



# Kyrgyz Republic

## **NATIONAL IMPLEMENTATION PLAN FOR THE STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS**

BISHKEK 2006

Approved  
Government Resolution № 371  
of the Kyrgyz Republic  
dated 3rd July 2006

NATIONAL IMPLEMENTATION PLAN  
FOR THE STOCKHOLM CONVENTION  
ON PERSISTENT ORGANIC POLLUTANTS

Bishkek 2006

*National implementation plan for the Stockholm Convention on persistent organic pollutants*©

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The National Implementation Plan prepared in accordance with Article 7 of the Stockholm Convention signed on *16th May 2002* and ratified on *19th July 2006*. According to the requirements of the Convention every country shall develop and attempt to implement a plan for the implementation of its obligations under this Convention.

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**КЫРГЫЗ  
РЕСПУБЛИКАСЫНЫН  
ӨКМӨТҮ**



**GOVERNMENT  
OF THE KYRGYZ  
REPUBLIC**

**DECREE**

With the aim of implementing the Stockholm Convention on Persistent Organic Pollutants:

1. Approve the enclosed National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants.
2. Ministries, State Committees, Administrative Departments, Local State Governance Administrations, City Administrations of Bishkek and Osh should adopt all measures for implementing the Stockholm Convention on Persistent Organic Pollutants.
3. The State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic coordinates the implementation of the obligations of the Government of the Kyrgyz Republic under the Stockholm Convention on Persistent Organic Pollutants.
4. Control of the implementation of this Decree rests with the State Fuel- Energy Complex, Mining and Extraction and Natural Resources Branch of the Prime Minister of the Kyrgyz Republic's Administration.

Prime Minister

F. Kulov

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- Ministry of Healthcare of the Kyrgyz Republic;
- Ministry for Industry, Trade and Tourism of the Kyrgyz Republic;
- Ministry of the Economy and Finance of the Kyrgyz Republic;
- Ministry of Foreign Affairs of the Kyrgyz Republic;
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  - Independent Ecological Expertise Public Association;
  - GREEN WOMEN Informational-educational Centre;
  - Democracy and the Environment Public Association;
  - Tabiyat Ecological Movement of Kyrgyzstan;
  - Sustainable Nature Use Non-governmental Association;
  - Biom Youth Ecological Movement;
  - Ecological Safety NGO.

*The National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants* was developed under the supervision of the National Coordination Committee for the Stockholm Convention on POPs formed in accordance with Government of the Kyrgyz Republic Order № 688-p dated 14th November 2003.

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## Abbreviations used in the text

<b>BAT</b>	Best available techniques
<b>BEP</b>	Best environmental practices
<b>CA</b>	Central Asia
<b>CDF</b>	Complex Development Framework of the Kyrgyz Republic till 2010
<b>CTL</b>	Control toxicological laboratory
<b>CPPQD</b>	Chemical Protection and Plant Quarantine Department
<b>DDD</b>	1,1 -dichloro-2,2-bis(4-chlorophenyl)ethane
<b>DDE</b>	1,1 -dichloro-2,2-bis(4-chlorophenyl)ethylene
<b>DDT</b>	1,1,1 -trichloro-2,2-bis(4-chlorophenyl)ethane
<b>DN</b>	Drainage networks
<b>gTEQ</b>	Gram of toxic equivalent
<b>GDP</b>	Gross Domestic Product
<b>GEF</b>	Global Environment Facility
<b>GKR</b>	Government of the Kyrgyz Republic
<b>HCB</b>	Hexachlorobenzene
<b>HCCH</b>	Hexachlorocyclohexane (Lindane)
<b>HTS</b>	Highly Toxic Substances
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources
<b>KR</b>	Kyrgyz Republic
<b>LGA</b>	Local government administrations
<b>LSG</b>	Local self-governance
<b>MAC</b>	Maximum Allowable Concentration
<b>MAWRPI</b>	Ministry of Agriculture, Water Resources and Processing Industry
<b>MES</b>	Ministry of Emergency Situations
<b>MESD</b>	Medical Epidemiological Supervision Department
<b>MESYP</b>	Ministry of Education, Science, and Youth Policy
<b>MH</b>	Ministry of Health
<b>MITT</b>	Ministry of Industry, Trade, and Tourism
<b>MLSP</b>	Ministry of Labour and Social Protection
<b>MRN</b>	Medical Regulations and Norms
<b>MTC</b>	Ministry of Transport and Communications
<b>NAPEP</b>	National Action Plan for Environmental Protection
<b>NAS</b>	National Academy of Science
<b>NEN</b>	National Electricity Networks
<b>NGOs</b>	Non-governmental organizations
<b>NIP</b>	National Implementation Plan
<b>NSC</b>	National Statistics Committee
<b>NSPA</b>	National Strategy for Poverty Alleviation
<b>PCB</b>	Polychlorinated biphenyls
<b>PCDD/PCDF</b>	Polychlorinated dibenzo-p-dioxins/ dibenzofurans
<b>POP</b>	Persistent Organic Pollutants
<b>PRTR</b>	Pollutant Release and Transfer Register
<b>PTCS</b>	Potentially toxic chemical substances
<b>SAPEF</b>	State Agency for Protecting the Environment and Forestry under the Government of the Kyrgyz Republic
<b>SEE</b>	State Environmental Expertise

**SPNA**  
**SSECD**  
**UNEP**  
**WHO**

Specially Protected Natural Areas  
State Sanitary Epidemiological Control Department  
UN Environment Programme  
World Health Organization

## Introduction

Since gaining independence the Kyrgyz Republic has actively participated in the efforts of the international community to resolve environmental problems, both globally and locally. This is supported by the fact that the Kyrgyz Republic joined the *Stockholm Convention on Persistent Organic Pollutants* (hereinafter - POPs) that has the main aim of preserving human health and protecting the environment from the adverse effects of producing and using POPs.

Neither single developed country, no bilateral or regional agreements can successfully resolve the problem of limiting and eliminating POPs. The need to consolidate the efforts of all countries in solving the POPs problem is not only because of their toxic influence on the human and animal world, large scale application and huge stockpiles, but also the very nature of POPs that have unique combinations of physical and chemical properties.

A "dirty dozen" POPs that includes dioxins, furans, polychlorinated biphenyls (PCBs), mixtures of DDT isomers and a number of other chlorine-organic pesticides, creates adverse effects, is able to accumulate in the environment, in clearly defined accumulations in biota and food chains, has long half lives and the potential to be carried long distances and as such has been recognized as a global danger to people's health and the state of the natural environment.

Considering the principles for undertaking precautionary measures as an important element, the Stockholm Convention contains basic principles and objectives that the Parties should follow when carrying out measures aimed at limiting the use and then completely stopping production and eliminating sources of POPs releases.

Annex A to the Stockholm Convention lists chemicals that should be eliminated:

- Aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene (HCB), mirex, polychlorinated biphenyls (PCB), toxaphen.
- As regards PCBs, the following objectives and obligations have been established:
- Immediate cessation of production of new PCBs;
- Stop using equipment containing PCBs by 2025;
- Provide environmentally sound elimination of PCBs not later than 2028;
- Every five years submit a report on measures for stopping production and using PCBs to the Conference of the Parties.

Annex B to the Stockholm Convention lists obligations in relation to DDT:

- Stop its production and application with the exception of cases when it is used for disease vector control;
- Create a publicly available DDT register;
- Help as far as possible in scientific research and working out safe alternatives to DDT.

Another important task is reducing the releases listed in Annex C including those of dioxins/furans, HCB, PCB and, where it can be carried out, final elimination of all sources of releases. The Convention lists 20 types of sources that can cause unintentional releases of POPs into the environment.

