the SISNAM, CONAM and SEAM</p>	<p>Decree 18831/86 That establishes environmental protection regulations Decree 20309/03 That creates a national focal point for the Basel and Rotterdam Convention in the SEAM Decree 4006/04 That designates the Strategic Planning Department of the SEAM as the National Coordination Center regarding the application of the Stockholm Convention on Persistent Organic Pollutants</p>
<p>Law 2459/04 – That creates the SENAVE</p>	<p>Decree 11502/91 That adopts requirements concerning cotton seed pesticides Decree 15000/96 That disposes the use of the resolutions adopted by the Common Market Group of MERCOSUR in reference to sanitary, phytosanitary and seed regulations in the Republic of Paraguay Decree 1825/04 That designates the Vegetal Defense Department, subordinate to the Ministry of Agriculture and Livestock (MAG), as the National Authority in matters of pesticides regarding the Rotterdam Convention on prior informed consent procedures (PIC) applicable to the international trade of certain pesticides and hazardous chemicals SENAVE Resolution 446/06 That approves of and establishes the use of SENAVE regulations for the control of agricultural pesticides SENAVE Resolution 139/07 That authorizes the use of single border crossings for the entrance of agricultural pesticides SENAVE Resolution 371/07 That approves of the use of SENAVE regulations for the registration and means of transport of active ingredients and formulated agricultural pesticides</p>
<p>Law 294/93 - Environmental impact evaluation</p>	<p>Decree 14281/96 That regulates Law 294/93 on environmental impact evaluation Resolution 255/06 That establishes the classification of superficial waters in the Republic of Paraguay Resolution 222/02 That establishes the water quality model in the country Resolution 51/06 That establishes the environmental technical specifications for the safe management of agricultural pesticides</p>
<p>Law 42/90 – That prohibits the importation and use of hazardous residue or toxic garbage</p>	<p>Decree 18969 / 97 That regulates Law 42/90 Resolution 750/02 That regulates the management of hazardous and municipal solid residue</p>
<p>Law 836/80 – Sanitary Code</p>	<p>Ministry of Public Health and Social Welfare (MSP & BS) Resolution 750/02 That regulates the management of urban, hospital, and hazardous solid residue MSP & BS Resolution 45/01 “That creates the Operative and Management Technical Unit of MSP & BS hospital solid residue incinerator plants to be administered by the SENASA“</p>
<p>Law 3239/07 – Water resources of Paraguay</p>	<p>Resolution 255/06 That establishes the classification of superficial waters in the Republic of Paraguay Resolution 222/02 That establishes the water quality model in the country</p>

National Law	Decrees and Resolutions
<p>Law 123/91 – That adopts new phytosanitary protective regulations</p>	<p>Decree 2048/04 That regulates pesticide management established in Law 123/91 Decree 28657/72 That prohibits the application of organochlorine insecticides on tobacco during its vegetative development, as well as in any elaboration and conservation phase of the harvested product Decree 17487/97 Alimentary Codex Committee Decree 5043/99 That disposes the use of the resolutions adopted by the Common Market Group of MERCOSUR in reference to phytosanitary product harmonization in the Republic of Paraguay Decree 13861 That regulates the use and management of phytosanitary products established in Law 123/91 Resolution 87/92 That prohibits the use of organochlorine insecticides Resolution 447/93 That prohibits the importation, formulation, distribution, sale and use of organochlorine insecticides Resolution 448/93 That prohibits the use of pentachlorophenates or other organochlorine products in wood treatment Resolution 1000/94 That regulates the registration of agricultural phytosanitary and pesticide products Resolution 440/94 That establishes the toxicological classification of phytosanitary products Resolution 441794 That establishes the requirements for the authorization of phytosanitary product fraction plants Resolution 443/94 That approves of inscription regulations for agricultural pesticide labels Resolution 878 /96 That regulates the use or market withdrawal of expired phytosanitary products Resolution 49 /01 That implements the Previous Import Authorization System for agro-chemicals (APIM) Resolution 231/03 That establishes quality control analyses of all imported pesticides, and of those formulated in Paraguay before their commercialization Resolution 280/03 That implements types of formulation for agricultural pesticide registration Resolution 295/03 That establishes regulations for agricultural pesticide labeling Resolution 296/03 That establishes the model protocol for agronomical effectiveness testing of agricultural pesticides Resolution 297/03 That establishes import regulations of pesticide samples for agronomical effectiveness testing Resolution 311/03 That designates the SENAVE phytosanitary quality control lab to perform pesticide quality control analyses Resolution 400/03 That approves of regulations for the control of agricultural pesticides</p>

2.2.2 Governmental functions and responsibilities in the POP life cycle

In the following Table the Governmental Institutions which are more directly related with the POPs management along the life cycle of these products are shown:

Table 3: Governmental institutions / Functions and responsibilities related to POPs

Governmental Institution	General Function	Specific functions related to POPs
Environmental Agency (SEAM)	Formulation of policies, the coordination, supervision and execution of environmental actions, plans, programs and projects to guarantee long-term conditions of economic growth, social equity and ecological sustainability	It is the focal point of the Basel and Stockholm Conventions It is the application authority of Law 294/93 that stipulates that projects or activities which can cause environmental harm should undergo an environmental impact evaluation under obligation It is the application authority of Law 42/90 that prohibits the entrance, storage and use of hazardous residue or toxic garbage, and establishes no fulfillment penalties
Ministry of Public Health and Social Welfare (MSP & BS)	To define and direct central governmental sanitary policies that imply the development of sanitary programs, including public services, environmental sanitation, vector eradication, science and technology	Control and treatment of intoxicated people through the Toxicological National Center (CNTOX) Prevention, preparation, response and rehabilitation of health services through the Emergency and Disaster Relief Department (ASANED) in emergency and disaster cases Execution and supervision of environmental sanitation programs related to drinking water supplies, solid residue disposal, work environment security controls, and registration of risk II sanitary products through the Environmental Health Department (DIGESA) Alertness, prevention and control of non-transmissible diseases through the Non-transmissible Disease Department (DIVENT) Control and vector eradication through the National Malaria Eradication Service (SENEPA)
Ministry of Agriculture and Livestock (MAG)	To promote the competitiveness of the farming and forest production chain in Paraguay through conditions of free market, social equity and environmental sustainability	Protection, maintenance and increase of phytosanitary conditions and of the quality of vegetal products (SENAVE) To register and control ingredients of agricultural use according to legal regulations (SENAVE) It is responsible for the elaboration, regulation, coordination, execution and supervision of animal sanitation and alimentary innocuousness related programs (SENACSA)

Governmental Institution	General Function	Specific functions related to POPs
Ministry of Industry and Commerce (MIC)	To establish clear policies directed to the strengthening of the industrial, commercial and service sectors	To support the environmental adapting of industries; arrange for international economic support and, together with public and private institutions, formulate realistic and efficient environmental policies, mainly in industrial activities through the Environmental Technical Department
Ministry of Public Works and Communication (MOPC)	To guarantee the creation of highway infrastructure, attend to its maintenance and inform the population on its creation as well as on its use and maintenance	It is in charge of highway construction environmental studies and of the supervision of mitigation plans through the Environmental Unit To establish the technical characteristics and conditions that transport units should be required in order to circulate and be responsible for the application of international conventions in the areas of their competence through the National Transport Department (DINATRAN)
Ministry of Education and Culture (MEC)	To guarantee quality education in order to contribute to the improvement of life conditions of the population	To improve the foundations for the inclusion of environmental subjects in the curriculum To develop educative, scientific and technological investigational programs To promote the use of the media for educational purposes
Ministry of Finance	To guarantee fair tax collecting, and equitably assign resources for public spending in order to promote economic, social and human development	To perform the programming, formulation, control and evaluation of the public sector budget process (Undersecretary of Financial Administration) To apply the Customs Legislation and assist commerce, supervise trade efficiently, prevent and check contraband, protect society and generate important resources for the country
Office of Public Prosecutor	To promote penal public actions in defense of our public and social heritage and of the environment	To investigate punishable facts against the environment through the Office of the Environmental Public Prosecutor – Specialized Environmental Unit
Ministry of Justice and Labor	Attend to the fulfillment of General Technical Regulations on Security, Medicine and Work Hygiene and of the Labor Code	It is in charge of work hazard prevention policies and performs workplace controls in order to avoid the harmful health effects of physical, chemical and biological agents present during production through the Hygiene and Work Security Department

Governmental Institution	General Function	Specific functions related to POPs
Ministry of National Defence	To develop governmental military plans, participate in the formulation of national security policies and formulate and execute military policies	To plan military activities regarding internal and external environmental management and participate in national environmental planning through the CONAM (National Environmental Council)
National Administration of Electricity (ANDE)	To satisfy national electric energy needs in order to develop and assist in the welfare of the population	To guarantee sustainable development through consideration of the environmental legal framework and the prevention of environmental impacts associated to their activities
National Institute of Technology and Normalization (INTN)	To support society, consumers, industries, commerce and services by the assistance in applied investigation, development, innovation, technological services, normalization, certification and metrology	To elaborate national technical regulations with the participation of all the parties and to impulse the Paraguayan contribution in the homologation of regional (MERCOSUR) and international regulations To certify products, processes, services, personnel, and Quality Management Systems of companies
National Council of Science and Technology (CONACYT)	To lead, coordinate and evaluate the National System of Science, Technology and Innovation as well as the National System of Quality	To lead and administrate the National System of Accreditation and to grant the accreditation at a national level through the National Accreditation Organization (NAO)

One of the principles of the National Environmental Policy (2.2.1.1), establishes the importance of the participation of all sectors in the environmental management, in order to guarantee that the decision making represents the interests of all citizens. In this way, the Non-governmental Organizations and Labor Union Associations from different economic sectors has been provide with a greater participation in the decision making issue respecting the environmental sector.

In the following Charts, the main environmentalist NGOs and Labor Union Associations which have certain relation with the environmental management in our country are presented:

Table 4: Non-Governmental Institutions/Work Sectors

Non-governmental Institution	General description	Work Sectors
Alter Vida	<p>It is a non-governmental organization (NGO), without financial reward whose purpose is to promote the research, education, professional formation and training in the environmental issue, the sustainable development, positioning the necessity to consider the environment as well as the citizenship participation, as factors and pre-conditions for the sustainable development of the country</p>	<p>Agro-ecology: the program support several farmers organizations and associations in producing and trading of fruits and vegetables with ecological quality; at the same time the consumers are being aware about the advantages of consuming goods without agro-toxics.</p> <p>Biodiversity: the program covers Topics such as Conservation of Protected Areas (Public, Community and Private), the Evaluation and Monitoring of the Environmental Impact from the point of view of biological diversity, Environmental Education in Protected Wild Areas, etc.</p> <p>Broadcasting and Radio: Consist on the creation of expression and communication spaces for different sectors of population, through Radio stations, news booklets, monthly magazines and Communication Centers in poor resources sectors.</p> <p>Sustainable Rural Development: It looks for sustainability of rural development through the implementation of productive systems and the replication of positive experiences.</p> <p>Environmental Management and local development: It has as an objective to promote the decentralized local environmental management and to Foster development sustainable Project through the technical support to local governments and civil society organizations</p>
IDEA	<p>The Environmental Law and Economy Institute is a nongovernmental organization without financial reward, constituted in the Republic of Paraguay, whose mission is to promote the sustainable development through the law and the economy in benefit of the public interest.</p>	<p>Investigation, training, diffusion and design of public policies, focusing on the environment protection of faire economic models which combined with the sustainable development and conservation of natural resources.</p>
POJOAJU	<p>The Non-governmental Organizations Association of Paraguay, POJOAJU, is an non-financial reward entity, with legal status, constituted with the purpose of articulating in a coordination instance the NGOs and the NGOs Networks in Paraguay</p>	<p>To strength links between members of NGOs and the NGOs Networks, fostering their capacities at an institutional as well as labor union level; to develop relationship and cooperation strategies with other sectors, public as well as private, national and international; to concrete agreements and to establish links with organizations and institutions, in order to contribute and foster the elaboration of social development policies through the coordination of efforts and resources of them</p>

Non-governmental Institutions	General Description	Works Fields
RAPAL Paraguay	The Pesticides Actions and their alternatives in Latin America Network, is a network of organizations, institutions, associations and individuals, integrated by 17 countries who opposes to the massive and indiscriminating use of pesticides, presenting alternatives to reduce and eliminate its use.	They generate awareness about the risk in the use of Pesticides, foster political and legal actions for the eradication of pesticides and the implementation of alternatives; they inform people about the risks of pesticides in health and the environment, promote the investigation and diffusion of ecological alternatives viable to the pesticides; they are conducive to citizens participation and environmental education, promote studies about the pesticides impacts on health and environment, etc.
ROAM	It is the Network of NGOs environmentalists of Paraguay; it is a Civil Association with financial reward whose main objective is the Protection, Improvement of the Environment and the promotion of a Sustainable Development	To establish alliances with the local government, the national social organizations and other networks in order to influence on the National Environmental Policy, in the Secretary of Environment (SEAM) and in the National Environment Council (CONAM); to build up responsible opinion about environmental conflicts (agro toxics, deforestation, waters, mineral and hydrocarbons prospection in protected areas) in different means of communication; coordinate Actions with the National Parliament and the Public Ministry the following up of environmental conflict; to promote the transparency management in coordination with the General Attorney of the Republic of the Institutions in charge of the environmental issues.
Sobrevivencia(Supervivence) / Amigos de la Tierra(Friends of Earth)	Organization of the Paraguayan civil society which care about the investigation, actions and socio-environmental management, focused on the improvement and restoration of the community, the habitat and the environment life conditions.	It develops tasks looking for a sustainable production and the fair and solidarity commerce, as well as it respects to training, public policies, restoration and conservation of biological and cultural diversity, concretion of departmental and municipal legal frameworks, strengthening of community organizations and local government through pilot experiences replicated at a national as well as regional and international level.
WWF Paraguay	The World Wildlife Fund has as an objective to provide real solutions on a sustainable development basis as its objective, promoting a rational use of the natural resources.	It works in collaboration with other countries, local communities, international agencies, as well as with enterprises and industries to provide realistic solutions to most demanding environmental problems.

Table 5: Union Associations /Work fields

Association Gremial	Description general	Areas of Work
ARP	The Rural Association of Paraguay, ARP, is an association of common welfare without financial reward, constituted by ranchers and agricultural producers. It supports its associates in an integral way (an organization without financial reward). For the defense of their labor union interests and the improvement of the economic, social and cultural level.	Its principal objectives are: the defense of the labor union interests, the development and improvement of agricultural and livestock production and of complementary and derivatives industries as a way to contribute to the development of the country: broadcasting of knowledge and most efficient, economic and practical exploitation methods and counseling in its companies: the promotion before the Public Powers and Financial, commercial and industrial entities of the adoption of policies and measures focused and trending to incentive the rural activities,
CPL	It is an organization without financial reward, autonomous and independent, impelled by the Paraguayan Industrial Union and the Catholic University, which finality is to promote actions for the implementation of techniques and methods of a cleaner production in Small and Medium-Size Industrial Enterprises.	Counseling on development and application of techniques, methods and technologies for a cleaner production which allow to apply a preventive strategy integrated to processes, products and services in order to increase efficiency and reduce risks for human beings and the environment; through Policies, Laws, Incentives proposals,, etc.; technical documents and training events by sectors; development of programs on a Cleaner Production in enterprises; etc. Counseling.
FEPRINCO	The Production, Industrial and Commerce Federation (FEPRINCO), is a labor union organization of economic entities, without financial reward which groups the three more representatives sectors of the national entrepreneurship.	It promotes the commitment in different economic activities; It is involved in the elaboration of laws and decrees from the Executive Power which affects their interests as well as in the modification or suppression which damage; it collaborates in different committees and in the performance of public and/or mix entities, and gives its opinion is a systematic way in topics of public policies decisions, having for this with a broad cover of the media; it organizes and/or participates in congresses and conferences about economic topics at national and international level.
UIP	It is an association of Enterprises and Industrial Companies in different sectors of production, whose mission is to satisfy through its service, the necessities and expectative of its associates and through them to the whole country, promoting the improvement of the life quality.	It has international cooperation projects and offers its associates, counseling and services in technologies, information and training transference on different topics where the following are highlighted: to generate quality and productivity initiatives which might improve the enterprise competitiveness: jointly with the ARP it carries out every year the largest exposition faire of industrial and livestock enterprises of the country (EXPO), contributing with it to promote innovations and to improve the quality of national products; to provide technical and juridical counseling among others.