One of the measures for reducing or eliminating existing and new sources of releases as the result of unintentional production of POPs is through developing an action plan for applying BAT and BEP.

The Convention lays down measures about the management of stockpiles and wastes, as they contain POPs, including products and items that have been transformed into wastes.

In this connection, the following obligations should be met:

- Develop and implement a strategy for identifying POPs stockpiles and wastes;
- Provide safe, effective, and environmentally rational control of stockpiles;
- Use environmentally sound measures when collecting, processing, transporting, and storing wastes;
- Remove wastes by means of destroying the POPs they contain or by another environmentally sound method taking into consideration international rules;
- Prohibit the disposal of wastes, as this can result in the recovery, recycling, reclamation, direct reuse or alternative uses of persistent organic pollutants and their transportation across

- the boundaries of neighboring states without considering international rules;
- Develop appropriate strategies on identifying areas polluted with the chemicals listed in Annexes A, B, and C.

The Convention does not demand remedial work. However, if such work is carried out it should be done in an environmentally sound way. The Stockholm Convention's general obligations include:

- Establishing a national coordination centre;
- Working out and implementing a national implementation plan (NIP) on the obligations laid down in the Convention during the two years after it comes into force in a country;
- Providing communities with full information about POPs, undertaking measures to raise awareness and training managers of enterprises and organizations;
- Within the available resources, stimulate scientific research, monitoring, development and cooperation on all aspects of POPs and their alternatives;
- Providing the Conference of the Parties with information on measures undertaken to implement the Convention, their effectiveness and trade with intentionally produced POPs.

The Convention notes one more important procedure, in particular, expanding the list of POPs by including other chemical substances, as it will allow new threats to be identified on a timely base and appropriate measures to be taken to eliminate them.

In an effort to operate national programmes in countries with economies in transition, the Convention provides financial and technical assistance from developed countries. The Global Environment Facility (GEF) has been identified as the main structure for financing before approving a special decision by the Conference of the Parties.

The above-listed principles and obligations of the Stockholm Convention underlie the Stockholm Convention's National Implementation Plan on POPs in Kyrgyzstan (hereinafter NIP).

The basic goal of the NIP includes protecting human health and the environment from the influence of POPs and its main objectives are to eliminate and stopping the use of the POP pesticides shown in Annex A.

As regards PCBs, objectives have been laid down to stop using equipment that contains PCBs by 2025 and provide environmentally sound elimination of PCB by 2028. To achieve the tasks laid down, such as identifying the sources of releases and establishing control over them, administrative and legal safeguards should be provided.

As regards DDT (Annex B), the main aims are stopping the use of DDT, creating a register and assistance for research into and developing alternatives to DDT.

The NIP proposes solving the tasks by continuous reducing and, where possible, final elimination of all the releases of chemicals listed in Annex C including dioxins, furans, HCB, and PCB. To do so the effectiveness of the legislative base and existing environmental practices should be evaluated and alternatives sought and the necessary human and material resources should be developed.

In compliance with the Stockholm Convention obligations, the NIP pays significant attention to developing and applying environmentally sound management of stockpiles and wastes that contain POPs, including products and items that have been turned into wastes. As one of its important objectives, the NIP attaches great importance to conducting scientific research in the directions laid down in the Convention, in particular, methods and procedures for reducing of the use of and eliminating POPs, mitigating the influence of POPs on human health and the environment and monitoring the presence of POPs in humans and the environment.

According to preliminary results of the POPs-pesticide inventory, some areas in Kyrgyzstan contain soil in which the high levels of pollution that have been registered greatly exceed the maximum allowable concentration (MAC) norms. Consequently, according to the food chain, growing agricultural produce on polluted soil results in POPs-pesticides accumulating in humans. As a result, the presence of POPs-pesticides - DDT, and hexachlorocyclohexane, have been found in the majority of the tested samples of breast milk of women who live in rural areas in the south of the country. During the research into the environment, residual levels of DDT and products of its decomposition were identified in water taken from drainage networks and even from high-mountain lakes and glaciers located in the Tien-Shan.

Stockpiles of pesticides including POPs and opened illegally so called burial grounds of POPs

represent a permanent threat to the population and the environment.

Under the GEF/UNEP project to assist the Kyrgyz Republic in developing the NIP, a preliminary inventory was conducted during which a large quantity of equipment and significant volumes of oil containing PCBs were identified.

The problems regarding POPs are also complicated by the poorly studied issues related to unintentional dioxin and furan releases (PCDD, PCDF).

The Coordination Committee was created by Decree #688-p issued on November 14th 2003. by the Government of the Kyrgyz Republic to assist the Stockholm Convention on POPs issues in Kyrgyzstan. According to this Decree, the Ministry of Ecology and Emergency Situations of the Kyrgyz Republic (MEES) was appointed the coordinating and executive body.

When work began the NIP experts from the GEF/UNEP project on developing the National Plan conducted basic preparatory work in compliance with the requirements of the Stockholm Convention and the Interim guidance for developing a national implementation plan for the Stockholm Convention. Based upon the POPs preliminary inventory and an assessment of the opportunities for their elimination, the NIP priorities were identified. Special attention was paid to raising the awareness of all stakeholders on POPs issues both inside and outside government structures. The work on forming public opinion was conducted with the aim of social support the measures in the NIP. The NIP for the Stockholm Convention on POPs is not a totally independent environmental programme because POPs are only part of the toxic chemical substances that require environmentally sound management. It is independent only in implementing specific obligations under the Stockholm Convention and has been developed in accordance with national plans, priorities, and programmes.

The NIP is an integral part of the Complex Development Framework of the Kyrgyz Republic till 2010 (CDF) and the National Strategy for Poverty Alleviation (NSPA) because environmental problems caused by POPs are directly connected with poverty alleviation problems. The NSPA notes that the ecological situation in the Kyrgyz Republic has been aggravated due to economic problems provoking the population to destructively use natural resources that, according to the feedback principle, results in a significantly worse situation.

## **1. Country profile**

### **1.1. General information**

The Kyrgyz Republic is located in Central Asia between latitude 39° and 43° North and longitude 69° and 80° East. In the North, the republic boundaries the Republic of Kazakhstan, in the Southeast and East - the People's Republic of China, in the Southwest - the Republic of Tajikistan, and in the West - the Republic of Uzbekistan. The total length of the Kyrgyz Republic's boundaries is 4, 508 km and its area is 199, 900 km<sup>2</sup>. Of the republic's total area only 20% is in the relatively comfortable zone for living judged by biological and climatic factors and the vast majority of the population live in this zone; 35% of the area is a relatively uncomfortable zone, and 45% - a totally uncomfortable zone.

The capital city is Bishkek, founded in the 1860s that has a population of over 800, 000. Large cities include Osh, Jalal-Abad, Talas, Tokmok, Karakol, Kara-Balta, and Naryn.

As regards administrative and territorial divisions, the republic is divided into seven provinces of Batken, Jalal-Abad, Issyk-Kul, Naryn, Osh, Talas, and Chui. There are 40 rayons and 22 towns in these regions and Bishkek has four city districts.

The population of the republic is over five million people, 65% of whom live in the countryside.

Mountain-valley types of settlements are typical of the republic. Basically, the entire population of the country is concentrated in the flat valleys and basins where settlement took place when the area was opened up economically. Originally, these areas that are favourable biologically and climatically served as winter pastures for nomadic households and, in the early 20<sup>th</sup> century they started using this land for agriculture. The overwhelming majority of the republic's settlements are located in these places.