2.2.3 Pertinent international agreements and obligations

Table 6: International Conventions and Protocols signed and ratified by Paraguay

Convention	Promulgating Law	General Objective
Basel Convention	Law 567/95 “That approves of the Basel Convention on border control of hazardous waste and its elimination” Law 1262/98 “That approves of the amendment to the Basel Convention”	To reduce the volume of residue exchange in order to protect human health and the environment establishing a control system on the export and import of hazardous residue as well as its elimination
Rotterdam Convention	Law 2135/03 “That approves of the Rotterdam Convention on prior informed consent (PIC) procedures applicable in the international trade of certain pesticides and hazardous chemicals”	To promote shared responsibility and cooperative efforts among parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm
Stockholm Convention	Law 2333/03 “That approves of the Stockholm Convention on Persistent Organic Pollutants”	To protect human health and the environment from Persistent Organic Pollutants
Vienna Convention	Law 61/92 “That approves of and ratifies the Vienna Convention on the protection of the ozone layer”	To protect human health and the environment from the negative effects caused by modifications in the ozone layer
Montreal Protocol	Law 2889/06 “That approves of the Montreal Protocol related to the substances that deplete the ozone layer”	To protect the ozone layer by taking precautions in order to control global emissions of substances that provoke its diminution
Kyoto Protocol	Law 251/93 “That approves of the Convention on Climate Change adopted during the Conference of the United Nations on the Environment and Development – the Earth Summit”	To establish binding agreements that state quantified and calendarized objectives of greenhouse gas emission reductions
Cartagena Protocol	Law 253/93 “That approves of the convention on biological diversity” Law 2309/03 “That approves of the Cartagena Protocol on biotechnological security from the convention on biological diversity”	To assure an adequate protection level in the safe transference, manipulation and use of modified living organisms produced by modern biotechnology that could have adverse effects in the conservation and sustainable use of biological diversity, considering human health and focusing on border crossings

2.2.4 Legislation and regulations on POPs

In regards to POP pesticides, since 1993, by means of MAG resolutions 447/93 and 448/93, both under the protection of Law 123/91, the importation, formulation, distribution, sale and use of organochlorine insecticides for agriculture, as well as products that possess as active ingredients for wood treatment have been prohibited. In this way, the entrance and commercialization of these products in the country are relatively controlled, although there are no established mechanisms of control that ensure the non-entrance of these substances into the country or an adequate monitoring of environmental matrixes and foods.

As to polychlorinated biphenyl, Paraguay does not have specific regulations on the use and management of this pollutant. Ever since the approval of the Basel and Stockholm Conventions, its use and management have been regulated. The development of a ministerial resolution that takes into account every aspect related to PCB management, including the prohibition of its entrance and use in newly fabricated equipment, is considered to be important. In that regard, a resolution was elaborated under the responsibility of the SEAM, whose approval and diffusion is foreseen for the first trimester of 2008.

Regarding dioxin and furan emissions, Paraguay lacks regulations that govern unintentional POP emissions. It is important to highlight that in Paraguay, even though atmospheric contamination is considered in the Civil Code, the Penal Code and the Sanitary Code, emission parameters of atmospheric contaminants in general are not established. A strengthening of the laws in this aspect is of the utmost importance.

2.2.5 Key approaches and procedures for POP management

One of the main points to strengthen in the framework in order to fulfill with the Stockholm Convention, is the Institutional Capacity of the country for an appropriate control and monitoring of POPs throughout its life cycle, as well as to establish the necessary mechanisms for an efficient governmental intra-institutional coordination, giving at the same time a greater participation for the implementation and assessment of proposed actions in the PNI to the private sector, NOGs and Educational and Research Centers.

The main products and advances in the elaboration of the PNI are:

- Evaluation of pesticide management in the country with an emphasis on POP pesticides in stock
- Evaluation of PCB management in the country and the execution of a preliminary inventory of used and unused stocks
- Inventory update on dioxin and furan emissions
- Identification and preliminary diagnosis of potential POP contaminated sites
- Update of the Chemicals National Profile
- Evaluation of POP management national capacities
- Analysis of socioeconomic impacts derived from POP management

2.3 Evaluation of the POPs issue in the country

2.3.1 POP Pesticides

The agriculture constitutes a central component of the Paraguayan economy, and its growth during the last 4 decades carried out an intensive and indiscriminating use of a great variety of Pesticides; this accompanies of a scarce regulation and a lack of technical tools for its application, results in numerous negative consequences associated with human health and environmental, along the life cycle of these products.

For this reason, in this section are evaluated not only the inventoried amount of POPs Obsolete Pesticides but also the aspects related to the Pesticides Management in our country.

The methodology of work for the collection of data that are presented as follow was based at a first instance in a follow-up of the Obsolete Pesticides Inventory performed by the SENAVE with the support from the FAO.

On the other side, and due mainly to the scarce existing information about the use of POPs Pesticides in the country for the control of vectors, some interviews to the engaged stakeholders in this type of operations.

During the process the NGOs Alter Vida and RAPAL, Paraguay were consulted, mainly respect to information about the present use of Pesticides and their generated impacts.

Finally, and concerning data about the volumes of Pesticides that are handled in the national territory, the normative instruments and the control over these products management, the principal Institutions engaged in the Pesticides Management in the country were consulted and evaluated.

2.3.1.1 Importation and exportation of Pesticides

The import of Pesticides during the year 2005 exceeded 19.000 tons, representing an increase of 73% during the last decade, being the main used products: Glyphosat, Paraquat, Cipermetrina, Acephato, Endosulphan, Tebuconazole and Carbendazim.

The production of Pesticides in the country as well as the export is low; the later is generally centralized in the MERCOSUR markets and the European Union countries, representing 17% of the import volume.

Concerning the entrance of POPs Pesticides into the country, at national level there is no record of import of Pesticides listed in the Convention previous to the year of its banning (1993), but there is a knowledge that up to the year 1992, it still continued entering in a legal way Aldrin, Endrin, Dieldrin, Chlordane, DDT, HCB, Heptachlor and Mirex, for agricultural purpose as well as for vectors control.

Even though there is no record that might confirm that POPs Pesticides have entered the country later their banning, there are no established procedures for the Control of active principles for the imported Pesticides.

Presently, the SENAVE opened a Laboratory of Pesticides Quality Control, but it is of the main importance to establish with more clearness the roles and responsibilities of the Engaged Institutions (DNA – SEAM – SENAVE) and strengthen the work coordinated among the parties, since at the present there is not any procedure manual which were clear and approved by consensus.

2.3.1.2 Production and Commercialization

The national production of Pesticides is centered rather in the fractionation and bottling and in a lower percentage in the formulation. In the national territory there are 6 formulation companies and more than 300 trading companies. The registrations for the formulation, fractionation, and commercialization are in charge of SENAVE.

On the other side, the sale of these products are not duly controlled either, being possible to find a wide variety of Pesticides for domestic-sanitary and veterinarian purpose in stores and supermarkets.

Concerning the POPs Pesticides, any of those Pesticides listed under the Stockholm Convention have been produced in our country, even though they were traded previously to the year of prohibition, as it is expressed in the previous item.

2.3.1.3 Use of Pesticides

The use of Pesticides at national level occurs principally in the agricultural activities, being the principal products used: Glyphosato, Paraquat, Cipermetrina, Acefato, Endosulfán, Tebuconazole and Carbendazim.

In relation to Organic-chloride Pesticides, the Endosulfan is not banned yet in our country, and it is used mainly in soybean and rice growing as well as in horticultures (watermelon, melon, tomato and pepper) and in a minimum way in wheat crops.

The practices found at national level mostly show ignorance and/or a lack of awareness about the harmful effects that these products could have on health and the environment. Some of them are: the manufacturing of inadequate mixtures, the absence in the use of protection equipment to manipulate such substances, the inappropriate use of empty containers, storage in a domestic environment of Pesticides, etc.

Concerning the POPs Pesticides, there is no record of the usage of Pesticides previous to year 1993; it is known only about the use of them for agricultural activities and for the vectors' control in previous years to their banning, but not about the quantities used.

2.3.1.4 Storage and Final Disposal

One of the principal problems at national level consists on the inappropriate disposition of products that past their expiration or those that have gone bad, and wastes generated due mainly to the absence of a specific regulation for harmful wastes and to the lack of human and technical resources for an appropriate control by the responsible Institutions.

Even though there is, indeed, a regulation that contemplates the adequate conditions for the storage of chemical products and goods, it does not include the aspects related to the

labor security and the prevention and containment of accidents or drainages. The institutions responsible of this issue do not have a Procedures Handbook in case of disasters.

On the other side, the inventoried stores in the framework of the SENA-FAO Project are in general in urban areas and do not fulfill with the minimum conditions required for storage. In many of the inspected places, products in bad packaging were found, presenting leakages and contaminating not only the structure but also other storage products.

Moreover, the fact that the engaged personnel do not use any kind of protection to handle this type of substances, mainly due to the lack of knowledge about the harmful effects on health.

2.3.1.5 Obsolete POPs Pesticides

Paraguay is one of few countries in Latin America that has a National Inventory on Obsolete Pesticides, just completed by SENA, with the support of the FAO. The Inventory covered 15 Departments and in all of them cumulated stocks of Obsolete Pesticides.

Among the found Pesticides, stocks of Organic-chloride were identified, including those listed in the Stockholm Convention. The amounts and location of them are expressed in the following Table:

2.3.1.6 Table 7: Obsolete POPs Pesticides/ Quantity/ Location / Conditions

Product / material	Commercial Name	Quantity	Department	Conditions
Endrin	Endrex 20	20 Litres	Amambay	Metal container with small damage
Chlordane	Chlordane	20 Kg	Cordillera	Paper packaging, close and in good condition
Chlordane	Chlordane	300 Kg	Cordillera	15 in paper packaging, open and scattered
HCB	PCNB	6 Kg	Itapúa	2 containers in good condition
Empty containers of DDT and Mirex	-	750 Kg	Central	150 metal containers

In the Cordillera Department, specifically in the Deposit E from IAN, 15 containers of 20 kg of Chlordane, opened and scattered, are mixed with different materials consisting of cardboards, glass, plastics, unknown powders, insecticides drums, etc; for this reason it is estimated that the material contaminated with this Pesticide reaches 4, 5 tons.

Due to the general bad conditions of the infrastructure, the bad collection and the deterioration of the containers found in this place, and that the deposits are communicated among them, it is assumed that all the present material (excluding the infrastructure), that reaches 20 tons approximately, might be contaminated with Chlordane.

Among other Obsolete Pesticides found, are also included 2,500 liters and 550 kg. of Endosulphan distributed in the Departments of Boquerón, Caazapá, Central, Cordillera, Paraguari and San Pedro; also, 1 liter of Dicofol in the Boquerón Department.

2.3.1.7 Use of DDT

The use of DDT in Paraguay for the control of vectors is recorded later than the year 1954, when it replaced the Dieldrin up to the year 1973, period when the eradication of malaria was certified in the national territory. However, in 1984 when the malaria started again in Paraguay, the DDT started to be used again until the year 1992.

The DDT, was banned in 1993, for agricultural purpose; besides the health sector, even without an expressed prohibition by the legal mechanisms, it is not used any more in health /sanitary campaigns against vectors that transmit diseases, being replaced by phosphoric insecticides and piretroides.

2.3.1.8 Data about control of Pesticides and their impact on health and the environment

A study did by the NGO Alter Vida in 1991, in relation to the presence of Pesticides used in farming products in the Central Department, shows some traces of organic-chlorides in vegetables.

The pesticides used in such time by the surveyed people who performed farming activities were the following: Methamiphodos (53.76%); Carbophuran (45.38%); Methyl Parathion (37.63%); Aldrin (33.33%); Monocrotophos (22.58%); Endosulfan (16.12%); Captafol (5.45%); Methomyl (4.30%); Demeton-S-metil (3.22%); Chloropicrin+ Methyl bromide (3.22%); Phosphamidon (3.22%) and Lindane (2.15%).

Even though the study shows that the approximation to the health issue was only superficial; 75% expressed that with certain frequency some health problems appear, principally in children. Even, only 54% of the surveyed people were able to recognize the symptoms of poisoning, 58% reported death cases for application, preparation or contact with agrochemicals. In total, 46 cases of death were reported. 26 cases of abortion were reported, may be related to the exposition to agro-toxics.

Among the symptoms that 54% of the surveyed people were able to report because they suffered them, it was possible to record symptoms of acute intoxication, such as: Headache (12 a 17%); dizziness (6-14%); vomits (5%); nauseas (4%); trembling (1-4%); weakness (1-2%); much sweating (2.4%); blurred vision (5%); oppression in the chest (2-5%); tearing (1-6%); diarrhea (2-4%); lack of appetite (1%); general unwell feeling (1%); extremities hardening (3%); kidney illness (4-10%).

On the other side, some products were sampled: Swiss chard, scallion, lettuce, parsley, spinach, pepper, tomato, eggplant, carrot and cabbage.

The analyses were performed through the Gas Chromatography system, for two chemical groups, chlorides and phosphorides. As a comparison pattern, the values

recommended by the FAO/WHO Convention of Codex Alimentarius were used (years 1978 and 1987).

The chemical analysis made by the Technological Development Institute of Chemical Industry (Instituto para el Desarrollo Tecnológico de la Industria Química)-INTEC from Santa Fe, Argentina, reported by Alter Vida in 1991, showed the following concentration of persistent organic pollutants

Table 8: POP Pesticides / Farm Products Analysis

POPs Pesticides	Analysed Product	Content of pollutant (mg/kg)	FAO limit in food allowed (mg/ kg)
Heptachlor	Swiss Chard	0.003	0.05
Heptachlor	Scallion	0.0447	0.05
Heptachlor	Pepper	0.0003	0.05
Heptachlor	Lettuce	0.002	0.05
Heptachlor	Carrot	0.002	0.2
Heptachlor	Parsley	0.0002	0.05
Heptachlor	Eggplant	0.0004	0.05
Heptachlor	Spinach	0.001	0.05
Heptachlor	Brazilian Tomato	0.0033	0.02
Chlordane	Pepper	0.0003	0.02
Chlordane	Brazilian Tomato	0.0018	0.02
Chlordane	Paraguayan Tomato	0.0002	0.02
Chlordane	Curly Lettuce	0.03	Not mentioned
Chlordane	White Lettuce	0.05	Not mentioned
Aldrin	Lettuce	0.002	0.1
Dieldrin	White Lettuce	0.60	0.1
Dieldrin	Curly Lettuce	0.56	0.1
Dieldrin	Eggplant	0.03	0.1
Endrin	Onion	0.076	Not mentioned

As it is observed in the previous chart, the concentration of organic pollutants wastes for the year 1991 did not exceed the values recommended by the FAO but in two cases (wastes of Dieldrin in white and curly lettuce).

Nevertheless, in the year 1992, there was an alert calling regarding a massive contamination of fish due to chlorinated pesticides. The Sub-Secretary of Livestock performed a sampling and detected DDT, some of its metabolic and Lindane. Besides, in a sampling made on a bovine fat tissue, the presence of DDT, Dieldrin and Lindane were found (Idoyaga, 1993).

By 1995, a research made by ENAPRENA detected concentrations of agro-chemicals in 5 species of fish used for human food (surubí, dorado, pacú, patí and bagre). Inside these compounds, DDT was found. It was also found that organic-chlorinated pesticides which are not hydrolyzed were detected in waters of Parana River and the Itaipú Reservoir in several occasions, and they were also found in sediments of both rivers confirming the transportation which occurs due the absorption of the soil and its later dragging by water currents.

Regarding the reports on poisonings by pesticides, for the year 2004, the Ministry of Health reported 277 cases of poisonings by pesticides. These cases were presented in the following way: Concepción 1 case; San Pedro 40 cases; Cordillera 1 case; Guairá 7 cases; Caaguazú 13 cases; Caazapá 1 case; Itapúa 29 cases; Misiones 1 case; Paraguari 3 cases; Alto Paraná 11 cases; Central 10 cases; Amambay 1 case; Canindeyú 140 cases; Presidente Hayes 3 cases; Asunción 16 cases: Most of these cases were reported during January (26 cases); and February (183 cases). From the total, 52% corresponded to male people and 48% to female people. Most of the reported cases were produced as result of poisoning by organophosphate; only one case was reported as poisoning by organ chlorinated.

2.3.1.9 Actions in process

SENAVE – FAO Project

Since 2005 the Government of Paraguay, through SENAVE and with the support of FAO is working with the problem of obsolete existences of Pesticides.

Through these actions the Obsolete Pesticides National Inventory has been finished, Obsolete Pesticides from OFAT Paraguari (Phosphorated, Carbonates and Ace hates) have been exported and eliminated and human resources have been trained in the topic.

The termination of the Inventory provides with a total estimated in more than 5.209 tons of Obsolete Pesticides, seeds of contaminated cotton, contaminated containers and soil.

On this respect, the Project has the following components:

- **Elimination:** whose objective is to eliminate 625 tons of Obsolete Pesticides (including the found POP Pesticides) and material contaminated by sound environmental procedures.
- **Seeds treatment:** the objective is the biological treatment – through the system called Biobed – from the 4.210 tons of seeds of contaminated cotton.
- **Prevention of future accumulations:** through the legal improvement, training, investigation and awareness.

Sound Use and Management of Pesticides Project Canada-Paraguay

Since 2003, the Government of Paraguay, through an Agreement with the Government of Canada, has developed materials for diffusion and training and the development and implementation of Training Programs in different levels (Professionals of the public and private sector, Salesmen, Agricultural Education Centers, Farmers, Consumers, etc.).

2.3.2 Polychlorinated Biphenyl

The identification of the applications in service with PCB content was concentrated on those applications of close systems, mainly transformers and capacitors.

During the process, it was working with the ANDE, which owns approximately 90% of the electrical distribution equipments of the country; at the same time Itaipú Binacional and Yacyretá Hydroelectric Dams, Industries (mainly those which have more than 20 years of function), Health centers and Army Headquarters were contacted.

The collection of data for the elaboration of the preliminary Inventory consisted, in a first stage, of the pre-selection of entities to be evaluated and a later contact with Institutions considered relevant such as:

- Electrical Enterprises (Import companies, Manufacturers and Repairing Companies of electrical distribution equipments, Hydroelectric dams, Electrical stations and sub-stations)
- Industries companies with more than 20 years in function; mainly from the sugar mills sector
- Food Industries companies
- Health Centers
- Army Headquarters

The initial evaluation consists on a set of questions with the purpose of determining possible existences of PCB in the facilities, and the activities associated to its management. The consultations were performed by notes, questionnaires and e-mails.

It is important to highlight at this point, that the level of general respond was very low, mainly from the side of private enterprises and industries; obtaining a greater answer from the electrical generation and distribution sector.

Once the contact was made, meetings with representatives were established with Institutions and 25 Industries, 4 Army Headquarters, 6 Health Centers, 15 Stations and Sub-stations, and the Hydro electrical Centers Acaray and Itaipú Binacional were visited; covering a total of 10 Departments in the national territory and the Capital of the country.

2.3.2.1 Identification of equipments in use

During the visits, the data provided at the beginning were verified and the identification of equipments with possible content of PCB has begun. On this respect, it was continued with a first stage, with the identification of equipments whose plate of fabrication indicates the presence of PCB in dielectric oil.

On the other side, those equipments identified as suspected of containing PCB by the year of manufacturing and the maintenance record were selected for oil sampling and later analysis for testing of Chlorine through the L2000 DX Analyzer equipment, acquired by the SEAM for this purpose.

This type of analytical method may produce false-positive results, since the method assumes that all the chlorinated compounds are PCB, but there are not possible false-negatives results since they indicate absence or low concentration of Chlorine and of PCB as well.

Therefore, if the analysis shows negative results (PCB less than 50 ppm) it is not necessary to do a verification through a different method, but by the contrary, if it shows a positive result, it is necessary a verification through Gas Chromatography.

The sampled equipments consist of:

- Transformers which are out of service temporarily, waiting to be repaired or maintained
- Transformers in use, which installation
- Tanks for oil storage

Due to the country does not count with a Capacity for the performance of Gas Chromatography analysis, the following results presented constitute just a basis for the performance of the National Inventory.

438 appliances in use with contents of PCB were identified, from which, 95,2 % corresponds to electrical capacitors; 3,4% corresponds to potency transformers and reactors, and 1,4 % to distribution transformers. In the following Table the amount of equipment in use are shown and are identified by their type and the Volume of corresponding oil.

Table 9: Identified Equipments in use

Type of equipment	Quantity		Oil (Litres)	
	CC	S	CC	S
Power Transformers and Reactors	-	15	-	105.750
Distribution transformers	4	2	330	240
Capacitors	417	-	8.160	-
Total	421	17	8.490	105.990

CC: equipments identified with content of PCB

S: equipments suspected to contain PCB, identified by Chlorine testing

It has to be emphasized that distribution Transformers which were inventoried and identified as suspected were under repairing and/or maintenance in the cities of Asunción and San Lorenzo; while the power and Reactors equipments are located in the Stations and Health Center I.

On the other side, the Capacitors and distribution Transformers identified by a Plate are located in the Hydro-electrical Central Dam Acaray.

2.3.2.2 Identification of equipments out of service and contaminated material

The identified obsolete equipments correspond to those equipments which are in bad condition and therefore their reparation is not possible but an adequate final disposition is possible.

Transformers as well as capacitors were identified. In the case of ANDE, the obsolete equipments are placed in a temporary deposit in San Lorenzo Station. The Deposit in general is signalized and in good conditions; it has good ventilation and a close drainage system to content linkages.

In this Deposit, the contaminated materials which come from the oil leakage after the explosion of two reactors in the Acaray Power Dam which occurred in 2004 are also storage. In the same Station are also staged outdoors, damaged equipments which are waiting for being repaired whose content of PCB is unknown.

In the Support substation, right side of Itaipú Binational Entity, there are 3 banks of capacitors, each one with 24 Capacitors totaling 72, which according to the technical characteristics they contain isolator oil Dielektrol II (oil suspected of containing PCB). This sub-station was built in 1981 and it is currently out of service, under ANDE administration as an electric power source of the city of Hernandarias.

On the other side, 2 obsolete equipments which contain PCB one in the food industry and the other in the sugar industry where identified. In the first case, the equipment is in good conditions, but was moved out from use for its dechlorination and later reclassification. In the second case, the equipment is in very bad conditions and is deposited in the Industrial company’s facilities.

The existences out of use and contaminated material found are presented in the following Table:

Table 10: Obsolete Existences and contaminated material.

Type	Quantity	Weight (Kg)
Transformers	4	5.025
Capacitors	682	37.032
Contaminated	-	6.081

2.3.2.3 Aspects related to PCB Management

During the collection of data and the performance of training and awareness events related to PCBs, some key aspects have been identified in order to strengthen an adequate management of contaminated equipments and materials.

One of them consists of the necessity to create a regulation or norm which considers all the aspects of the life cycle of that pollutant; in this way, not only an adequate management would be achieved but also it might be count with more detailed and accurate information about the national situation regarding PCBs.

Other important aspect to be considered is the lack of information by the responsible stakeholders (government entities, suppliers, manufacturers, etc.), which derives in a lack of general information for knowing the scope of the problem and consequently an inexistent Planning of preventing and corrective actions.

This point become even of greater importance when is considered the daily risk the workers of possessing companies as well as the near populations and the environment that surrounds them are exposed to.

In **Table 11** the identified associated weaknesses and risks are exposed which correspond to each of the stages of PCBs life cycle.

Due to these aspects, the survey and training activities had been done with more frequency as the collecting data analysis had been developed and different sectors had been involved in the process in a more active and participative way.

It is important to highlight that the information level reached about the existence and management of PCBs in the country does not allow performing a short-term planning about decontamination and/or final disposal, but it does take us to the conclusion that it is of great priority give a continuation to the actions which started during the elaboration of the NIP, about the identification of existences as well as the continuous training of workers and mainly the establishment and implementation of protocols and tools which facilitate a following-up and monitoring of the activities related to this POP.

Table 11: Characteristics of the PCBs life cycle/Associated Weaknesses and risks

Characteristics of the life cycle	Main responsible	Weaknesses	Main Risks
Importation	DNA SEAM Import companies	<ul style="list-style-type: none"> - There is no established procedure for controlling the entry of equipments and dielectric oil. - Lack of Human and Economic Resources to perform controlling and monitoring. - Lack of equipped laboratories and of capacities for sampling and analysis. 	<ul style="list-style-type: none"> - Entry of equipments, scrap metal and contaminated oils
Manufacturing	SEAM Manufacturers	<ul style="list-style-type: none"> - There are no procedures of PCB content verification from the importation or recovered oil. - There is a lack of knowledge of workers about associated damages due to PCBs. - Lack of Human and Economic resources to perform controlling and monitoring. - Lack of equipped laboratories and of capacities for sampling and analysis. 	<ul style="list-style-type: none"> - New equipments contaminated with PCB - Contamination of infrastructure and work materials - Workers exposed to contaminated equipments, oils and materials - Environmental Contamination - Neighboring population exposed to contamination

<p>Use</p>	<p>SEAM ANDE possessors</p>	<ul style="list-style-type: none"> - There is a lack of knowledge of workers about associated damages due to PCBs. - There is no record of equipments history. - Lack of interest and/or lack of knowledge of the equipments owners. - Shortage of Human and Economic Resources to perform a detailed and complete Inventory. - Lack of equipped laboratories and of capacities for sampling and analysis. 	<ul style="list-style-type: none"> - Workers exposed to contaminated equipments, oils and materials - Environmental Pollution - Neighboring population exposed to contamination
<p>Equipments Maintenance and Repairing</p>	<p>SEAM Enterprises of the Area</p>	<ul style="list-style-type: none"> - There are no analysis procedures to detect presence of PCB. - Lack of interest and/or acknowledge from enterprises. - Lack of acknowledge from workers about PCBs associated damage. - Inadequate places for temporary storage. - Shortage of Human and Economic resources to perform controlling and monitoring. - Lack of equipped laboratories and of capacities for 	<ul style="list-style-type: none"> - Cross contamination of equipments - Infrastructure and work materials contamination - Workers exposed to contaminated equipments, oils and materials - Environmental pollution - Neighboring population exposed to contamination

		sampling and analysis.	
Transportation	SEAM MOPC/DINATRAN ANDE Owners	<ul style="list-style-type: none"> - Absence of training to the personnel in charge of transporting hazardous substances. - Absence of security and emergency equipment inside the transport units. - Shortage of human and economic Resources to perform controlling and monitoring. 	<ul style="list-style-type: none"> - Terrestrial transportation accidents/Leakages - Environmental pollution - Transport workers exposed to contaminated equipments, oils and materials - Neighboring population exposed to contamination
Re-classification / Final Disposal / Elimination	SEAM ANDE owner DIGESA	<ul style="list-style-type: none"> - Lack of trained staff in managing hazardous wastes. - Absence of Infrastructure at a national level to treat or eliminate PCB - Shortage of human and economic Resources to perform an adequate control and monitoring of final disposition and/or elimination of stockpiles. 	<ul style="list-style-type: none"> - Pouring to the environment of contaminated oil - Inadequate Reusing and /or illegal disposition of contaminated equipments - Workers, re-sellers, exposed to contamination - Environmental pollution - Population exposed to contamination

2.3.2.4 Actions in process

ANDE

Works performed by ANDE in the Project framework show an increased interest of the Entity respecting the appropriate management of contaminated equipments and sites as well as in the institutional strengthening for activities concerning the equipment Inventory, mainly the sampling and analysis, as well as other internal management such as maintenance and repairing operation, temporary storage of damaged equipments, transportation, etc., and obviously the workers training.

The awareness level of top officers is also greater and the realization of an adequate PCB Management Plan at an institutional level has been prioritized.

Some of the actions that were carried out in the last year were:

- The creation of the PCB Committee with representatives from the sectors of Security, Environment, Maintenance and Repairing of Transmission and distribution Equipments, Transportation, Accidents and leakages, Storages Administration, that is already working in the definitions of activities for the equipments Inventory, the coordination of training activities, and support in computing systems.
- The Committee is also elaborating a Working Plan, in which the identification of necessities is considered in relation to infrastructure analysis, storages, fitting up of maintenance and repairing infrastructure facilities.
- At the administrative level, it is in process of approval an internal Resolution, through which certain security norms are established for handling, storage and transportation of equipments that might be contaminated with PCB
- The Institution is also developing some procedures for sampling and decontamination of the Machine Room II in the Acaray Station, area affected by the explosion of Reactors in 2004

On the other hand, a loan signed by the Government of Paraguay and the IDB, being the executive entity ANDE, contemplates some modernization actions of the Institution which includes the environmental liabilities management. In this context, the following actions have been foreseen:

- The fulfillment of a partial inventory of 3.500 equipments where those distribution equipments located in high rate of population density were prioritized
- Strengthening capacities of sampling and analysis of oil.

At the present, the Institution contemplates among its exigencies regarding outsourcing activities of equipments purchasing and repairing, the certification of no PCB contaminated for the dielectric oil. This point has been generated interest from companies related to this sector, in obtaining a more expanded capacity regarding the PCB Management in order to adequate its procedures and assure appropriate management practices of dielectric oil in repairing and maintenance operations.

SEAM

As part of the legal strengthening concerning the PCB management, a Resolution on PCB management was elaborated, which responsible for its observance will be the SEAM. It contemplates regulations about the different aspects of the life cycle of this pollutant.

The SEAM foresees for the year 2008 the creation of a Department for Managing the Chemical Substances from where activities of control and monitoring for PCB management will be carried out.

On the other hand, and in order to strengthen the PCB National Inventory, covering different sectors, the SEAM will implement the “Declaration of close circuit application that might contain PCB”, in the framework of the Law 294/3, specifically in the Basic Environmental Questionnaire, which constitutes the beginning of the administrative paperwork for obtaining the Environmental License for different types of activities (agricultural, livestock, industrial and of services).

In the elaboration framework of PNI, Awareness and Training activities were carried out about PCB management and its effects, but they reached level is still low, people are working in coordination with the Centro de Producción Limpia-CPL (*Clean Production Center*) from the Paraguayan Industrial Union (UIP), in a Training and Awareness Planning at a national level addressed to owners, manufacturers, importers and repairing offices.

2.3.3 Accidental Emissions

At the present, there are two Inventories of Dioxines and Furans emissions at a national level which correspond to years 2002 and 2005. The applied methodology is based on the “Normalized Instrument for Identification and Quantification of Dioxines and Furans releases” published by UNEP- Chemical Products, inside the framework of the Institutional Program for an Adequate Management of Chemical Products.

Through the use of the Instrumental the main activities generating Dioxins and Furans were identified, grouping them according to recommended specifications mentioned within it, and finally the releases were quantified using the databases about emission factors already provided. Emissions are presented in grams of toxicity equivalents (EQT) per year. The basic equation applied is as follows:

$\text{Annual Emission} = \text{Emission Factor} \times \text{Quantity of processes or produced material}$
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2.3.3.1 Results of Inventories 2002 and 2005

In our country, the activities which generate the greatest emissions of Dioxines and Furans to the environment are those which mainly involved processes of wastes incineration and burning.