The climate is sharply continental; the average summer air temperature for the valley-pre-mountain zone is +20° - +27°C for July and the average winter air temperature (for January) varies from -1° and -8°C and

annual rainfall is 200-400 mm per year. In general, the annual long-term rainfall varies from 100 to 1,000 mm in the republic. The large volumes of atmospheric rainfall in the mountain and pre-mountain zones cause natural disasters including landslides, mudflows, snow avalanches and so on. This is the reason for the erosion of riverbanks and floods. Irrigated agriculture in the mountains causes extensive erosion of soil and waterlogging in settled areas. A feature of the hydrographic network is the general availability of natural exits for underground waters to the surface. Surface-stream flows form the basins of such rivers, as the Amu-Dariya, Talas, Chu, Ili, Tarim, and others. The basin of the high-mountain closed lake, Issyk-Kul is located within the republic (altitude 1, 608 meters).

In general, soils include grey and in the mountains - chestnut-coloured and mountain black soils. The climate of the valleys of Kyrgyzstan ripens valuable agricultural crops including cotton, tobacco, sugar beet, maize and so on. Because of this, significant areas of agricultural land were previously turned into single crop zones: the Fergana Valley - cotton, Talas - tobacco, Chui - sugar beet. To get high yields herbicides, insecticides, defoliants, growth regulators and various mineral fertilizers were systematically applied. As a result, the soil accumulated significant amounts of pesticides that pass through fodder into the livestock food chain and on into food products and finally into humans. Water is polluted through surface soil erosion and infiltration. Due to poor drinking water supplies for the country's population, especially in southern regions, water from irrigation systems is used for domestic purposes and drinking.

The vegetative (grass) cover is a forage resource for pasture livestock breeding. Intensive use of pastures under the planned economy resulted in their degradation. Forests cover about 4% of the republic. Mountainsides and valleys are the source of medicinal herbs.

Kyrgyzstan is an agrarian and industrial country. Agriculture is the leading branch of the economy accounting for almost 35,2% of GDP and over 50% of the able-bodied population of the republic is involved in it. Industry accounts for 18% and services - 35.1% of total GDP. Agriculture's base includes various livestock breeding sectors including meat, dairy and wool production, growing tobacco, cotton, grain, forage crops, vegetables and fruit and beekeeping. The main branches of industry include hydropower, iron-ferrous metallurgy and ore mining including the extraction of mercury, antimony, gold and rare metals and the light and food industries.

## **1.2. Ecological situation in Kyrgyzstan**

Kyrgyzstan is a mountainous country with a large variety of landscapes, animals and plants, with really high mountain peaks, large glaciers and permanent snow. Altitudes in the republic vary from 350 to 7, 439 meters and 94% of its land mass is over 1, 000 meters above sea level, of which 40% is higher than 3, 000 meters. The average altitude in Kyrgyzstan is 2, 750 m. Anthropogenic ecological systems occupy only 7% and the rest are inviolate or weakly affected natural ecological systems. 23% of the area is higher than 3, 500 meters and there is a glacial nival zone with permanent snow and glaciers. Almost 15% of the land has stony, crushed stony, and clay soils that are basically barren.

The Kyrgyz Republic is subject to hazardous natural processes, such as earthquakes, landslides, mudflows, flooding and rock falls, landslips, snow avalanches and others. For example, seismic stations register over 3, 000 earthquakes and there are almost 3, 000 landslides annually.

Earthquakes and landslides especially in mountain canyons where rivers flow can cause natural barriers, dams and reservoirs, the breaching of which can cause powerful mudflows and floods washing out parts of roads and buildings and change the directions of riverbeds. Mudflows and floods are serious dangers as they occur throughout the republic after storms, snowmelt and breaches in high mountain lakes. Of 2,000 high mountain lakes, over 200 are hazardous and their number is constantly increasing. Over 3, 900 river basins are hazardous because of mudflows.

Kyrgyzstan is a high mountain country that has ecological systems that are especially vulnerable to external anthropogenic influences. Economic problems, that push the population to destructively use natural resources including deforestation, poaching, extensive use of arable land, scorning irrigation norms and other measures, aggravate the unfavourable environmental situation.

Unique landscapes and sources of pure fresh water that are untouched by economic activities have been partly saved in Kyrgyzstan. The republic is the main zone for forming the water resources for states of the Aral Sea area. Weather processes in the zone of permanent snow and glaciers of the Tien-Shan

influence the climate of Central Asia. The republic has been experiencing the consequences of the ecological crises in recent years. Glaciers are melting rapidly, deserts are expanding and forests and the unique biological diversity are disappearing.

The diversity of ecological systems is unevenly spread throughout the country and is more widely represented in the Western and Central Tien Shan bio-geographic areas where 16 out of 22 classes of ecological systems are represented, 72.7% of their entire diversity. The Ferghana and Southern Kazakhstan areas are especially poor in this relation, as only 3-5 classes of ecological systems or 22.7% are represented in these areas. Between these areas, there is the Alay area representing 13 classes of ecological systems or 59.1% and the North Tien-Shan, Issyk-Kul, and Central Tien-Shan areas representing 10 classes of ecological systems each, or 45.4%.

The Republic is one of the 200 most important ecological regions on the planet due to its concentration of species diversity of flora and fauna. Thus, almost 2% of the world's flora and 3% of its fauna can be seen here, whereas the area of Kyrgyzstan is only 0.13% of the world's land mass. According to the classification approved by the International Union for Conservation of Nature and Natural Resources (IUCN) specially protected natural areas (SPNA) of the republic fall into four categories:

1<sup>st</sup> category - seven reserves covering 270, 700 hectares where all economic and other activities are prohibited, as they destroy the natural development of natural systems.

2<sup>nd</sup> category - eight State national nature parks covering 258, 500 hectares with different levels of protection, including reserve, recreation and economic use zones;

3<sup>rd</sup> category - natural monuments or 60 geological reserves in the republic (60 hectares)

4<sup>th</sup> category — reserves (forest, botanical, hunting) that have been created to protect individual natural resources and two complex reserves covering more than 283, 000 hectares.

The Issyk-Kul biosphere covering 4, 314, 400 hectares established in 2000 has the status of a specially protected area at national level in accordance with the legislation of Kyrgyz Republic.

Forests cover 4% of the republic and they play an important role in preserving the biological diversity and stability of ecological systems and are soil- and water-preserving forests. However, the area of forests has been permanently shrinking for the last 50 years.

Water ecological systems are especially significant, as they are sources of freshwater and recreation facilities. Of them, Issyk-Kul Lake has the largest recreation potential not only within the country but also on a regional and even world scale in future.

Water resources are strategic, as they are vitally important and have governmental significance. Kyrgyzstan has large reserves of fresh underground and surface water that are concentrated in lakes, rivers, permanent glaciers and snow bodies. The more than 3, 500 rivers in the republic provide neighboring states, such as Tajikistan, Uzbekistan, Kazakhstan, and even the Xinjiang Uygur autonomous region of China, with water. There are a significant number of lakes and other natural water reservoirs in the republic covering almost 6, 700 km<sup>2</sup> and an annual water capacity of approximately 1,745 km<sup>3</sup>.

Air and water pollution mainly depend on the economic status of branches that have the largest influence on the environment, including energy industry, construction materials producing industry, municipal economies, ore mining and processing industries, private sector and vehicles.