The total emissions for year 2002 were estimated in 155,8 g EQT/year while for 2005 the estimations resulted in a considerable increase, being the total of 256,9 g EDT/year.

In the following Table are expressed in a comparative way, the total amount of estimated emission by Category, according to was proposed in the Instrumental, for both years:

Table 12: Total Emissions by Categories for years 2002 and 2005

Nr.	Category	Year 2002 g EQT/year	Year 2005 g EQT/year
1	Waste incineration	3,521	69,902
2	Ferrous and non ferrous metals Production	1,524	1,908
3	Energy and Heating Generation	3,702	3,045
4	Mineral products Production	1,13	0,797
5	Transport	0,365	0,420
6	Uncontrolled combustion Processes	145,75	127,872
7	Chemical products and consuming goods Production	0,0021	0,0002
8	Various	0,249	0,261
9	Disposition /sanitary filling	0,169	4,66
10	Possible hot spots Identification	-	48,112
TOTAL		155,8	256,9

In general, differences in the emissions are shown from one Inventory to other, but principally the difference is given in the waste incineration, and specifically in activities related to hospital wastes incineration, where there is an increase of 95% in emissions to the atmosphere, due mainly to the use of obsolete technologies, without treatment of gases out and the lack of application of criteria in the integral management of wastes generated in the Centers for health care.

On the other hand, the uncontrolled combustion processes continue representing a great contribution for the emissions of these pollutants, and in this Category the principal generating activity constitutes the open-air burning of urban solid wastes, common practice in the dumps along the whole country. It is also a contribution (of 33% in the year 2002 and of 40% in 2005, to the air) the agricultural wastes burning, mainly the cotton stubbles.

Other aspect to be considered is the emission of Furans through equipments which contain PCB. The emission in product reaches 48 g EQT, where the equipments with PCB represent almost 100% of the total amount. It has to be emphasized that meanwhile the equipments are in good order, that means, without leakages, Furans releases will not be produced (and PCB) to the environment. But at the moment the leakages are produced, these pollutants will be release to the surrounding that means, soil, surfaces and sediments.

In the following Table the estimations are presented by Category and emission means for the year 2005:

Table 13: Emissions means by Category

Nr.	Category	Emission (g EQT/year)				
		Air	Water	Soil	Product	Waste
1	Wastes Incineration	69,394	0,000	0,000	0,000	0,508
2	Production of ferrous and non-ferrous metals	1,872	0,036	0,000	0,000	0,000
3	Generation of energy and heating	2,212	0,000	0,000	0,000	0,833
4	Production of mineral products	0,797	0,000	0,000	0,000	0,000
5	Transport	0,420	0,000	0,000	0,000	0,000
6	Processes of uncontrolled combustion	56,119	0,000	8,786	0,000	62,967
7	Production of chemical products and consuming goods	0,000	0,000	0,000	0,0002	0,000
8	Various	0,030	0,000	0,000	0,231	0,000
9	Disposition /sanitary fillings	0,000	0,199	0,000	0,000	4,461
10	Identification of possible hot spots	0,000	0,000	0,000	48,112	0,000
TOTAL		130,844	0,235	8,786	48,343	68,769

The greatest percentages correspond to the emission into the air with 51% and the emission with the wastes with 27%. The emission in products due mainly to category 10; is of 19%. In a smaller proportion, we have the emission in soil with 3%, followed by emissions to water of approximately 1%.

The greatest estimated emission was into the air and totalizes 131 g EQT, where the controlled incineration contribute in 53% to the total emissions into air, being the incineration of solid hospital wastes the contribution of greatest incidence. The uncontrolled combustion represents 43% of total emission to the component air.

On the other hand, the total emission of Dioxines and Furans during 2005 in wastes was of 60 g EQT, where the main contribution is due to the uncontrolled combustion corresponding to wastes burning and accidental fires, representing 92% of the total wastes emissions.

2.3.3.2 Priority Categories / Identified Activities

Even though in the previous point the Categories of greatest contribution to the Dioxins and Furans emissions were identified, in the following Table, the activities identified as the main sources of emission during the elaboration of the National Inventory are presented, year 2005, and the practices and technologies that led to the obtain results.

Table 14: Identified Activities / Practices and Technologies

Activity	Practices and Technologies
Hospital waste management	<ul style="list-style-type: none"> - The more common treatment and disposition methods for these wastes are incineration or pouring in garbage dumps - There are functioning incineration Ovens for hospital wastes obsoletes or in bad conditions, without any control on the atmosphere pollution - Alternative Technologies for Incineration are presented in very few cases - There is no regulation about atmospheric emissions; therefore there is not an adequate control on it. - There are very few initiatives in Hospitals and Health

	Centers focusing on the generation reduction
Urban Solid wastes management	<ul style="list-style-type: none"> - The lack of resources, plus the absence of follow-up activities by the municipal authorities take to an unsustainable management of solid waste, from the generation itself to the final disposition - The separation and collection of recycled material is in most of the cases in charge of an informal sector called <i>gancheros</i>(punchers) - There are deficiencies in the collection and transport service - Only 2 municipalities have Sanitary Landfills - The practices of wastes burning in dumps is common in most of the municipalities - There is a lack of acknowledgement by the population about risks associated to waste burning - Due to an inefficient collection system, part of the population pour its wastes on the streets in rainy days o they burn them in their yards, waste lands or in some cases on the sidewalks
Burning of Agricultural, grass and forest Wastes	<ul style="list-style-type: none"> - The practice of burning agricultural wastes is very common at a country level, mainly of the cotton wastes_stubble to combat some kind of insects <i>picudo</i> (<i>insect found in the cotton plants</i>) - Grass burning is characterized by being a livestock activity for grass renovation - Forests burning, even it is increased in draughts periods, it is a practice that it occurs mainly in an intentional way.

2.3.3.3 Actions in process

From this points, it has to be highlighted that the “Manual of Integral Management of Municipal solid Wastes”, was elaborated, which is a tool to facilitate the management and sustainability of plans which keep relations with the management of solid wastes of the community.

This manual provides the municipalities, that because of the Law, are responsible of the management of Municipal solid Wastes, guidelines to be able to sustain certain points of the components from the integral management and that they have continuity.

With this manual, it is expected that the municipalities start implementing gradually the different points of the management pyramid of the RSU (Reduction – Reutilization- Recycling- Final Appropriate Disposal) with this it will get the reduction of the activities of open-air burning or the volume of burnings in dumps.

On the other hand, the guidelines of the National Policy of the Management of Solid Wastes are being elaborated, might be urban and/or danger, document that has to be approved by the CONAM for its later broadcast or implementation.

2.3.4 Contaminated Sites with POPs

A work methodology of four stages was used to identify potential contaminated sites which are described as follows:

2.3.4.1 Identification

In this first stage, sites where a register of planned or accidental activities considered as potentially contaminating existed were identified. Locations and areas where past and present activities that could originate environmental contamination, as well as POP-related health effects, were also identified

2.3.4.2 Activity Analysis

In this stage, a preliminary analysis of the previously mentioned activities was performed in order to qualify the sites as “Potential POP Contaminated Sites” (SPC) or as “Non POP Contaminated Sites.”

Thus, the following points or areas were considered as SPC:

Sites where important accidents occurred:

- OFAT
- Acaray Hydroelectric Dam

Sites where deposits related to POP have existed:

- IAN: Storage of agricultural chemicals
- Itaipu Binational Hydroelectric Dam Right Margin, Capacitor Bank
- Itaipu Binational Hydroelectric Dam Left Margin, Temporary PCB Warehouse
- Temporary PCB Warehouse San Lorenzo Station

Sites where practices that could originate POP contamination were performed:

- Final disposal dumping grounds of municipal solid residues
- Medical waste incinerators

2.3.4.3 Preliminary Evaluation

Technical data on the SPCs listed in the previous item was retrieved and consisted of the following:

- Verification of previously given data, mainly use conditions, chemical management, and hazardous solid residue management
- Request of documents that validate information given previously by the institutions under discussion
- Identification of sample points with environmental matrixes

2.3.4.4 Environmental Characterization

At this stage, an analysis of possible POP concentration in the environment was performed in order to identify the degree of contamination.

Even though superficial soil analyses have been performed on potential PCB contaminated sites, they are not conclusive because of the L2000 DX chlorine testing method. It is necessary to perform analyses in depth by means of chromatography testing.

2.3.4.5 Identified Potential Contaminated Sites

Following is a brief description of the identified SPCs according to the classification used in item 2.4.3.2:

2.3.4.5.1 Sites where important accidents occurred

OFAT

In July 2003, there was a fire in the Cotton and Tobacco Superintendence – OFAT, subordinate to the MAG, where pesticides and agricultural chemicals of the phosphorus family, acephate pyrethroids and carbonates, agricultural tools, fertilizers and other items were stored. It is important to mention, as was referred in **2.3.1.5 Obsolete POP Pesticides**, that empty DDT and Mirex containers are stored in the site.

The fire was considered a serious accident due to the presence of stored hazardous chemicals. It contaminated the soil, water and air with a toxic cloud. According to the samples extracted by CETESB – Brazil employees, COV levels were high. Dioxin and furan emissions were not analyzed, but according to bibliographic data it is very possible these contaminants were produced.

Acaray Hydroelectric Dam

In April 2004, two reactors exploded and caused the leakage of considerable volumes of PCB-containing oil. The accident was properly contained by the CBVP, but contaminated the reactor structure and, though the explosion did not produce any fire, it presumably generated furans, which are highly associated to this type of disasters.

The degree and scope of the contamination and the decontamination procedures using nanotechnology are expected to begin in the first trimester of 2008.

2.3.4.5.2 Sites where deposits related to POP have existed

IAN

The IAN warehouse, which is located in the department of Cordillera and where 300 kg of chlordane were found, does not comply with required storage conditions. Product dispersion could also be seen, contaminating not only other products, but infrastructure and the environment as well, and affecting public health.

Itaipu Binational Hydroelectric Dam – Temporary PCB Warehouse

On August 26, 1998, the Itaipu Binational Hydroelectric Dam shipped 6,530 kg of polychlorinated biphenyl contaminated products. The residue was sent abroad to be incinerated and consisted of:

- 9 oil drums
- 7 empty drums
- 16 drums for solids

These were properly stored and labeled in a warehouse located on the left margin of the dam and sent to Wales to be incinerated.

A soil study of the storage area is necessary to discard possible contamination during the residue transport process and the storage time period.

Itaipu Binational Hydroelectric Dam - Capacitor Bank

Three capacitor banks, each with 24 capacitors for a total of 72, are found in the support substation on the right margin of the Itaipu Binational Hydroelectric Dam. According to technical characteristics, these capacitor banks contain Induclor II isolating oil. The substation was mounted in 1981 and is currently deactivated. It was used by the ANDE as an electric energy feeding source for Hernandarias.

It is considered an SPC due to the possible existence of capacitor oil leakages.

San Lorenzo Station Warehouse

The San Lorenzo station is in an urban area, 11 kilometers from Asuncion, where contaminated material from Acaray dam, as well as other PCB-containing equipment, is there in a temporary warehouse.

Even though the warehouse is in good conditions and complies with storage standards referring to construction, ventilation, signal systems and security equipment, it is necessary to perform a soil study of the storage area and its surroundings in order to discard the presence of PCB.

2.3.4.5.3 Sites where practices that could originate POP contamination were performed

Cateura landfill – Municipal dumping grounds

The Cateura landfill has been identified as an SPC due to the generation of leachate, which is produced by organic waste decay and wire burning, performed by garbage recyclers in the landfill area in order to recycle copper. This practice generates dioxin and furan emissions.

A common waste volume reduction practice in municipal waste dumping grounds is the burning of garbage in the open without any emission controls. In fact, 123

municipalities burn municipal residue, and location and population vulnerability factors are important in evaluating its effects on the areas close to RSU final disposal sites.

Medical waste incinerators

The National Hospital of Itaugua is considered an SPC as well. Medical waste generated in Asuncion health centers are treated here in incinerator ovens that do not comply with Stockholm Convention guidelines, specifically regarding the management of released gases, which are directly emitted to the atmosphere without any treatment.

2.3.5 Current level of information, awareness and education

Since the start of the project, different communicative, awareness-raising and training activities have been performed in order to inform and educate the population and key community figures about POPs and the PNI. In this way it is possible to be informed about national levels of awareness and understanding of the matter.

The actions were proposed in different stages and by different aim groups. These groups have approached the activities with more interest in the last few months.

Workshops and training and awareness-raising conferences, accompanied by informative material on POPS, the Stockholm Convention and the PNI, are the main components of the strategy that has been used.

The activities which have been performed are briefly described next:

2.3.5.1 Awareness-raising activities

These consisted of communicative and awareness-raising workshops and were given in different locations nationwide, including 12 departments of the Eastern region and the capital.

The priority aim groups were composed of:

- Representatives of involved public organizations
- Teaching staff / educators
- Health sector workers
- Community organizations
- Students
- Communicators

The workshops consisted of presentations on POPs and the Stockholm Convention, and of the actions performed and projected in the framework of the elaboration of the PNI. Participants were organized in work groups in order to analyze activities related to POPs in their communities, propose actions, and identify those who are responsible and possible obstacles.

The activities were mostly led by the project coordination and executed together with the Department of Non-transmissible Diseases of the MSP & BS and the NGOs Alter Vida and RAPAL Paraguay.

In general, the following can be concluded:

- The level of information found in all aim groups is low, including that of professionals related to technical and health areas
- Garbage burning in the open, the indiscriminate use of pesticides and lack of information on the subject are the subjects that worry the population of the visited locations the most. In specific communities there was concern in incineration (medical doctors) and industrial contamination activities
- After the execution of the activities, the communities started working on actions, specifically on training and awareness-raising. The project coordination was mainly contacted to perform specific training
- The above-mentioned indicates that a high level of information on the subject does not exist or that the information has not yet reached a vast percentage of the population. Despite this fact, the interest and concern of the main representatives of the visited communities have grown and is of the utmost importance in order to continue with the generated processes.

2.3.5.2 Educational and training activities

Educational and training workshops were given at different levels and in different locations of the country. Many of them were performed with the assistance of the CNC, while others rose at the request of previously visited communities.

The aim groups were mainly composed of direct representatives of the governmental sector, as well as private and civil sector representatives.

The activities were led by the project coordination, but also relied on training by international experts in PCB and action plan elaboration.

In general, the level of education regarding POPs has grown considerably in comparison with the start of the project. Several inward actions that are being performed by the institutions are proof of this. It is believed that the professionals who have received training throughout this process have the necessary tools to train other human resources in their institutions and continue advancing with the project.

2.3.5.3 Awareness-raising and communicative tools

Different communicative tools containing information related to POPs, the Stockholm Convention and the PNI have been elaborated in the framework of the project. These mainly consisted of information cards, brochures and booklets. These materials were distributed in the activities mentioned above.

On the other hand, a web page on the project has been designed and implemented - www.pnicop.gov.py - in order to inform the population of its conceptual framework and the actions performed throughout the elaboration of the PNI.

As part of the information strategy, a POP database has been designed, which is currently being implemented, in order to digitally file national inventory and future data. The database will generate public reports in order to inform the population on the current POP situation and will be published on the project web page and later printed to reach a greater audience.

Finally, an audiovisual educational material on POPs and the Stockholm Convention is being elaborated in coordination with the Department of Environmental Education of the SEAM to be used during public events and broadcast on radio and television.

2.3.5.4 Actions in process

As part of the elaboration and execution of the national plan, an awareness-raising and communications subcommittee has been developed in the CNC. This subcommittee has promoted the formation of a lead group composed of governmental representatives (ASANED, MDN, MEC, SEAM), non-governmental representatives (NGOs Alter Vida, Survival, ROAM, WWF Paraguay) and small and medium-sized company and industrial representatives (Clean Production Center – UIP) so that leading institutions and organizations with more knowledge on the subject can continue with the activities, promote interinstitutional coordination and start the implementation of actions proposed by the PNI.

One of the more prominent activities performed together with the Curriculum Department of the MEC is the elaboration of educational material in order to incorporate POPs, adequate chemical management and sound environmental practices to public, subsidized and private school curriculums.

The educational material consists of:

- A teaching staff guide (elementary and high school education)
- An educational pamphlet for children
- An educational pamphlet for young people

The educational materials will have been evaluated and published before the start of the school year in February 2008 through teacher training activities.

The incorporation of these materials to the elementary and high school curriculum is expected for the first trimester of 2008.

On the other hand, a newspaper campaign strategy is being developed in order to educate the population on prevention and sound environmental management.

A curricular program based on the activities in the fight against POPs is also being developed together with the Catholic University:

- A degree on Health and the Environment, including a unit on POPs and chemicals
- University extension programs on health and the environment for vulnerable, POP-affected or potentially affected communities
- Radio interactive broadcasts on health, the environment and PNI advances

Awareness-raising material for local leaders and municipalities, as well as regulative chemical guideline policies, are being developed through the lead group and technical Congress committees.

2.3.6 Activities related to non-governmental groups of interest

The pertinent activities performed by NGOs, identified during the PNI elaboration, are concentrated principally in the diffusion or broadcasting of the information and realization of broad participation events.

Even though the NGOs RAPAL Paraguay and Alter Vida have been performing during several years a follow-up of the issue related to POPs, particularly to Pesticides POP, and currently both are represented in the CNC; it is considered necessary to foster the realization of activities which involve different sectors of the population in coordination with governmental entities, in order to join forces in the elaboration of information materials as well as in the strategy of communication and awareness.

The principal activities performed by Alter Vida and RAPAL Paraguay during the years 2006 and 2007 are briefly described as follow, some of them in coordination with other NGOs, governmental entities and associations from the community:

Elaboration and publication of informative materials

A brochure with basic information on POPs and the Stockholm Convention has been elaborated. So the population can better access it, the brochure was written with subtitles in Guaraní, which, together with Spanish, is the national language of Paraguay. The format and drawings were conceived with the same criterion.

Other materials such as the “Participation of the public in the Stockholm Convention,” videos and CDs containing experiences from other countries in the fight against POPs were distributed in workshops.

A considerable number of documents have been made available to the visitors of the Alter Vida web page in order to facilitate information exchange and obtain data from activities and workshops. More documents have been given to health sector representatives as well.

Performance of events

Diffusion Workshops were carried out with different sectors like the municipalities, from the capital area as well as from the metropolitan area and also with the academic institutions and some of the popular organizations such as the Pre-Cooperative of Cateura Dump Recyclers (*Pre-Cooperativa de Recicladores del Vertedero Cateura*).

On the other hand, some events with international participation were performed such as the Workshop about “Citizen Participation in the Stockholm Convention” and the workshop RAPAL – MERCOSUR “Situation of Persistent Organic Pollutants – POPs and High dangerousness Agro-chemicals related to International Conventions of Stockholm and Rotterdam”.

2.3.7 Technical Infrastructure for evaluation of POPs

2.3.7.1 Monitoring and Analysis Capacity

The evaluation of infrastructure and human resources eligible for POPs analysis and monitoring in the country, lead us to identify this area as one of the priorities at national level, since in general an increasing interest has been noticed about this issue but also about insufficient technical and financing resources.

The main Departments depending on the Ministries in charge of this management do not have the necessary infrastructure, showing in general a lack of information about the scope and level of contamination and affections to health that likely to exist in the country with respect to POPs.

Therefore, and due to what was mentioned in previous paragraphs, there is no control over the different aspects of the life cycle of the chemical products listed in the Stockholm Convention; some of them are already prohibited in the national territory.

On this respect, during the year 2007, it has been working with different laboratories (public, private and university) in an evaluation of the needs found in all cases and which would be the aspects to be strengthened in order to initiate an adequate management which are:

- Ad equation or acquisition of equipment and infrastructure
- Adoption of norms
- Accreditation

It is important to stand out that in the private sector there is a Laboratory which is in process of performing analysis of PCB in blood and urine, and at the same time is generating the conditions for the realization of PCB tests in oil as well as in environmental matrices.

On the other hand, the Laboratory inaugurated recently by SENAVE constitutes other important advance that might carry an adequate monitoring of quality of Pesticides in the whole life cycle.

2.3.7.2 Risks research and assessment

At country level, there are not studies about the risks associated to POPs. Even there were initiatives such as studies performed at the beginning of the 90s (Section Pesticides POP), these did not have an appropriate following-up from the Institutions involved in the management of POPs.

So, since the year 2000, the National Center of Toxicology was created and since August 2003, the Vigilance Department of Not transmittable Diseases were involved more actively in the management of pesticides intoxication cases. Up to now, the work that both institutions of the Ministry of Health have performed about intoxications was not able to segmentate or specifies the information related to organoclorinated. It is important, therefore to potentiate the Health Vigilance Centers and to modernize the CNTOX.

3 Strategy and Elements of the Action Plan of the NIP

3.1 Policies Declaration

Paraguay, being the signatory country of the Stockholm Convention, and through the approval and ratification of the same by the National Law, commits itself through this National Plan to adopt measures suggested in the National Policy and commits to perform actions and to take the measures to assure the elimination and/or reduction of the POPs.

The proposed actions in this Chapter correspond to agreed-by- consensus works performed between Institutions for the governmental and private sector, and NGOs. From the year 2006 it has been working with the CNC and external Counselors, in the elaboration of what it is called the National Objectives and Priorities from where actions proposals were elaborated to be implemented in order to fulfill with the commitment assumed by the country at signing and ratifying the Stockholm Convention, as well as to meet the Objectives of the National Environmental Policy of guaranteeing an environmental, economic and socially sustainable, equal and participative life quality for the current and future population.

For the determination of priority actions the following aspects were taken into account:

- **Situation of POPs in the country:** the National Inventories carried out under the framework of the PNI Paraguay Project were evaluated, identifying the potential contamination sources and risk for health and the environment.
- **Evaluation of National Capacities:** the aspects related to the Legal Framework, Institutional Capacity for management of POPs and the existing Analytical Capacity were evaluated
- **Socio-economic Evaluation:** the socio-economic impacts generated by the present management related to POPs were evaluated.
- **Level of training and awareness of the citizenship:** the activities of awareness, broadcasting and training performed under the PNI elaboration framework were evaluated, taking into account the level of previous information to the activities and the level of existing interest in different areas of the country and groups of interest.

This is the way the following National Objectives were established and the lines of priority action:

General Objective:

To adopt adequate Management measures to eliminate and/or reduce the POPs in Paraguay, in order to protect human health and environment.

Specific Objectives:

- To develop and strengthen the national capacities necessary to implement and adequate POPs management
- To reduce the Dioxins and Furans releases into the sources of greater incidence resulting from the National Inventory, through economically viable and socially acceptable measures

- To identify and eliminate the existences of Polychlorinated byfenils at a national level, through and environmentally adequate management of them
- To generate sanitary and environmental conditions adequate for the disposition and elimination of Obsolete Pesticides POP
- To identify and correct the places contaminated by POPs
- To develop and effective and continue strategy of information, awareness and training for the citizenship about the POPs and the Stockholm Convention.

Priorities Action Lines:

- Strengthening of national Capacities for POPs management
- Environmentally adequate management of Urban Solid Wastes and Hospital Wastes
- Ending of National Inventory of PCB and elimination of identified existences
- Environmentally adequate management of POP Obsolete Pesticides
- Identification and prioritization of places contaminated with POPs
- Continuous and effective information and awareness to the Paraguayan population

3.2 Execution Strategy

To achieve the implementation and following-up of the proposed activities for each of the priority lines, it is considered necessary the creation of a Technical Unit of POPs Management as part of the Strategic Planning Department of SEAM. This sector should have the function of coordination of actions derived from the PNI as well as the harmonization and data updating related to POPs.

On the other hand, the enlargement of NPC functions was proposed to be established as the National Committee for POPs Management (CNGC), whose principal function will be to do the following-up to the implementation of what was proposed in this Plan, as well as the activities planning and diffusion.

Finally, it is considered important to appoint CONAM the function of actions evaluator, due to the fact that it is integrated not only by all sectors of interest but also coved the departmental and municipal governments.

In a preliminary way, a revision and evaluation of PNI on a yearly basis by the above mentioned entities. These evaluations will constitute the bases for the preparation of reports to the Conference of Parties according to established terms.

3.3 Activities, strategies and action plans

3.3.1 National Capacity for the implementation of proposed measures in the NIP

During the elaboration of the NIP, and as it was described in previous chapters of the present document, the National Capacity about POPs management in different sectors of interest for each family of chemical substances established in the Stockholm Convention.

As result of this evaluation, it is considered necessary, firstly, to obtain a strengthening of the legal framework related to POPs, of the institutional management at an internal and external level, of the analysis capacity at the national level and of the intra-institutional information systems and of public nature.

With the following proposed activities, it is pretended to achieve at a national level the national capacity necessary to perform an adequate following-up to what was proposed in the PNI and to turn these actions into a sustainable environmental and economic solution in our country.

General Objective	Specific Objectives	Main products	Responsible institutions
<p>To develop and strength the national capacities necessary to implement and adequate POPs management</p>	<ul style="list-style-type: none"> - To develop and foster appropriated and strengthened legal tools to achieve what was disposed in the Stockholm Convention - To create and strength management units of POPs in the involved Institutions - To create and strength the analysis national capacities for monitoring and control of POPs - To develop and implement an Information System about POP, intra-institutional as well as public coverage, for monitoring the activities related to the implementation of the NIP 	<ul style="list-style-type: none"> - Up-dating and strengthening of the environmental legal framework related to POPs - Management Units of POPs in involved institutions - POPs Analysis Capacity in different matrixes - Implemented Intra-institutional and of public diffusion System 	<p>CNC / SEAM / INTN / ONA / NGOs</p>

Proposed Activities	Achievement Indicators	Means of Verification	Responsible Institutions
1.1 Elaboration, diffusion and application in a agreed way of reforms to the environmental legal framework related to the POPs management			
1.1.1 To elaborate an agreed proposal of reforms to the environmental legal framework related to the POPs management.			
<p>To elaborate a reform proposal to the legal framework, related to the POPs management, which might include the following:</p> <ul style="list-style-type: none"> – The updating, strengthening and Resolutions and Laws projects related to POPs – The legal tools inclusion that are considered necessary for the national Management of the POPs – Well defined Protocols of application, specifying responsibilities and clear roles for the different institutions related to the POPs Management <p>To present the proposal before the NPC for the evaluation and approval of it</p>	<p>Proposed Reforms / Nr. of Analyzed existing Resolutions and Laws</p> <p>Proposal of new Laws and/or Resolutions</p> <p>Protocols of defined application / Nr. of analyzed Resolutions and Laws</p> <p>Defined Roles and responsibilities / Nr. of analyzed Resolutions and Laws</p> <p>Legal foundation and exposition of reasons</p> <p>Comments, modifications and recommendations performed by the CNC</p> <p>Agreed by consensus and finalized Proposal</p>	<p>Reports about the advances of the hired consultants</p> <p>Reports about Meetings maintained with CNC Representatives</p> <p>Agreed Proposal of reforms and new Resolutions, finished and printed</p> <p>Agreed Proposal of reforms and New laws finished and printed</p>	CNC / SEAM
1.1.2 To submit the proposal to the pertinent authorities for its evaluation and later approval			
<p>To present and discuss the proposal to reforms and/or new Laws before the National Congress for its evaluation and approval</p> <p>To present and discuss the proposal of reforms and/or new Resolutions before the Ministries related for its evaluation and approval</p>	<p>Proposal presented before the National Congress and its respective Chambers</p> <p>Proposal presented to related Ministries</p> <p>Approval by the pertinent authorities</p>	<p>Reports of Meetings maintained with the representatives of the Legislative Chamber and representative of the related Ministries</p> <p>Proposal of reforms and new Resolutions already finished, approved and printed</p> <p>Proposal of reforms and new Laws finished, approved and printed</p>	CNC / SEAM

Proposed Activities	Achievement Indicators	Means of Verification	Responsible Institutions
1.1.3 To broadcast and apply the reforms and/or new Laws and Resolutions approved			
<p>To broadcast the reforms and/or new Laws and Resolutions at an internal level in related Ministries</p> <p>To train public officers from related Ministries based on the modifications, roles and responsibilities established in them</p> <p>To broadcast the reforms and/or new Laws and Resolutions to the population</p>	<p>Elaboration and broadcasting of materials which contain information about reforms and/or new Laws and Resolutions</p> <p>Elaboration and broadcasting of procedure manuals with defined roles and responsibilities</p> <p>Training Talks /Workshops for public officers</p> <p>Publishing of reforms and/or new Laws and Resolutions through massive communication means</p>	<p>Printed and broadcasted information Materials</p> <p>Printed and broadcasted Procedures Manuals</p> <p>Information about Talks / Training Workshops /Participants lists / Issued Certificates</p> <p>Written press and Internet articles / Audio and television materials</p> <p>Documents about approved reforms available to public (printed and digital)</p>	CNC / SEAM
1.2 Elaboration and broadcasting of sustainable National Policies related to the POPs management			
1.2.1 To elaborate an agreed proposal of sustainable National Policies related to POPs Management			
<p>To elaborate a National Policy about the Integral Management of chemical substances in their whole life cycle, as part of the National Environmental Policy and International Conventions guidelines</p> <p>To elaborate a National Policy for an Integral Management of Solid Wastes as part of the National Environmental Policy and International Conventions guidelines</p> <p>To present proposals before the CNC to evaluate and approve them</p>	<p>To put forward a Sustainable National Policy Proposal for an integral management of chemical substances</p> <p>Proposition of a sustainable National Policy of integral Management about Solid Wastes</p> <p>Comments, modifications and recommendations performed by the CNC</p> <p>Agreed by consensus and finished Proposals</p>	<p>Advance Reports about the elaboration proposals</p> <p>Agreed Proposal of the National Policy about Integral Management of Chemical substances</p> <p>Agreed by Consensus Proposal of National Policy about integral management of solid wastes</p>	CNC / SEAM
1.2.2 To elaborate CONAM proposal for its evaluation and later approval			
<p>To present and discuss the proposal for the National Policy about the Integral Management of Chemical Substances</p> <p>To present and discuss the proposal of the National Policy of solid Wastes</p>	<p>Proposals presented to the CONAM</p> <p>Approval by the CONAM</p>	<p>Meetings reports maintained with the CONAM</p> <p>National Policy Proposal about the Integral Management of Chemical Substances approved by the CONAM, and printed</p> <p>National Policy Proposal about an Integral Management of solid Wastes approved by the CONAM and printed</p>	CNC / SEAM

Proposed Activities	Achievement Indicators	Means of Verification	Responsible Institutions
1.2.3 To submit the proposal to the National Congress for its evaluation and later approval			
To present and discuss the proposal of the National Policy about an Integral Management of Chemical Substances	Proposals presented before the National Congress	Reports of Meetings maintained with the Congress National Policy Proposal about the Integral management of Chemical Substances approved by the Congress and printed	CNC / SEAM
To present and discuss the proposal of the National Policy about an Integral Management of Solid Wastes	Approval by the National Congress	National Policy Proposal about the Integral Management of Solid Wastes approved by the Congress and printed	
1.2.4 To broadcast the sustainable National Policies related to the POPs Management			
To broadcast the National Policies approved at institutional and public levels	Elaboration and broadcasting of materials containing information about the National Policies Publication of National Policies through Talks and/or Workshops to the different stakeholders Publication of National Policies through massive means of communication	Printed and broadcasted Informative materials Talks / Workshops Information / Diffusion of Workshops / Participants lists / Certificates issued Written press and Internet Articles / Audio and television Materials	CNC / SEAM
1.3 Creation and/or Strengthening of POPs Management Units inside the related institutions			
To create POPs Management Units inside the different involved departments of related Institutions	Functioning of the Management Units in different departments	Reports about the creation of different Management Units Reports and Nr. of Talks / performed Workshops / Participants Lists / Issued Certificates Implementation Report of the Cadastre Systems Sustainability Plans for the Management Units, approved and printed	CNC / SEAM
To develop and implement Training Programs for Human Resources about POPs Management along their life cycle	Trained Human Resources operating inside the established Management Units		
To implement and/or strength Sanitary and Environmental Vigilance related to POPs	Established Cadastral Systems of data, exposition levels and derived effects in populations and natural means		
To elaborate Plans of sustainability for the different POPs Management Units	Planes de sustentabilidad / N° de Unidades de Gestión en funcionamiento		