### **1.3. Environmental management at government level**

After the Kyrgyz Republic obtained its sovereignty measures were carried out to enhance the effectiveness of state management in solving environmental problems and creating a legislative base for environmental management. Over 30 laws and codes and 40 bylaws to protect human health and the environment, have been approved. A number of national environmental programmes are being carried out now in the Republic, as they are closely linked with the social and economic strategies. Since independence, the Kyrgyz Republic has been taking an active part in international, sub-regional, regional, bilateral and multilateral cooperation through signing eight and ratifying five international conventions, such as the *Rotterdam Convention on the prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International trade*; *The Vienna Convention for the Protection of the Ozone layer* and *The Montreal Protocol on Substances that deplete The Ozone layer*; *the International Labour Organization Convention on Labour Safety and Hygiene in Agriculture*; *UN Framework Convention on Climate Changes* and *the Kyoto Protocol*; *Convention on the Prohibition of the Development, Production,*

*Stockpiling and Use of Chemical Weapons and on their Destruction.* On May 16th 2002, Kyrgyz Republic signed the *Stockholm Convention on persistent organic pollutants* and ratified it on July 19th 2006, thus demonstrating its aspiration to cooperate with the international community.

The State Agency for Protecting the Environment and Forestry under the Government of the Kyrgyz Republic (hereinafter - SAPEF) was established by Decree #462 of the President of the Kyrgyz Republic dated October 15th 2005, *To Improve State Governance Bodies in the Kyrgyz Republic* and is based on the State Forestry Service of the Kyrgyz Republic and National Centre for Developing Mountain Areas that has functions related to the ecology, appropriate personnel and funding from the Ministry of Ecology and Emergency Situations of the Kyrgyz Republic. The SAPEF is an assignee of the above-mentioned state bodies and is also an executive body in implementing the obligations of the Kyrgyz Republic under international nature conservation conventions. In accordance with the Provisions of the SAPEF under the Government of the Kyrgyz Republic approved by Resolution #617 issued on December 26th 2005, *Issues of the State Agency for Environmental Protection and Forestry* under the Government of the Kyrgyz Republic, SAPEF is the republican state body for environmental protection and forestry management that conducts a unified policy on environmental protection, saving biological diversity, rational use of natural resources, development of mountain areas, forestry and hunting and provides the state with ecological safety.

Other ministries and agencies of the republic carry out the appropriate regulation of issues on the POPs problem. The objective for local governments includes undertaking measures on environmental protection within the legislation of Kyrgyz Republic in close cooperation with the appropriate state management bodies.

## **2. NIP principles**

The main principles of the NIP on POPs are as follows:

- Priority to protect the health of the current and future generations from the adverse effects of factors polluting the environment;
- Priority of issues related to the natural environment when making political and economic decisions;
- Improving the environmental legislation, standards and norms when conducting economic reforms and when carrying out economic activities taking into consideration international experience to prevent and/or reduce environmental backlash;
- Interdepartmental interaction and implementing joint measures on protecting the environment from pollution;
- Legislatively reinforced mutual responsibilities by executive authority bodies for the state of the environment and natural resources.

Three factors were taken into consideration when developing the NIP: First of all, the NIP should consider the Stockholm Convention's requirements and be a document that shows how the obligations laid down by the Convention will be implemented by the Kyrgyz Republic.

Secondly, the NIP is part of national programmes, such as CDB, NSPA, the National Action Programme on Environmental Protection, the National Action Programme on Environmental Hygiene, and the State Programme on Utilizing Production and Consumption wastes. The NIP and other national environmental projects should be complementary and the NIP development and implementation should be integrated into an overall national system for the sound management of chemical substances, as it would provide obligatory observance of precautions, prevention and systematic control of pollution. POPs monitoring should be a harmonic part of the national system for ecological monitoring. POPs should be a separate part of all directions of ecological policy including the overall procedure for state bodies' reporting on chemical substances, in systems of raising the population's awareness about the environmental situation, forming social assistance for nature conservancy programmes, training staff and creating a material, technical and scientific base.

Thirdly, POPs are a problem that affects not only human health and the environment protection but also agriculture, industry, science, social protection of the population including poverty alleviation,

unemployment, and so on. For example, reducing POPs influence on farming will not only improve farmers' health but also produce competitive produce, the sales of which will raise villagers' incomes.

Other important issues that were taken into consideration when working out the NIP include:

**Involving all interested parties/stakeholders and dividing their responsibilities.** The NIP will only be effective and successful where representatives of government structures, NGOs, scientists, farmers, engineers, workers, and international organizations all participate in its activities. There are a large number of subjects, the interests of which often contradict each other, in the chemical substances management sphere and because of this, it is very important to coordinate their interrelations and identify joint actions. At the same time, each stakeholder accepts a certain share of personal responsibility in developing and implementing the NIP.

**Reality.** The NIP should reflect the realities of the environmental situation and establish clear and accomplishable tasks. To evaluate the existing situation groups of experts were created that consequently, in phases, carried out specific tasks on various aspects of this problem in compliance with the recommendations of the Interim guidance for developing a national implementation plan for the Stockholm Convention issued by the UNEP Chemicals and the World Bank. A preliminary POPs inventory was conducted and it identified the goals, objectives, and priorities for the National Strategy on Limiting and Eliminating POPs and making specific programme activities in various sectors.

**Applying international experience** makes it necessary to consider the requirements of other conventions (Rotterdam, Basel), recommendations from international organizations, information from international scientific centres, and to expand regional and sub-regional cooperation.

**Introducing systematic information exchange.** To effectively implement the NIP information exchange methods between involved parties at national and international levels should be worked out and introduced.

**Searching for and introducing effective and inexpensive methods for solving tasks.** Kyrgyzstan is in a very difficult economic situation and considering that eliminating the consequences of POPs is an expensive procedure, preventive measures that save money and materials should be found.

**Information accessibility and wide information dissemination for the population.** These principles give communities access to information about POPs, consequences of their use and measures conducted by government structures on limiting and eliminating POPs. At the same time, based upon the feedback principle, the relevant government structures can correct their work and invite communities to solve these or those issues as far as delegating some functions to community organizations.

The NIP also contains ways of controlling and evaluating implemented actions, as they use a system of measurable indicators that enables objective assessment of the situation at a certain stage when implementing the NIP and identifying factors that promote or create obstacles to successfully solving tasks established by the NIP.

### **3. Evaluating the environmental situation regarding POPs**

#### **3.1. Analysis of the normative and legal base on chemicals and POPs management**

The existing system of dividing chemical substances in the republic (pesticides, highly toxic substances, waste products from production and consumption, potentially toxic chemical substances, oil products, medicines, dumps and tailing dumps' wastes) proves the lack of clearly defined categories for specific substances. Some chemical substances fall into different categories. For example, pesticides with an expired shelf life including aldrin, dieldrin, and prussic acid and its salts in tailing dumps are on the list of highly toxic substances and so on. As a result, various legal mechanisms can be applied to the same chemicals when regulating their use.

The basic weakness of the legal regulation in the POPs sector is the lack of a normative legal base. There are no any legal, organizational measures and technical opportunities for controlling and regulating unintentionally produced POPs. There are formal opportunities to control releases of unintentionally produced POPs based on the 'polluter pays' principle. However, the lack of a number of approved methods for calculating release volumes prevents control and registration because measurement of

unintentionally produced POPs is expensive.

To a larger degree, requirements regarding chemical substances use are of a general ecological character predetermining the basic requirements to any type of economic activities regardless of the specific nature of using a considered substance or group of substances.