Proposed Activities	Achievement Indicators	Means of Verification	Responsible Institutions
<p>1.4 Creation and/or Strengthening of Analytical Capacities of POPs</p>			
<p>To adopt and equal international regulations of POPs analysis</p> <p>To establish protocols for the POPs samplings and analysis in different matrixes</p> <p>To train Human Resources of the public, university and private Laboratories about sampling and analysis of POPs</p> <p>To perform analysis studies of Cost-Benefit to strength the infrastructure of public and university Laboratories which facilitate the control and monitoring tasks of POPs at a national level</p> <p>To acquire and/or adapt equipments and reagents necessary for the strengthening of infrastructure</p> <p>To design and implement a Support Plan for accompanying of the processes of infrastructure adaptation and evaluation of Laboratories for their accreditation in POPs analysis</p>	<p>Norms or regulations endorsed by the INTN</p> <p>Protocols of finished sampling and analysis of POPs</p> <p>Human Resources in the public, private and university areas, prepared for performing POPs sampling and analysis in different matrixes</p> <p>Performed Cost-benefit Studies</p> <p>Existing Infrastructure at a national level for control and monitoring of POPs</p> <p>Finished and implemented Support Plan / Progresses according to established terms</p>	<p>Printed and broadcasted endorsed Norms</p> <p>Sampling and analysis Protocols of POPs</p> <p>Talks Information / Training workshops / Participants List / Issued Certificates</p> <p>Printed and broadcasted Cost-Benefit Studies</p> <p>Acquired equipments / reagents</p> <p>Testing and analysis performed</p> <p>Request for accreditation / Accreditation Certification</p> <p>Progress reports of the Support Plan to Laboratories</p>	<p>CNC/ SEAM / INTN / ONA</p>
<p>1.5 Implementation of an Inter-institutional Information System and of public character</p>			
<p>1.5.1 To develop and implement mechanisms of information interchange</p>			
<p>To develop inter-institutional Convention for trespassing information to the Database of POPs implemented in SEAM</p> <p>To develop a legal tool to urge the sources to input pertinent information</p> <p>To design and implement the harmonized input system</p> <p>To train the SEAM personnel to perform the system administration and maintenance</p>	<p>Agreements among Institutions, approved and signed</p> <p>Legal support tool approved and broadcasted</p> <p>Input Forms implemented in the system</p> <p>Talks addressed to the technical and administrative personnel in charge of the system</p> <p>Nr. of data input in the system</p>	<p>Agreements signed among Institutions</p> <p>Reports of the meetings and report of corrections and progress</p> <p>Finished and implemented Forms</p> <p>Reports of data input in the system</p> <p>Reports produced dynamically in the System</p> <p>Reports of performed talks – List of participants and issued Certificates</p>	<p>SEAM / CNC</p>

Proposed Activities	Achievement Indicators	Means of Verification	Responsible Institutions
1.5.2 To develop and to implement a diffusion and publication procedure of the contained information			
To design and implement reports mechanisms of public characteristics To train the SEAM technicians to perform the updating of public reports	Public reports, implemented and updated Talks addressed to the technical and administrative personnel in charge of data collection	Meetings Reports and correction and progress report Mechanisms of public report, printed and disseminated Reports of performed talks – List of participants and issued Certificates Printed Reports and/or available in the Web	SEAM / NGOs

3.3.2 Emission Reduction of Dioxins and Furans

The out-of-control burning of waste in open air, as well as the incineration of obsolete equipments for hospital wastes, constitute two types of activities realized in our country, that not only represent a high emission of COPNI to the environment but also a preoccupation of national interest that affects mainly the people who live in the areas where these activities are performed.

Due to what was expressed above, two action Plans are described below related to solid and hospital wastes management in an appropriate and sustainable way, with the application of clean technologies and the implementation of practices that are likely to reduce the quantity of wastes as well as the contamination associated with a bad management of them.

General Objective	Specific Objectives	Principal products	Responsible Institutions
To reduce the relieves of Dioxins and Furans in the sources of greater influence resulting from the National Inventory, through economically feasible and socially accepted measures	<ul style="list-style-type: none"> - To reduce Dioxins and Furans emissions generated from Urban Solid Wastes burning in the Eastern Region of the country - To reduce Dioxins and Furans emissions generated from the incineration of hospital wastes 	<ul style="list-style-type: none"> - Strengthening of national capacities for management of Solid Wastes - Training of population - Application and diffusion of the BAT/BEP in relation to the Solid Wastes management 	SEAM / MSP y BS / MEC / Government / Municipalities / NGOs

Proposed Activities	Achievement Indicators	Verification Means or ways	Responsible Institutions
2.1 Integral Management of Urban Solid Wastes			
2.1.1 To elaborate and implement sustainable Plans for Urban Solid Wastes			
<p>To elaborate studies of economic sustainability for the implementation of management Plans of Urban solid Wastes, developed for different municipal income levels.</p> <p>To plan the implementation of proposed measures in municipalities with more than 8.000 inhabitants in the Eastern Region of the country¹</p> <p>Implementation and monitoring of proposed measures</p>	<p>Economic sustainability Studies for the implementation of Management Plans for Urban Solid Wastes</p> <p>Progresses, achievements and inconveniences found during the implementation of the proposed measures in municipalities with more than 8.000 inhabitants from the Eastern Region of the country</p>	<p>Progress informs about the studies performed</p> <p>Printed Studies approved and disseminated in municipalities of the Eastern Region of the country</p> <p>Progress Reports of the implementation of proposed measures</p> <p>Monitoring Reports</p>	SEAM / Government Departments/ Municipalities
2.1.2 To elaborate and to implement Training Plans for decision makers and technicians involved in the Integral Management of Urban Solid Wastes			
<p>To elaborate and to print didactic material and guides about the GIRSU for decision makers and technicians</p> <p>To elaborate and to execute a Training Plan and Schedule about the GIRSU to decision makers and technicians involved</p>	<p>Nr of didactic materials and guides about the GIRSU</p> <p>Nr of training activities performed in municipalities of the Eastern Region of the country</p> <p>Nr of trained decision makers and technicians</p> <p>Evaluation of performed training activities</p>	<p>Didactic Materials and Guides about GIRSU, printed and disseminate</p> <p>Training Plan and Schedule of execution, printed and approved by the responsible institutions</p> <p>Participants Lists in the training activities in Execution and evaluation Reports on training activities</p>	SEAM / Government Departments / Municipalities
2.1.3 To elaborate and to implement awareness and educational campaigns to the population about the Integral Management of Urban Solid Wastes			
<p>To elaborate and print materials of awareness about IMUSW</p> <p>To Organize and execute an Awareness and educational campaign about IMUSW to people in coordination with Local, Neighborhood Communities Educational Centers and NGOs</p> <p>Monitoring and evaluation of the Awareness Campaign</p>	<p>Nr. of awareness materials</p> <p>Nr. of awareness activities performed in neighborhood communities and educational centers of municipalities of the Eastern Region of the country</p> <p>Evaluation of awareness activities performed</p>	<p>Awareness Material about IMUSW, printed and disseminated</p> <p>Awareness Campaign and Schedule of execution, printed and approved by the responsible institutions</p> <p>List of participants in the awareness activities</p> <p>Diffusion of different activities by written, radial, television press and Internet</p> <p>Execution and Evaluation Reports about the awareness activities</p>	SEAM / Regional Governments / Municipalities / MEC / NGOs

¹ It has been considered the municipalities with a population greater than 8.000 - 10.000 inhabitants, located in the Eastern Region of Paraguay, for being the most populated area, there municipalities belong to the classification according to levels III and IV, with a urban population above 8.000 inhabitants and an income greater than USD 65.000 US\$/year

Proposed Activities	Achievement Indicators	Verification Means or ways	Responsible Institutions
2.1.4 Selection of activities to be developed and implemented according to the reality of each community			
<p>To elaborate IMUSW Plans at short and long-term</p> <p>To implement short-term systems for collection a segregation of USW</p> <p>To implement medium-term systems for collection and segregation of USW</p> <p>To implement short-term guidelines for an adequate final disposition of USW</p> <p>To implement medium-term guidelines for an adequate final disposition of USW</p> <p>Monitoring and Evaluation</p>	<p>Plans finished for collection, segregation and final disposal of the USW for municipalities with more than 8.000 inhabitants of the Eastern Region of the country²</p> <p>Measures for the collection and segregation of USW implemented in municipalities of more than 8.000 inhabitants³</p> <p>Measures for the collection and segregation of USW implemented in municipalities with more than 30.000 inhabitants⁴</p> <p>Sanitary Landfill – Manuals implemented in municipalities with more than 8.000 inhabitants⁵</p> <p>Sanitary Landfill Level II implemented in municipalities with a population greater 30.000 inhabitants⁶</p> <p>Evaluation of progress and results</p>	<p>Recruitment Documents of selected professionals</p> <p>Reports about the progress of the Plan</p> <p>Delivery Record of final document to SEAM</p> <p>Meetings to be recorded in the Minutes established among the responsible institutions</p> <p>Plans of IMUSW are printed, approved and broadcasted in municipalities of the Eastern Region of the country</p> <p>Dumps and Containers installed in the municipalities framed and considered as part of the Management program</p> <p>Annual Reports about percentage of scope of collection and garbage generated in the municipalities w IMUSW were implemented</p> <p>Monthly Reports about quantity of recycled material collected and segregated in the municipalities</p> <p>Supporting document about the purchase of land for construction of sanitary landfill</p> <p>Three-months reports about progress son the execution of work</p> <p>Reports on the finalization of sanitary landfill in the municipalities</p> <p>Visit Reports for verification of information</p> <p>Progress Report of the implementation of proposed measures</p> <p>Monitoring Reports</p>	<p>SEAM / Municipalities</p>

² It has been taken the municipalities with a population greater than 8.000 - 10.000 inhabitants, located in the Eastern Region of Paraguay, since it is the area with greatest population density, these municipalities correspond to those classified according to levels III and IV, with a urban population of more than 8.000 inhabitant and an income higher than USD65.000 per year

³ In this point the criteria of segregation, recycling, valuation of municipal wastes, selective collection were introduced for municipalities with a urban population between 8.000 and 20.000 inhabitants, a generation rate of 0,85 kg/hab./day

⁴ In this section, the parameters for the activities related to segregation, recycling, valuation, selective collection, appropriate collection, were considered the municipalities with a population between 20.000 and 100.000 inhabitants, the rate of urban waste generation an average of 1,10 kg/inhab./day: at this point, the municipalities of Paraguay that have this characteristic are few

⁵ The final disposition in sanitary landfills in a manual way, is a technical, environmental and economical possible alternative, according to the characteristics of the Paraguayan municipalities, for the elimination of generated wastes, subsequent to the programs of decrease in sources, recovering, re-utilization, recycling and valuation of urban wastes, meanwhile, the compost is not taken into account, since the treatment of wastes from an organic source, are not profitable for the municipalities, even though is true that it is an appropriate environmental technique, economically is not feasible, since a large part of the agricultural soil in the country is fertile

⁶ The sanitary landfill Level II, requires of more complex engineering techniques since it is operated with heavy machines, this point is prepared, for the municipalities with a population larger tan than 30.000 inhabitants, with a superior consumption habit and also with a higher level of income

Proposed Activities	Achievement Indicators	Means of Verification	Responsible Institutions
2.2 Integral Management of Hospital Solid Wastes			
2.2.1 To train the involved personnel			
To elaborate Training Campaigns with the purpose of minimizing the volume of Hospital Waste and the good practice associated to its management	Didactic Materials (CDs, videos, manuals, etc.) to be distributed during the training activities Nr of training activities carried out in support centers for public health care	Didactic Materials, disseminated Training activities Reports / List of participants / issuance of Certificates Diffusion of different activities by means of written press (regional and central) and TV programs of great dissemination and broadcasting, radio programs	SEAM / MSP y BS
2.2.2 To foster an appropriate Management of Hospital solid Wastes/ Application of the BAT/BEP			
To elaborate Manuals on HSW integral management, agreed with the stakeholders To encourage the implementation of internal policies related to the correct management of the HSW To elaborate Management Plans of HSW in coordination with the people in charge of the health support centers To implement measures for the reduction in volume or waste quantity To implement appropriate storage, collection and transport measures to mitigate the impacts associated with HSW To evaluate treatment options with the application of clean technologies for the elimination of HSW To implement alternative treatments than incineration To adapt incineration equipment in use To elaborate sustainable Programs about HSW management to be replicable in other health centers	Manuals for the integral management of HSW Reduction Measures in origin, implemented in the main health centers Storage, collection and transport measures implemented in the main health centers Evaluation of treatment options Alternative Treatments besides the incineration, implemented Appropriate incineration Equipments Sustainable Programs for HSW management	Meetings Minutes performed with the stakeholders, in relation to the HSW Lists of participants in meetings for the discussion on manuals Minutes about the meeting carried out with the different people in charge of the welfare support centers Measures Implementation Reports in institutions in accordance to its progress	SEAM / MSP y BS

3.3.3 Polychlorinated Biphenyl Management

Even though the Inventory does not reflect yet the national reality in respect of the quantity of this POP in our country, due mainly to the limitations found at the moment of its elaboration, like the lack of interest and/or knowledge, the lack of analytical capacity and the absence of a national regulation that rules the management associated to this pollutant, indeed, it reflects the main inconvenient found which is an appropriate management of equipments and/or materials which contain PCB.

Consequently, with the following Action Plan it is tried to establish a sustainable mechanism for a continue updating of the national Inventory, but it is pretended also to strength the national capacities for an integral management of PCBs, and to develop support tools for potential owners to be able to identify the existence stocks and to plan an appropriate management for them.