### **3.2. Ministries, agencies, and other institutions of the republic that control chemicals and their functions**

**State Agency for protecting the Environment and Forestry under the Government of the Kyrgyz Republic.** Main goals and objectives of the SAPEF include:

- Developing and implementing a unified government policy and main directions for environmental protection, conservation of biological diversity and forest ecological systems, developing an SPNA network, rational use of natural resources, sustainable development of mountain areas and ensuring the state's ecological security;
- Organizing and implementing government control over environmental protection, natural resources use, preserving biological diversity and the following nature-conservancy legislation;
- Implementing the main documents approved by the UN in global ecological conventions and issues related to developing mountain regions;
- Implementing the Republic's obligations together with other interested ministries and agencies responsible for implementing nature - conservancy conventions, projects and programmes that are carried out with both technical and financial support from donors and international organizations.

The SAPEF carries out government control of:

- Environmental protection and natural resources use including atmospheric air protection;
- Production and consumption of ozone- depleting substances;
- Using and protecting water resources, land, plants, animals, fish stocks and their habitat; protecting and preserving forests, activities in SPNA, recycling production and consumption wastes and trans-border movement of wastes including radioactive wastes.

Under the established procedure the SAPEF issues and cancels the following:

A) Licenses for the following types of activities:

- Use, location, destruction and burial of toxic materials and substances including radioactive ones;
- Transport (including trans-border) of wastes from producing toxic substances;

B) Special permits to do the following:

- Pollutant releases into the environment;
- Discharge pollutants in the environment;
- Disposing of wastes in the environment.

**Ministry of Emergency Situations of the Kyrgyz Republic** develops and implements a unified policy to prevent industrial accidents, for applying highly toxic substances (State Mining and Technical Supervision - Gosgortehnadzor), hydro-meteorological services and control over the state of the environment. Kyrgyzgidromet (Kyrgyz Hydro Meteorological Centre) makes systematic weather, hydrological, agronomic, meteorological, the state of agricultural crops and pasture grasses observations, analyses of the state of the environment and tendencies of developing processes and, based upon these results, forecasting extremely high levels of environmental pollution and notifying government structures and economic entities about these events.

**Ministry of Health of the Kyrgyz Republic** carries out unified governmental policy on preventing the harmful influence of chemical substances on human health and people's habitat, registers toxic chemical substances, coordinates overall policy on the safety use of chemical substances, manages the National Register of Potentially Toxic Chemical Substances in the republic, carries out monitoring of pesticides including POPs and analyses sickness rates among the population.

**Ministry of Agriculture, Water Resources and Processing Industry of the Kyrgyz Republic (MAWRPI)** manages a unified policy and carries out necessary measures on applying fertilizers and pesticides in agriculture and control over the concentration of chemical substances in food products and is also involved in protecting water assets from pollution with chemicals.

**Ministry of Labour and Social Protection of the Kyrgyz Republic** manages a unified government policy on labour protection when producing and applying chemical substances.

**Ministry of the Economy and Finance of the Kyrgyz Republic** finances all chemicals' management actions at republican level.

**Ministry of Transport and Communications of the Kyrgyz Republic** implements necessary measures and develops rules on any type of transport of chemical substances.

**Ministry of Industry, Trade, and Tourism of the Kyrgyz Republic** responsible for elaborating and implementing industrial policy and issues related to standardization and metrology.

**Ministry of Interior of the Kyrgyz Republic** organizes and implements government control over the illegal application of chemical substances.

**Ministry of Defence of the Kyrgyz Republic** organizes and controls the production and application of chemical substances in the defence sector and controls the processing of wastes.

**Ministry of Justice of the Kyrgyz Republic** carries out governmental registration of all normative-legal statements related to chemical's management.

**State Agency on the Registration of Rights to Immovable Property under the Government of the Kyrgyz Republic** carries out government role of the use and protection of land and following the land legislation.

**State Agency on Geology and Mineral Resources under the Government of the Kyrgyz Republic** carries out governmental control over the rational use and conservation of mineral resources, including chemical substances.

**Drug Control Agency of the Kyrgyz Republic** prevents the harmful influence of drugs, psychotropic substances and other medicines on human health and habitat and coordinates overall policy on the safe use of these substances.

**State Electricity and Natural Gas Inspectorate under the Government of the Kyrgyz Republic** organizes and carries out the necessary measures for producing and applying chemicals in the fuel-energy complex and wastes processing.

**State Agency on Intellectual Property under the Government of the Kyrgyz Republic** controls a unified scientific and technical policy on issues related to the production and application of chemical substances.

**State Customs Inspectorate under the Government of the Kyrgyz Republic** regulates exports and imports of chemical substances and toxic wastes.

The existing system for regulating chemical substances dividing them into pesticides, highly toxic substances (HTS), production and consumption wastes, potentially toxic chemical substances (PTCS), oil products, medicines, dumps and tailing dumps wastes determines the management of chemical substances.

The Chemical, Protection, and Plant Quarantine Department of the MAWRPI controls the pesticides and agricultural chemicals that can be used in the Kyrgyz Republic and keeps a government list.

The Interior Department controls the application of HTS, whilst at the same time, the Ministry of Emergency Situations of the Kyrgyz Republic controls HTS storage, registration, and use during the production cycle.

SAPEF keeps records on four classes of wastes - extremely toxic, highly toxic, hazardous and slightly hazardous.

The Ministry of Emergency Situations of the Kyrgyz Republic keeps a register of tailing dumps and dumps that contain wastes of mineral resource industry.

The Ministry of Health of the Kyrgyz Republic controls and registers medicines. PTCS, with the exception of pharmaceutical preparations that are produced in the republic or abroad to be used in economic and domestic activities, are subject to government registration.

Chemical and biological substances that are potentially dangerous to human health and some types of production are allowed only after government registration. After a substance is recognized as potentially hazardous for human health and the environment it is given a special registration number. A name is given in compliance with the rules approved by the International Union for Pure and Applied Chemistry (IUPAC) and a CAS (Chemical Abstract Service) registration number is given in an effort to identify

PTCS in similar registers, including the International Register for Potentially Toxic Chemical Substances kept by the WHO.

The Medical Epidemiological Supervision Department (hereinafter - MESD) of the Ministry of Health of the Kyrgyz Republic registers PTCS. The register has been kept since 1996 and at the end of 2003 it contained 597 entries.

A unified government reporting system on both POPs and other toxic chemical substances is lacking and there is no inventory of substances that are identified as POPs. A unified information system on POPs and other toxic compounds management is lacking. Reducing the risks connected with POPs and other toxic compounds can be achieved by establishing interdepartmental and inter-sectoral partnerships when managing POPs and other toxic compounds.

### **3.3. Evaluation of problems regarding pesticides, including the list of POPs**

POPs-pesticides have never been produced in the republic. POPs-pesticides were delivered centrally through Kirgizselhozhimiya (Kyrgyz Agricultural Chemistry) that previously was part of Souzselhozhimiya (Agricultural Chemistry Union), USSR. According to official data, POPs-pesticides have not been imported and then re-exported from the republic during the last 15 years. Their use in agriculture was prohibited over 20 years ago on the instructions of the former Ministry of Health of the USSR.

To control pests, weeds, and pathogens almost 5, 000 tons of pesticides were used annually in the republic and their rates of applications were up to 10 kilos per hectare and POPs-pesticides accounted for 30% of the total quantity. The peak of POPs-pesticide use was in the 1970s and 1980s. At the end of the 1980s, almost one million hectares of crops including cotton, sugar beet, vegetables, tobacco, grain crops, gardens, vineyards, and pastures were being sprayed with chemicals. In general, the pesticide load on fields was over 5 kilos per hectare.

By the end of the 1980s the total supplies of pesticides fell. In many respects, this was connected with introducing more effective preparations with significantly lower rates of application per hectare. Further reduction in pesticide supplies occurred as a result of both the broken previous economic links due to the collapse of the USSR and reduced purchasing capacity of agricultural enterprises. Lack of proper control and low living standards of the rural population creates a basis for smuggled deliveries of POPs-pesticides, especially in near-border areas of the republic.

**The Inventory of stockpiles** of prohibited for use or pesticides with expired shelf lives, was carried out by field studies of the locations where they are stored, used or buried throughout Kyrgyzstan. When conducting the inventory, the *Technical Manual for Conducting an Inventory, Identifying, Collecting and Storing Pesticides that Are Obsolete and Prohibited for Use* (approved on June 25th 2003 by the MAWRPI) and recommendations from the *Interim guidance for developing a national implementation plan for the Stockholm Convention* prepared by the World Bank and UNEP Chemicals (2004), were taken into consideration.

According to preliminary data, as a result of the inventory of places where Selhozhimiya (Agricultural Chemistry) stores were formerly located, former stores on collective farms, agricultural aviation airfields, 104, 683 kilos of obsolete pesticides were found including 30, 206 kilos in Osh region, 42, 386 kilos in Chui region, 9, 091 kilos in Issyk-Kul region, and 23, 000 kilos in Naryn region. According to the preliminary inventory, the total of POPs-pesticides in the republic comes to 20.68% of the total amount of the obsolete pesticides found.

In future, it will be necessary to identify stockpiles of unlabeled pesticides or their mixtures of unknown composition that account for more than 21% of the total of pesticides with an expired shelf life. These pesticides were distributed in three regions, Chui, Issyk-Kul, and Naryn. The most important task is identifying the percentage of POPs-pesticides in the total volume of unknown pesticides. The quantities of obsolete pesticides could be significantly larger, as there could be various quantities stored on private farms.

Pesticide stores were studied at the same time as the inventory to identify obsolete pesticides was conducted. A total of 113 stores were inspected, although, according to data from the MESD of the

Ministry of Health of the Kyrgyz Republic, 183 stores of poisonous chemicals existed in 2003 and 92 of them did not meet medical norms. Of the total number of investigated stores only 21 are still used for their original purpose and the rest have been demolished for construction materials and/or they have been fully or partly destroyed or re-equipped to be used for other purposes.

The risk of the harmful impact of pesticides on human health increases when they are not stored properly, thus resulting in pollution of the surrounding land. Former stores for fertilizers and pesticides located in the Ton and Jety-Oguz areas, Issyk-Kul region, require special attention, as they are located in the resort zone of Issyk-Kul Lake and represent a real source of pollution of the lake.

Attempts have been made to bury prohibited pesticides or pesticides with expired shelf life in so called burial grounds. In 1973 places for burying such pesticides including POPs were designated 12 kilometres from Kochkorka village, Kochkor area, Naryn Region and in 1980 in the Suzak area, JalaJ-Abad Region next to Kyzyl-Bairam village, and in the Ak-Chabyr area. After 1973, 272 tons were buried next to Kochkorka and later on, from 1979-1990, 308.5 tons were buried in an area covering 5, 000 m<sup>2</sup>. DDT accounted for 293 tons of these pesticides. As regards the Suzak area, 1, 295.88 tons are buried here including 655 tons of DDT and 69.5 tons of aldrin. The burial area covers 10, 000 m<sup>2</sup>.

1, 876.38 tons of pesticides including 1, 033.4 tons of POPs-pesticides were buried in the republic. Aldrin, HCCN, DDT and products of its decomposition, dieldrin and heptachlor have been found in the areas around these burial grounds. Residues of pesticides listed above in the soil of these studied sites ranged from insignificant to 112 - 616.3 milligrams per kilo of soil. Some concrete pits and burial mounds were open and pesticide packaging lay on the surface so the soil has become mixed with pesticides. Burial areas were not fenced off and marked with any warning signs. In 2002, an attempt was made to illegally open the burial ground in the Suzak area. As a result, people and animals were poisoned.

Up to 60% of all protective measures in agriculture in the Republic concerned the use of aviation from 1970 to 1991. Airfields were not used just for take-offs and landings of airplanes but also for preparing mixtures of pesticides, loading airplanes with these mixtures, and other technological procedures. To evaluate the condition of airfields and their real influence on the environment, the inventory investigated and identified their locations. As a result of this inventory, 46 airfields were identified, although 44 such airfields were in use in the Osh region alone in 1981. The study showed that airfields with dirt runways and areas next to hard surface airfields are being used for cultivating agricultural crops and some of them have been given to residents for house building. Due to their high level of pollution with POPs-pesticides, these airfields are still sources of negative influence on human health and the environment.

**Soil contamination.** Analysis of long-term observations has shown that the level of soil pollution with DDT and products of its decomposition is quite high in the republic. Out of all the regions and taking into consideration the intensiveness of agriculture and the variety of agricultural crops, Osh and Jalal-Abad regions have high levels of soil pollution, Chui region – average pollution level, Talas and Issyk-Kul regions - low pollution levels. The most contaminated areas (DDT and products of its decomposition) were those sown with cotton and tobacco and gardens. The monitoring results showed that the concentrations of DDT and products of its decomposition in soil remained the same between 1986 and 1992 even though DDT was officially not being used anywhere then.

In 2005, spot samples for DDT and products of its decomposition from drainage networks (hereinafter, - DN) were taken in Naryn, Talas, and Issyk-Kul regions, the areas where the majority of rivers in the country form. As a rule, DN water passes into rivers or reservoirs and can be a potential source of pollution. DDT and products of its decomposition were identified in all samples of water in concentrations ranging from insignificant to more than ten times MAC. The Naryn River that forms in the republic has a catchment basin of 53, 700 km<sup>2</sup> or 27% of the republic's landmass. When flowing into the Kara-Dariya River outside the republic in Uzbekistan the Naryn River forms the Syr-Dariya River, which is the second largest in Central Asia and the Talas River flows into Kazakhstan. In both cases, the rivers are sources of transboundary transport of POPs-pesticides. The Dzhuukuchak and Ak-Sai rivers flow into Issyk-Kul Lake and are its potential pollutants.

Results of the preliminary inventory of POPs-pesticides are as follows:

- 104, 683 kilos of pesticides with expired shelf life were found, of which, 31, 851 kilos are

- POPs and 21, 647 kilos (litres) of unknown pesticides need further identification;
- There are 1, 876, 380 kilos of pesticides in two dumps, including 1,033,400 kilos of POPs-pesticides; the dumps covering layers are damaged and there are no fences or warning signs;
- Illegal POPs-pesticides are smuggled into the country or stolen from old dumps and probably from stockpiles held on private farms;
- Pesticides are stored in warehouses that do not meet safety requirements or have been partly destroyed; pesticide packaging is damaged and the pesticides are washed away by rain and pollute the adjacent land, surface and underground water;
- Construction materials from demolished or ruinous former stores are used to build residential houses, mosques and buildings for domestic animals; former stores are used for storing agricultural produce;

Former airfields and land adjacent to them are being used for housing and/or cultivating agricultural crops;

- Due to the intensive use of POPs-pesticides a high level of pollution still occurs in DN discharge water;
- Soil monitoring shows that the level of soil pollution with DDT and products of its decomposition is still high despite it being banned in 1970.