General Objective	Specific Objectives	Main products	Responsible Institutions
<p>To identify and eliminate the existing stocks of Polychlorinated biphenyls at a national level, through an appropriate environmental management</p>	<ul style="list-style-type: none"> - To strength the National Capacity for an appropriate management of PCBs - To identify and/or update stocks of oil, equipment and materials which contain PCB, as well as the activities which are potential generators of contamination by PCB - To elaborate and implement PCB Management Plans for the different interest sectors identified through the National Inventory, with the objective of an appropriate environmental elimination of oils, equipments and/or materials which contain PCB 	<ul style="list-style-type: none"> - Resolution about PCB Management disseminated and implemented - Training Plan addressed to different sectors, implemented - Sampling Capacity in different matrixes - Updated Inventory - Management Plans applicable in different sectors 	<p>SEAM / ANDE / CPL / UIP / MIC / DNA / Owners / Manufacturers / Repair workshops</p>

Proposed Activities	Achievement Indicators	Means of Verification	Responsible Institutions
3.2 Strengthening of the National Capacity for PCB Management			
3.1.1 Diffusion and implementation of legal tools related to PCB Management			
To disseminate the PCB Management Resolution To include as part of the technical information of the CAB, the identification of equipments and/or materials containing PCB To train public officers of the involved Institutions	Resolution, disseminated Identification Spreadsheet of equipments and/or materials with PCB included in the CAB Training Activities	Resolution, printed and disseminated Identification Spreadsheets, completed by the CABs Reports on talks / List of participants / Certificates issued / Participation Evaluation	SEAM / ANDE / DNA
3.1.2 Elaboration and putting into effect of a continuous training Plan for interested parties			
To elaborate and print a PCB Management Manual which must include Security Norms for the manipulation, storage and transport To elaborate a continuous and sustainable Training Plan to be implemented by the interested parties To implement the Training Plan	PCB Management Manual, finished and approved by the SEAM Training Plan, approved Talks / Training Workshops / Field tasks	Meetings Reports and reports of corrections and progress Manuals, printed Training Plan, printed Reports on Workshops / List of participants / Certificates, issued / Evaluation of participants	SEAM / ANDE / DNA
3.1.3 Development of Sampling Capacities			
To establish sampling protocols (labels design, filling forms security requirements, etc.) To elaborate and print a Procedures Manual of sampling in different matrixes To purchase a sampling equipment (protection equipment, sampling containers, labels, etc.) To train the involved personnel	Sampling Protocols, established and disseminated Sampling Procedures Manual, finished Necessary Equipment for sampling, purchased Training Talks to personnel involved in sampling	Sampling Protocols, printed and disseminated Report on equipment necessities / Approval of budget / Reception of equipment Reports on maintained talks / List of participants / Certificates, issued / Evaluation of participants	SEAM

Proposed Activities	Indicators of accomplishment	Means of verification	Responsible Institutions
3.3 Updating and monitoring of PCB National Inventory			
3.2.1 Updating of the Energy Sector Inventory			
<p>To support with technical criteria and human resources the processes of identification, sampling and analyses and labelling</p> <p>To establish an updating and continuous monitoring mechanism of the Inventory of entities which generate, transmit and distribute energy, through a POPs Database and the inter-institutional feed-back</p>	<p>Working Plan / Schedule of visit and sampling</p> <p>Labelled Equipments according to their classification</p> <p>Updated data in the Databases / Institutional Reports</p>	<p>Working Plan and Schedule, approved</p> <p>Progress Report according to the Working Plan and Schedule</p> <p>Official Forms duly filled and updated, filed in the SEAM</p> <p>Labelled Equipments</p> <p>Sampling Report</p> <p>Analysis Certificates</p> <p>Labelling Report of classification</p> <p>Updated Database</p>	<p>SEAM / ANDE / Hydroelectric Dams / CLYFSA</p>
3.2.2 Identification of sources and updating of data from the interim Inventory in other sectors			
<p>To Plan Sampling/analyses activities in other sectors identified as potential owners or those who are in possession</p> <p>To Identify and/or evaluate activities which generate contamination with PCB in sectors where equipments, oils and contaminated materials are handling</p> <p>To establish a continue updating mechanisms of the Database in the SEAM, based on what identified in CABS</p> <p>To analyze the collected information and generate half-yearly reports</p>	<p>Working Plan / Schedule of visits and samplings</p> <p>Equipments// Materials and sampling containers, labelled</p> <p>Updating Data in the Database</p>	<p>Working Plan and Schedule, approved</p> <p>Progress Report according to the Working Plan and Schedule, approved</p> <p>Official Forms duly filled and updated, filed in the SEAM</p> <p>Equipments, labelled / Sites, visited</p> <p>Sampling Reports</p> <p>Reception of labelled containers in Laboratories</p> <p>Certificates of analysis</p>	<p>SEAM</p>
3.2.3 Elaboration of the Inventory			
<p>To elaborate and update the Inventory according to the progress specifying the existing stock already eliminated and/or reclassified</p> <p>To publish and disseminate the National Inventory I</p>	<p>National Inventory, updated</p>	<p>Documents of Inventory corrections</p> <p>Dynamic Reports generated in the Database System</p> <p>Printed and disseminated specifications for public information</p> <p>National Inventory, printed</p> <p>Publication and dissemination Workshops reports / List of participants</p> <p>Articles of written press</p> <p>Files of radio and television press</p>	<p>SEAM</p>

Proposed Activities	Indicators of accomplishments	Means of Verification	Responsible Institutions
<p>3.4 Elaboration, approval and implementation of PCB Management Plans of the different interested parties</p>			
<p>To Plan and implement support activities to those who possess, manufacturers and repairers for the elaboration of PCB Management Plans</p> <p><u>Owners or Possessors</u></p> <p>To elaborate Management Plans of contaminated equipment and/ materials which might include: Maintenance Plan for equipments in use; Disposal Plan of equipments in use; of maintenance of equipments in use; Plan of re-classification of contaminated equipments; Plan of elimination of equipments that cannot be classified and/ or contaminated materials; Evaluation of risk/ Prevention and Correction Measures; Training Plan for workers and Accomplishment Schedule</p> <p><u>Manufactures / Repairers</u></p> <p>To elaborate Management Plans which might include: Strengthening and/or adaptation or adjustment of maintenance and repairing infrastructures that guaranty no contamination of equipments; Implementation of measures for the control and monitoring of equipments and oils; Evaluation of risks/ Measures of Prevention and correction; Training Plan for workers and Accomplishment Schedule</p> <p>To present Management Plans to SEAM for its evaluation and approval</p> <p>To implement Management Plans, approved according to established terms</p>	<p>Support Programs for advising or consultancy/ Workshops / Technical Visits</p> <p>Management Plans-presented, evaluated and approved</p> <p>Activities implemented according approved terms</p>	<p>Reports of performed activities Approved Management Plans, printed Verification and evaluation Reports of implemented measures Forms and Database, updated Monitoring Reports Approved Management Plans, printed Verification and evaluation Reports of implemented measures Forms and Database, updated Monitoring Reports</p>	<p>SEAM / ANDE / CPL / UIP / MIC / Owners/ Manufactures / Repairers</p>

Proposed Activities	Indicators of accomplishment	Means of verification	Responsible Institutions
<p>3.5 Selection and implementation of technologies for the Reclassification and/or Elimination of found existing stocks</p>			
<p>To Plan and implement support activities to possessors, manufacturers and repairers for the selection of technologies cost-effective and environmentally appropriate for the re-classification and/or elimination of found existing stocks</p> <p>To support initiatives of national capacities development for interim storage and treatment of oils and other materials contaminated with PCB through the performance of studies of cost-benefit evaluation for the development of storage and treatment Infrastructures</p> <p>To provide with the necessary technical criteria to the possessors of existing stocks identified through the interim Inventory for treatment and/or elimination of contaminated oils, equipment and/or materials</p> <p>To plan, in coordination with the possessors and/or Owners, the monitoring of the selected treatment and/or elimination</p>	<p>Support Programs for advising and/or counselling / Workshops</p> <p>Studies, performed / Options, identified</p> <p>Monitoring Plan of treatment and/or elimination activities / Progress in accordance with the established terms</p>	<p>Reports of activities, performed Studies, printed Treatment and/or elimination Plans, approved and printed Verification and evaluation Reports of measures, implemented Monitoring Reports in accordance with the progress Forms and Database, updated</p>	<p>SEAM / ANDE / Possessor/owners</p>

3.3.4 POP Pesticides Management

Even the POP Pesticides registered in the Inventory through the SENAVE – FAO Project do not represent an important amount compared with the obsolete stocks of other types of Pesticides, through this Action Plan is pretended to accompany the foresighted activities in the mentioned Project, through the development and implementation of sound and reliable measures.

It is also pursuit the creation of an inter-institutional link among the SEAM, SENAVE and the Ministry of Public Health and Social Welfare (MSP and BS) to carry out the interim storage and later elimination of these components in a sound way, establishing roles and specific and clear responsibilities between both institutions.

Since it is a topic of great national interest, it is also pursuit the public participation through the creation of a consultancy and/or information space which has relation with the POP Pesticides which exist today in the country.

General Objective	Specific Objectives	Principal products	Responsible Institutions
<p>To generate the appropriate sanitary and environmental conditions for the disposition and elimination of Obsolete POP Pesticides</p>	<ul style="list-style-type: none"> - To strength and support the measures proposed in the framework of the SENAVE – FAO Project for the Management of Identified POP Pesticides - To develop and implement tools for updating of the National Inventory of POP Pesticides - To train the population about the management related to POP Pesticides in order to avoid their use and accumulation of new existing stocks already expired 	<ul style="list-style-type: none"> - Accompany Plan and strengthening for the Management of identified POP Patricides - Communication Mechanism open to the public for updating the National Inventory of POP Pesticides - Training and Monitoring Plan in coordination with other existing programs at a national level 	<p>SEAM / SENAVE / MSP y BS / NGOs</p>

Proposed Activities	Indicators of accomplishment	Means of verification	Responsible Institutions
<p>4.1 Support and Monitoring of local disposition and elimination activities of POP Obsolete Pesticides under the SENAVE-FAO Project framework</p>			
<p>To elaborate a Monitoring Plan of the actions for the interim disposal and later elimination of identified Obsolete POP Pesticides, under the SENAVE – FAO Project framework</p> <p>To establish protocols and procedures, identifying clear institutional roles and responsibilities for a correct management if the expired stocks</p> <p>To carry out training activities for the involved personnel in the management of found stocks s</p> <p>To perform cost-benefit studies for the selection of interim storage sites and elimination technologies for the found stocks</p> <p>To performed monitoring activities in accordance with progresses of the SENAVE – FAO Project.</p>	<p>Plan, approved</p> <p>Procedures and Management Manual for management of Obsolete Pesticides</p> <p>Training Activities for existing obsolete stocks</p> <p>Cost-benefit Studies of possible contaminated sites and available technologies</p> <p>Progress in accordance with the SENAVE – FAO Project</p>	<p>Plan, printed and disseminated</p> <p>Manual, printed and disseminated</p> <p>Training activities Reports /List of participants / Certificates, issued</p> <p>Cost-benefit studies, printed and disseminated</p> <p>Monitoring Reports according to progress / Photographic Documentation</p> <p>Final Report about elimination procedures</p>	<p>SEAM / SENAVE / MSP y BS / NGOs</p>
<p>4.2 Updating and Monitoring of the POP Pesticides National Inventory</p>			
<p>To establish a communication mechanism open to the public, in the related Institutions, in order to inform about the potential existence of POP Pesticides in companies or places not covered by the National Inventory</p>	<p>Available Mechanisms for advising and pertinent information (Space in the Web, telephone lines, filling forms, etc.)</p>	<p>Reports on obtained data and questions received and answered</p> <p>Database on POP Pesticides, updated</p>	
<p>4.3 Training to the population about the POP Pesticides Management</p>			
<p>To elaborate and implement a Training and Monitoring Plan to avoid using an new accumulation of PP pesticides stocks, in a coordinated way with other projects and/or existing training programs</p>	<p>Training and Monitoring Plan (including didactic materials) approved and implemented</p>	<p>Didactic Materials, printed and disseminated</p> <p>Workshops Report, talks, training programs, started</p>	<p>SEAM / SENAVE / MSP y BS / NGOs</p>

3.3.5 Management of Sites Contaminated by POPs

During the evaluation of the sites where there might be found some kind of contamination by some of the POPs established in the Convention, once more the analytical factor constituted a constraint. The performed evaluation achieved the identification of such sites which are considered potentially contaminated, but whose analyses to determine the grade of contamination is still necessary.

In the following Plan of action, it is proposed to identify the contamination sources and the level reached in the SPC, as well as to develop strategies and plans for their remediation. The training factor is also an important point for achieving the activities.

General Objective	Specific Objectives	Principal products	Responsible Institutions
To identify, prioritize and remedy the POP contaminated sites	<ul style="list-style-type: none"> - To develop procedures for identification and Sites identified as contaminated - To evaluate existing remediation alternatives for the sites identified and prioritized 	<ul style="list-style-type: none"> - Procedures for identification and prioritization of Contaminated Sites - Evaluation of remediation technologies of the contaminated sites with POP san implementations of them. 	SEAM / MSP y BS / owners

Proposed Activities	Indicators of Accomplishment	Means of verification	Responsible Institutions
<p>5.1 Procedures for identification and prioritization of Contaminated Sites based on the SPC inventory</p>			
<p>To develop a Guide for the identification, characterization and prioritization of contaminated sites. Characterize the contamination sources</p> <p>Prioritize the identified Sites</p>	<p>Guide for identification, characterization and prioritization of Contaminated Sites</p> <p>Evaluation of Potentially Contaminated Sites / Analyses performed / Prioritization</p>	<p>Printed Guide Evaluation Reports Sampling Report / Photographic Documentation Reception of labeled containers in laboratories Certificate of analyses Evaluation and prioritization of contaminated sites</p>	<p>SEAM / Possessors</p>
<p>5.2 Analysis of existing technologies for remediation of the POPs Contaminated Sites</p>			
<p>To analyze remediation technologies applied to a regional and international level / To perform studies of Cost-benefit</p> <p>To elaborate Remediation Plans of POP Contaminated Sites identified and prioritized</p> <p>To perform Training activities about Contaminated Sites with POP</p> <p>To implement approved measures</p>	<p>Analyses and studies performed / Identified Options</p> <p>Remediation Plans approved by institutions in charge</p> <p>Workshops /Talks / Training Events about Contaminated Sites Management and their remediation and/or treatment</p> <p>Decontaminated Sites</p>	<p>Studies, approved and disseminated to interested people Plans of Remediation, approved Workshops Reports / Talks / Events / List of participants / Certificates, issued Reports on progresses Final Report of Remediation / Photographic Documentation / Analyses, performed</p>	<p>SEAM / MSP y BS / Possessors</p>

3.3.6 Awareness, information and education of public

The knowledge level of the population about POPs and the prevention and remediation actions against contamination and exposition to them is still low, since the topic is not considered of great interest by the means of communication and educational centers because it is considered too technical and even more, abstract. Even though in the last months of elaboration of the NIP, a greater participation of the press and educators was obtained, it is considered of great importance the performance of this Action Plan in order to promote to these sectors a greater dissemination through programs and synergies which involved the NGOs also.

On the other hand, the implementation of communication spaces in order to reach all levels of population, it is indispensable to continue with the processes already started.

It is also considered of importance that the municipalities far away from the metropolitan areas have the necessary to inform and to educate their people. Therefore, the creation and implementation of a replicators' network that cover all the national territory was proposed.