### 3.4. Regulatory base

Use of chemical substances including pesticides is regulated by a number of legislative and normative documents of the Kyrgyz Republic. They include the laws of the Kyrgyz Republic *On the Medical and Epidemiological Well-being of the Population, On Fertilizing and Protecting Plants, On Environmental Protection, On Atmospheric Air Protection* and a number of others, in particular:

- Resolution #376 of the Government of the Kyrgyz Republic dated July 27th 2001, *On Measures on Environmental Protection and Protection of People's Health due to the Unfavourable Influence of Some Hazardous Chemicals and Pesticides*;
- *List of Pesticides and Agricultural Chemicals Allowed in the Kyrgyz Republic between 2000 and 2004* that is reviewed every five years by MAWRPI;
- *Instructions on the Safe Use, Storage, and Warehousing of Pesticides in Agricultural Production* (approved by Order #309 of the MAWRPT of the Kyrgyz Republic dated November 20th 2001);
- MRN 1.2.1077-01 *Hygienic Requirements for the Storage, Application, and Transportation of Pesticides and Agricultural Chemicals* (approved by Resolution #31 issued by the Chief State Medical Doctor on May 2nd 2003);
- MRN 1.1.002-03 *Hygiene Requirements for the Production of Pesticides and Agricultural Chemicals* (approved by Resolution #10 by the Chief State Medical Doctor of the Kyrgyz Republic on February 20th 2004 and registered in the Ministry of Justice of the Kyrgyz Republic, Registration Number 37-04 dated March 19th 2004);

*Hygiene norms for the content of pesticides in environmental objects (a list)* (approved by Resolution #20 issued by the Chief State Medical Doctor of the Kyrgyz Republic on May 28th 2004 and registered in the Ministry of Justice of the Kyrgyz Republic, Registration Number 64-04 dated June 10th 2004);

- Due to the intensive use of POPs-pesticides a high level of pollution still occurs in DN discharge water;
- Soil monitoring shows that the level of soil pollution with DDT and products of its decomposition is still high despite it being banned in 1970.
- MRN 2.1.7.005-03 *Medical Epidemiological Requirements for Soil Quality* (approved by Resolution #9 issued by the Chief State Medical Doctor of the Kyrgyz Republic on February 20th 2004) and others.

Both natural persons and legal entities that circulate pesticides at all stages of their production, storage, transportation, sale, application, utilization and destruction are responsible for following hygiene norms related to the content of pesticides and their products of decomposition in the environment.

Control over observance the established hygiene norms of pesticide content in agricultural outputs is

based on information on applying pesticides when producing, storing, and transporting such outputs and control over pesticide residues in the environment including water, soil, and air is based upon the information on applying pesticides.

Control and registration over the movement of substances including POPs across the republic's boundaries is carried out by the Customs in line with the requirements of Resolution #193, *On Measures for Controlling Transboundary Transportation of Hazardous and Other Wastes*, issued by the Government of the Kyrgyz Republic on April 6th 1999, in compliance with the republic's obligations under the Basel Convention.

There are no special norms on controlling and registering the transportation of POPs in compliance with obligations under the Rotterdam Convention except Resolution #376, *On Measures on Environmental Protection and Protecting Human Health from the Unfavourable Influence of Some Hazardous Chemicals and Pesticides*, issued by the Government of the Kyrgyz Republic on July 27th 2001.

Control over using chemicals is in the remit of the Ministry of Health of the Kyrgyz Republic and is directly imposed on the State Medical and Epidemiological Supervision Department of the Ministry of Health of the Kyrgyz Republic, State Agency on Environmental Protection and Forestry under the Government of the Kyrgyz Republic, Ministry of Emergency Situations of the Kyrgyz Republic, the Department for Chemicals and Plant Protection and Quarantine (CPPQD) of the Ministry of Agriculture, Water Resources and Processing Industry of the Kyrgyz Republic. Obligations of ministries and departments on controlling the distribution of chemicals are predetermined by the specific character of their activities including healthcare, environmental protection and so on and depend not on the type of substance but the area of use.

### **3.5. Assessment of PCB issues**

PCBs have never been produced in the Kyrgyz Republic but could be brought into the country in electro-technical equipment, transformer oil, paints and grease. There is no precise information on the import or export by quantity and types of electro-technical equipment, volumes and sorts of transformer oils, paints and other materials. Electro-technical equipment and oils are used in power engineering, coal mining, metallurgy and machine-building and producing construction materials, mainly in the energy sector

Discovering equipment that can contain PCBs, such as transformer capacitors and oils, was initially done by the type and name of equipment and sort of oil. In the course of taking the inventory, information was collected about the distribution of transformers, capacitors, transformer and capacitor oils by industrial entities and branches of the Kyrgyz Republic.

According to the results of the preliminary inventory in the Republic there are: - transformers - 19, 230 units; transformer oil - 14, 285.435 tons;

transformer oil stocks - 139.662 tons;

- capacitors - 2, 373 units; capacitor oil - 24.407 tons, including – two TNZ 1000/10 transformers in Tokmok at Interglass Ltd with 2.2 tons of PCB-contaminated material, - 789 KS-2, KS-2A, KSK capacitors with 18.8 tons of PCB-contaminated material (the majority has a working life of more than 25-30 years).

Chromatography-mass spectrometry analysis of transformer oil samples from these two transformers showed that only one of them contains PCB-contaminated oil. It is impossible to define the presence or absence of PCBs in the other transformers, transformer and capacitor oil, stockpiles and wastes based only on equipment type or sort of oil. There is no information on the methods for the environmentally sound disposal of decommissioned equipment and oils and methods of preventing oil leaking into soil. There is a strong possibility that oils used in transformers and in stockpiles could be contaminated with PCBs due to improper handling. Maintenance personnel are not informed of the danger to health when working with polluted or PCB-containing transformers, capacitors and oils.

The level of awareness of decision-makers and operating personnel about maintaining PCB-contaminated equipment and material is very low:

- There is no clear allocation of responsibilities among ministries and departments about PCB management;
- There is no reliable information on the volumes of PCBs in working and decommissioned equipment, on equipment polluted with PCBs, on stockpiles of PCBs and polluted sites or on PCB content in foodstuffs;
- There has never been control of PCBs content in the environment due to the lack of the proper equipment. MAC levels of PCBs in water, soil, air and foodstuffs are not denned in law.
- There are no programmes for monitoring PCBs in the environment and, accordingly, no evaluation of adverse effects on human health and the environment.

### **3.6. Assessment of DDT issues**

DDT has never been produced in the Kyrgyz Republic and the USSR Ministry of Healthcare prohibited its use in 1970. However, for some years after official prohibition DDT was used not only for pest control but also to control natural focuses of plagues in the Republic. From 1971 to 1989 about 1.8 mln hectares were treated in two natural focuses of plague.

DDT is not on the list of pesticides and agrochemicals allowed in the Kyrgyz Republic but stockpiles discovered in warehouses in the course of the preliminary inventory totaled 31, 740 kg. Since the use of DDT was prohibited more than 30 years ago the majority of the archive data about supplies has not been kept. According to experts DDT is still used on some individual farms possessing small stockpiles.

From 1986-1992 Kyrgyzhydromet (Hydro-meteorological service) monitored pesticide residues in soil, including those from DDT, hexachlorocyclohexane and its isomers. Water and soil samples were taken at the same test sites at definite time intervals. Of the 29.9 thousand hectares, 7.6 thousand hectares or 25 % of the examined area were polluted with DDT. This fact confirms the resistance of DDT and products of its decomposition to degradation and cannot be used for assessing a quantity of DDT-polluted areas.

Monitoring results showed that levels of DDT and products of its decomposition have remained the same throughout the whole period of observations even though DDT has not been used anywhere officially.