General Objective	Specific Objectives	Principal products	Responsible Institutions
To develop an effective and continuous strategy of information, awareness and formation of the citizenship about POPs and the Stockholm Convention	<ul style="list-style-type: none"> - To establish a continuous awareness and diffusion mechanism about POPs and the NIP - To develop and to insert in all educational programs aspects related to POPs Management - To develop communication spaces, open to the public 	<ul style="list-style-type: none"> - Replicators Network about POPs with a national coverage - Educational Programs about POPs inserted in the curriculum of Educational Centers programs - Interactive Spaces of public communication 	SEAM / MEC / CNC / NGOs

Proposed Activities	Indicators of Accomplishment	Means of verification	Responsible Institutions
<p>6.1 Development and implementation of a Replicators Network with a national coverage</p>			
<p>To train replicators teams integrated by different public Institutions and NGOs</p> <p>To train the representatives of the communities of different municipalities of the country about the POPs management, NIP and the Stockholm Convention</p> <p>To implement a continuous intercommunication system among municipalities and the SEAM for evaluation and monitoring of the started activities</p> <p>To build synergies and to generate interchange with other related initiatives, projects, programs and/or campaigns carried out at a national level</p> <p>To identify started activities with positive results and the participation of the community in order to promote the replication of them in other communities</p>	<p>Nr of trained replicators</p> <p>Communities aware and active before the POPs management in their places</p> <p>Intercommunication System in force</p> <p>Synergies with existing programs in the communities</p> <p>Positive Activities, selected and disseminated for their replication in other communities</p>	<p>Reports of workshops performed in Asunción and the countryside of the country / List of participants / Certificates issued</p> <p>Synergies Document with existing programs</p> <p>Reports of inter-communication system</p> <p>Reports of monitoring and evaluation of started activities</p> <p>Diffusion of positive activities with national coverage</p>	<p>SEAM / CNC / NGOs</p>
<p>6.2 Implementation, monitoring, and evaluation of the insertion of educational programs at primary and secondary level</p>			
<p>To develop and implement a Monitoring and evaluation Plan through a Fostering Group, the starting up of an educational Program on Solid Wastes and Chemical Substances Management</p> <p>To enlarge and implement the educational Program at all levels of the primary and secondary education</p> <p>To elaborate and print a Manual for teachers and educators in accordance to the approved Program /To socialize the Manual</p> <p>To elaborate and print educational materials in accordance to the progress</p>	<p>Development, finishing, approval and implementation of the Monitoring and evaluation Plan (includes human and financial resources)</p> <p>Proposal and execution of the Meetings Schedule / Workshop in charge of the Fostering Group for the enlargement of the Educational Program</p> <p>Proposal of enlargement of the educational program approved by MEC and SEAM</p> <p>Workshops of presentation/training about enlargement of the program/ Diffusion of the Manual for the teachers</p> <p>Educational Materials elaborated and approved by MEC and SEAM</p>	<p>Monitoring and evaluation Plan, approved</p> <p>Activities Schedule, approved</p> <p>Report on the progress activities according to the Schedule and Plan, approved</p> <p>Enlargement Proposal, printed and disseminated</p> <p>Manual for teachers, printed and disseminated</p> <p>Presentation Workshops reports/Training / List of participants / Certificates, issued</p> <p>Educational Materials, printed and disseminated in educational centers</p>	<p>SEAM / MEC / CNC / NGOs</p>

Proposed Activities	Indicators of accomplishment	Means of verification	Responsible Institutions
6.3 Implementation, monitoring and evaluation of the insertion into the educational programs at the university level			
<p>To develop and implement agreements with the Universities in order to insert the topic of POPs into the related careers</p> <p>To elaborate Studies Plans, through multi-disciplines teams for the insertion of the POPs topic in the curriculum / Training for instructors</p> <p>To elaborate and implement a monitoring Plan to the started activities, that might include people in charge, Schedule and necessary resources</p> <p>To design and implement internships training programs about POPs and support to the most vulnerable communities</p>	<p>Agreement, signed and implemented</p> <p>Studies Plans which should include the topic of POPs</p> <p>Training Workshops to instructors in the topic of POPs</p> <p>Monitoring Plan, approved and implemented</p> <p>Internship Programs disseminated in Universities</p> <p>Started Internships</p>	<p>Agreements, signed, printed and disseminated</p> <p>Meetings Reports performed for the elaboration of the Studies Plans</p> <p>Study Plan , printed and disseminated</p> <p>Training Workshops reports / List of participants / Certificates, issued</p> <p>Reports of meeting carried out for the elaboration of Internships Programs</p> <p>Reports on estarte intenrships</p>	<p>SEAM / CNC / MEC / NGOs</p>
6.4 Development and implementation of Educational and Informative Campaigns addressed to different sectors of interest and by different means of communication			
<p>To elaborate and disseminate about POPs and activities related through the written press in Spanish and Guarani</p> <p>To create and implement communication spaces by radio to be broadcasted by communities' radio stations, university stations, etc.</p> <p>To create an interactive space for the people in the Web site of the NIP which should contain the progress, results and proposals, and link them to other related spaces</p>	<p>Educational collectable Materials through written press</p> <p>Radio spaces , implemented</p> <p>Public opinion Space in the Web of the NIP</p>	<p>Educational collectable Material, printed and disseminated</p> <p>Radio programs recorded</p> <p>Public opinion space, in force</p> <p>Updated information</p> <p>Monitoring and evaluation Reports</p>	<p>SEAM / NGOs</p>

3.4 Schedule for the execution of the National Plan

Activities proposed	Year 1				Year 2				Year 3			
1.1 Elaboration, diffusion and application of agreed reforms to the environmental legal framework related to the POPs Management												
Proposal of Reforms finished by a multi-discipline team												
Meetings with the CNC for the evaluation of reforms		x		x		x		x				
Proposal of Law reforms submitted to the National Congress								x				
Debate and later approval of the proposal												
Proposal of Resolutions presented to related Ministries												
Debate and later approval of the proposal												
Diffusion of approved reforms in related Ministries												
Training to public officers based on the approved reforms												
Diffusion of approved reforms at a public level												
1.2 Elaboration and diffusion of sustainable National Policies related to the POPs Management												
National Policy of Solid Wastes (1st and 2nd drafts)		x		x								
National Policy of Chemical Substances (1st and 2nd drafts)		x		x								
Meetings with the CNC for evaluation of Policies		x		x								
Policies presented before the CONAM												
Discussion and later endorsement of Policies												
Policies submitted to the National Congress												
Discussion and later endorsement of Policies												
Diffusion of Policies at institutional and public level												
1.3 Creation and/or Strengthening of POPs Management Units												
Management Units carrying out in related Institutions												
Trained Human resources in implemented Management Units												
Cadastral Systems of established data												
Finished Sustainability Plans for Management Units												
1.4 Creation and/or Strengthening of Analytical Capacities of POPs												
Approved Norms												
POPs sampling and analysis Protocols												
Human Resources trained in Laboratories												
Performing of cost-benefit studies												
Laboratories with necessary infrastructure for POPs analyses												
Support Plan to Laboratories finished and implemented												
1.5 Implementation of an Information System- inter-institutional and of public nature												
Inter-institutional Agreements for transferring of information, signed												
Legal Tool, approved and disseminated												

Proposed Activasteis	Year 1												Year 2												Year 3											
3.1 Strengthening of National Capacity for the PCB management																																				
Broadcasted Resolution of PCB Management	██████████																																			
Inclusion in the CAB of equipment and/or materials identification with PCB	██████████																																			
Training Activities to officers from SEAM and consultants	██████████																																			
PCB Management Manual finished and approved by the SEAM	██████████																																			
Training Plan approved and implemented	██████████																																			
Samples Protocols established and defined	██████████																																			
Sampling Procedures Manual finished	██████████																																			
Necessary Equipment for sampling acquired	██████████																																			
Training to personnel involved in sampling	██████████																																			
3.2 Up-dating and monitoring of the PCB National Inventory																																				
Work Planning / visits and Sampling schedule	██████████												██████████																							
Sampling, analysis and labeled equipment according their classification	██████████												██████████																							
Elaboration of an up-dated National Inventory	██████████												██████████																							
3.3 Elaboration, approval and implementation of PCB Management Plans of the different interested parties																																				
Support Programs for counseling / Workshops / Technical field Trips	██████████												██████████																							
Management Plans presented, evaluated and approved	██████████												██████████																							
Monitoring of implemented measures according to approved terms	██████████												██████████																							
3.4 Selection and implementation of technologies for the Reclassification and/or Elimination of found existences																																				
Support Programs for advising about existing technologies	██████████												██████████																							
Elaboration of a Cost-benefit study about identified options	██████████												██████████																							
Monitoring of treatment and/or elimination activities	██████████												██████████																							
4.1 Support and Monitoring of temporary confinement or disposal and elimination activities of POP Obsolete pesticides under the framework of the SENAVE – FAO Project																																				
Accompany Plan, elaborated and approved	██████████												██████████																							
Procedures and Management Manual for CO management	██████████												██████████																							
Training Activities	██████████												██████████																							
Cost-Benefit Studies of places with probabilities and available technologies	██████████												██████████																							
Progress according to the SENAVE - FAO ⁷ Project	██████████												██████████																							
4.2 Up-dating and monitoring of the POP Pesticides National Inventory																																				
Available Mechanisms for consulting and pertinent information	██████████												██████████																							
4.3 Training for the population about POP Pesticides Management																																				
Training Plan and approved and implemented monitoring	██████████												██████████																							

⁷ Progress will depend on the implementation of the SENAVE – FAO Project

3.5 Resources needed

Proposed Activities	Estimated Costs (USD)
1.1 Elaboration, broadcasting and application in a consensus by agreement of reforms to the environmental legal framework related to the POPs management	72.000
Reform Proposal finished by a multidisciplinary equipment	36.000
Meetings with CNC for the evaluation of reforms	4.000
Reforms proposal of Laws presented to the National Congress	-
Discussion and later approval of the proposal	-
Resolutions Proposal presented to related Ministries	-
Discussion and later approval of proposal	-
Broadcasting of approved reforms in related Ministries	12.000
Training of public officers based on approved reforms	12.000
Broadcasting of approved reforms at a public level	8.000
1.2 Elaboration and broadcasting of sustainable National Policy related to POPs Management	44.000
National Policy of solid Wastes (1st. And 2nd. Drafts)	15.000
National Policy of Chemical Substances (1st. and 2 nd . Drafts)	15.000
Meetings with the CNC to evaluate the Policies	4.000
Policies presented before the CONAM	-
Discussion and later approval of Policies	-
Policies presented against the National Congress	-
Discussion and later approval of Policies	-
Broadcasting of Policies at a institutional and public level	10.000
1.3 Creation and/or Strengthening of Management units of POPs inside the related institutions	55.000
Management Units functioning in related Institutions	10.000
Human Resources trained in implemented Management Units	12.000
Census Registration Systems of established cadastre data	18.000
Sustainability Plans finished for Management Units	15.000
1.4 Creation and/or Strengthening of POPs analytical capacities	37.000
Approved Norms	10.000
Protocols of POPs samplings and analysis	5.000
Human resources trained in Laboratories	12.000
Cost- benefit studies performance	2.000
Laboratories with the necessary infrastructure e for POPs analysis	-
Support Plan for Laboratories, finished and implemented	8.000
1.5 Implementation of an intra-institutional information System and of public characteristic	17.000
Intra-institutional Conventions for transferring of signed information	2.000
Approved and implemented Legal tool	4.000
Data input System finished and implemented	5.000
Training to responsible staff	2.000
Design and implemented Public reports Mechanisms	2.000
Training for responsible personnel	2.000
2.1 Integral Management of Urban solid Wastes	2.537.000
Economic Sustainability Studies for the implementation of Urban Solid Wastes Plans Management	12.000
Implementation of measures proposed in municipalities with more than 8.000 inhabitants of the Eastern Region of the country	36.000
Elaboration of training and awareness materials to responsible decision makers and technicians	18.000
Training Activities performed in municipalities of the Eastern Region of the country	36.000
Elaboration of Awareness and educational Material for the population	15.000
Awareness activities performed in neighbor communities and educational centers of municipalities in the Eastern region of the country	45.000
Finished Plans for collection, segregation and final disposition of RSU for municipalities with a greater population of 8.000 inhabitants of the Eastern region of the country	25.000
Measures for the collection and segregation of RSU implemented in municipalities of more inhabitants than 8.000.	350.000
Measures for the collection and segregation of RSU implemented in municipalities with more than 30.000 inhabitants	500.000
Sanitary landfill manuals implemented in municipalities with a population greater than 8.000 habitants	600.000
Sanitary Landfill Level II implemented in municipalities with a population greater than 30.000 inhabitants	900.000

Proposed Activities	Estimated Costs (USD)
2.2 Integral Management of Hospital Solid Wastes	1.935.000
Awareness Activities performed in sanitary centers of public health attention	60.000
Manuals for the Integral Management of HSW (Hospital Solid Wastes), agreed among all the stakeholders	45.000
Implementation of reduction measures in origin in the main health centers	100.000
Implementation of storage, collection and transport measures in the main health centers	125.000
Evaluation of treatment options of the HSW	15.000
Application and implementation in hospitals and Welfare Centers of alternative treatment systems beside incineration	1.000.000
Adaptation of existing incineration equipments	500.000
Elaboration of sustainable Management Programs of the HSW	90.000
3.1 Strengthening of the National Capacity for PCB Management	75.000
Disseminated Resolution of PCB Management	7.000
Inclusion in the CAB of identification of equipments and/or materials containing PCB	-
Training Activities to SEAM public officers and consultants	6.000
Manual about PCB Management, completed and approved by SEAM	12.000
Training Plan approved and implemented	6.000
Sampling Protocols established and disseminated	3.000
Procedures Manual about sampling, finished	10.000
Necessary Equipment for sampling, acquired	25.000
Training of involved Personnel in sampling	6.000
3.2 Updating and monitoring of the PCB National Inventory	136.000
Work Plan / Schedule of visits and sampling	4.000
Sampling, analysis and labeled equipment according to their classification	125.000
Elaboration of updating National Inventory	5.000
3.3 Elaboration, approval and implementation of PCB Management Plans of the different interested parties	60.000
Support Programs for advice / Workshops /Technical Visits	15.000
Management Plans, presented, evaluated and approved	20.000
Monitoring of measures implemented according to approved periods	25.000
3.4 Selection and implementation of technologies for the reclassification and/or Elimination of found existences	92.000
Support Programs for advising in existing technologies	12.000
Elaboration of Cost-Benefit Studies of identified options	40.000
Monitoring of treatment and disposal activities	40.000
4.1 Support and Monitoring of temporary confinement or disposal and elimination of Obsolete POP Pesticides under the framework of SENAVE – FAO Project	64.000
Accompanying Plan, elaborated and approved	7.500
Manual of Procedures and Management of PO handling	7.500
Training Activities	9.000
Cost-Benefit Studies of places with possible contamination and available technologies	10.000
Progresses according to the SENAVE – FAO Project	30.000
4.2 Updating and Monitoring of the POP Pesticides National Inventory	6.000
Available Mechanisms for advising and pertinent information	6.000
4.3 Training for population about the POP Pesticides Management	10.000
Training Plan and approved and implemented monitoring	10.000
5.1 Procedures for identify and prioritize of Contaminated places based on the SPC Inventory	160.000
Elaboration of a Guide to identify and prioritize SC	15.000
Evaluation of SPC / performed Analyses / Prioritization	145.000
5.2 Analyses of existing technologies for the remediation of Sites contaminated with POPs	93.000
Performed Analyses and studies / Identified Options	18.000
Remediation Plans approved by the responsible institutions	30.000
Training Activities about SC Management and its remediation	20.000
Monitoring of Remediation activities for prioritized sites	25.000
6.1 Development and implementation of a Replicators Network at a national level	115.000
Professional training of Replicators teams	5.000
Training Activities in Communities	45.000
Planning and Implementation of an inter-communication System	30.000
Development of Synergies with existing programs in the communities	20.000
Identification of positive Activities and their dissemination to be replicated in other locations	15.000

Proposed Activities	Estimated Costs (USD)
6.2 Implementation, monitoring and evaluation of the insertion of educational programs at primary and secondary level	70.000
Monitoring and evaluation Plan of the Educational Program about POPs	5.000
Expansion of the educational Program to all levels of the primary and secondary education	45.000
Elaboration and dissemination of educational materials for primary and secondary education	20.000
6.3 Implementation, monitoring and evaluation of the educational programs at the university level	35.000
Insertion of the topic of POPs in the related careers at the universities	15.000
Monitoring and evaluation Plan approved and implemented	15.000
Internships Programs of university students, disseminated and initiated	5.000
6.4 Development and implementation of Educational and Information Campaigns addressed to different sectors of interest and by different means of communication	37.000
Design and printing of educational Materials, collectable through the written press	20.000
Creation and implementation of radio spaces	5.000
Creation and implementation of a public opinion space in the Web site of the PNI	12.000
TOTAL	5.650.000

For the accomplishment of the Action Plans, respecting the economic and financial aspects, the national government will contribute offering the building infrastructure necessary for the cabinet work, as well as the transportation means to be used in the accomplishment tasks of seemed activities in each plan; besides, each responsible or involved institution in the monitoring, evaluation of foresight and analysis activities will designate two technical representatives as permanent and alternative before the CNC, the CNC, which will have periodical meetings which will have periodical meetings of a deliberative character and the technical sub-committees quarterly meetings, to evaluate the plan progresses.

On the other hand, strategic alliances will be looked for with national and multinational companies in order that they, as part of their own commitments and social responsibilities, would provide an economic support to certain topics and/or activities related to the plan.

Besides, it is necessary to emphasize the existence of POPs in form of wastes, considered as dangerous wastes, the institutions or people responsible for management, treatment and/or environmentally suitable final disposal are the owners of these wastes, in such context they must foreseen expenses and costs related to its elimination and management.

The estimated costs for the PNI execution and evaluation, established inside the actions plans of each of the components identified as priority will be manage by Paraguay, in order they will get an International Cooperation through different agencies, stipulating an average of 80% of the total cost of the Plan.