### **3.7. Assessment of problems of unintentional POPs releases (PCDD/PCDF, PCB)**

A calculated evaluation of unintentional releases of dioxins and furans (PCDD, PCDF) by sources leading to their generation was done in the course of preparing the NIP. In 2003 the total releases of dioxins were 30.5 g TEQ, of which releases into the air accounted for 14.37 g TEQ or 47.11%, into water - 10.87 g TEQ or 35.63 %, into soil - 0.16 g TEQ or 0.52%, contamination of produce- 0.03 g TEQ or 0.1% and the residue was 5.08 g TEQ or 16.64 %.

The majority of releases are the result of combustion procedures, including domestic wastes, production of minerals, domestic heating, fires, electricity and heat generation and the greatest contribution is made by incinerating medical wastes - 7.01 g TEQ. Releases into water are from sewage and untreated water discharges into open reservoirs. The residue is formed from fly ash, burning solid fuels in domestic ovens and sludge from wastes disposal plants. The total volume of release of dioxins/furans varies proportionally to production activity, which is shown by the dynamics of changes in releases, when from 1990 - 1995 their volume fell by three times and then in the following 10 years, doubled.

There is a great degree of uncertainty in the calculations due to the lack of accurate data on burning agricultural biomass, domestic wastes in homestead lands, fires in houses and industrial premises, burning in dumps and leaching after rainwater/snow on dumps and disposal points.

Thus, results of the preliminary inventory of unintentional releases of dioxins/furans (PCDD/PCDF) are as follows:

- the majority of releases into the air arise from burning medical wastes and water pollution from the discharges of untreated water;
- measurements of dioxins/furans in the environment, human body and control over their sources

- have never been carried out for lack of an appropriate equipment;
- MAC of dioxins/furans in water, soil and foodstuffs, except the air of inhabited areas, are not denned in the legislation.

### 3.8. Requirements for exemption

The Kyrgyz Republic, as a country that has ratified the Stockholm Convention, according to the requirements of Article 3 *Measures to reduce or eliminate releases from intentional production and use* is obliged to: «...a) prohibit and/or take the legal and administrative measures necessary to eliminate:

- production and use of the chemicals listed in Annex A subject to the provisions of that Annex; and
- import and export of the chemicals listed in Annex A in accordance with the provisions of paragraph 2».

As for the requirements of Article 4, *Register of specific exemptions* of the Convention the Kyrgyz Republic is obliged not to use DDT anymore as a means for disease vector control.

### 3.9. Evaluation of the monitoring system in the Kyrgyz Republic

In the Kyrgyz Republic monitoring the pollution of the environment, foodstuffs and human body for persistent toxic substances began in the 1970s and was carried out by the hydrometeorological service of the Republic and the Ministries of Agriculture and Healthcare.

Kyrgyzgidromet made systematic observations of meteorological and hydrological conditions affecting the development of agricultural crops and pasture grasses, trend analysis, forecasting extremely high levels of pollution and warning State bodies and economic subjects. For a long time Kyrgyzgidromet measured concentrations of DDT and products of its decomposition in water and soil by taking water and soil samples from selected test-sites at definite time intervals.

MAWRPI has a CPPQD under which there are two control-toxicological laboratories (hereafter - CTL). The service controls and supervises the safe storage, transportation, and economically and environmentally sound use of plant protection chemicals and mineral fertilizers. CTL measured residual concentrations of DDT and products of its decomposition, aldrin, chlordane and hexachlorbenzene. Seasonal researches were conducted at four test-sites. Currently all work has been suspended due to cuts in funding.

The Kyrgyz Republic Ministry of Health is responsible for organising and keeping the National Register of potentially toxic chemical substances, agrees regulations for the transportation, storage and use of hazardous substances and approves sanitary-hygienic norms of pesticides in the environment and foodstuffs. In the Kyrgyz Republic Ministry of Health toxicological monitoring is done by two organisations: The State Sanitary Epidemiological Control Department (SSECD) and the Profilakticheskaya Meditsina (Preventive medicine) scientific-production association.

The SSECD carries out toxicological control of livestock-breeding and agricultural raw materials, foodstuffs, and controls imported and exported products for which it issues certificates of quality or conformance. Foodstuffs sold in the domestic market are controlled selectively throughout the Republic and concentrations of DDT and products of its decomposition, hexachlorobenzene, aldrin and hexachlorocyclohexane are determined.

Profilakticheskaya Meditsina being a scientific-research association carried out certain types of toxicological research. From 1985 to 1995 in the Suzak rayon of Osh oblast research was done into the DDT and hexachlorobenzene levels in surface and drinking water, soil and the atmosphere. Now the laboratory of Profilakticheskaya Meditsina no longer exists. Analysis of the present system of POPs monitoring revealed the following problems:

- there has been no research into identifying endrine, mirex, toxaphene, PCBs and dioxins/furans;
- weak and ineffective coordination of monitoring and control of POPs by ministries and departments;
- inadequate information sharing among departments involved in management of chemical substances limits the possibility of reaching effective and efficient decisions;
- insufficient consolidation of administrative, financial and community resources.

**Review of the technical infrastructure for identifying POPs.** The Republican and Osh CTL of the CPPQD under the Kyrgyz Republic MAWRPI are responsible for inventorying and controlling prohibited and obsolete pesticides, including POPs-pesticides.

In 2003 laboratory equipment including liquid and gas-liquid chromatographs, low resolution chromatomass spectrometer was purchased for the CTL by a subsidiary agricultural services support Project. The laboratories can currently analyse 28 pesticides used in the republic and products of its decomposition in crops, soil, water and air. They have technical documentation for all pesticides registered in the Republic according to the *Regulations for registration tests and the registration of pesticides* (approved by Order № 62 of MAWRPI dated March 5th 2003) and are accredited for technical competence with the National Institute of Standards and Metrology of the Kyrgyz Republic.

SSECD laboratories and its area sanitary-epidemiological services determine the levels of chloro-organic pesticides a, p, γ-hexachlorocyclohexane, DDT, DDE, DDD in foodstuffs, soil, drinking water and work place air.

The state of the technical infrastructure for POPs evaluation is poor. In general, with the exception of the CPPQD, due to the lack of funds for new equipment, it became outdated and worn out long ago and cannot provide the necessary level of measurements. Laboratories' equipment should be modernised immediately otherwise the possibility of making regular analyses will be irretrievably lost.

There is a regular brain drain of specialists possessing knowledge and skills in this field and no system for increasing professional skills. Training and increasing the qualifications of analytical chemists and, in particular acquiring modern methods of physical-chemical analysis is the most critical problem in providing the chemical security of the Republic. This problem is especially critical in view of monitoring and managing environmental pollution with POPs.

### **3.10. POPs impact upon public health and the environment**

POPs related problems are of principal concern in view of their influence on human health. For decades Kyrgyzstan with its developed agriculture intensively applied a wide range of plant protection chemicals including POPs. From 1970-1994 pesticides later included in the list of POPs - DDT, aldrin, toxaphene, heptachlor and hexachlorocyclohexane (lindane) were intensively used to boost yields of crops such as cotton, tobacco, alfalfa, corn etc. and to protect plants from various diseases in the fields of the Republic

Of special concern is data stating that in some regions where chemicals were extensively used in agriculture, the physical growth and development of children born to mothers who worked with pesticides for a long time was much lower than that of children in the control group. Higher incidences of infant mortality are noted in these regions and children under 14 are more often diagnosed with iron-deficiency anemia, tuberculosis, viral hepatitis and acute respiratory viral infections. One of the probable reasons for the cancer-related diseases is pesticides' impact upon human health. In spite of the fact that intensive use of POPs in Kyrgyzstan almost stopped in the late 1980's the presence of pesticide residues in the environment still represent a danger to public health.

**Agricultural land.** According to Kyrgyzhydromet data, from 1986 to 1992 out of 29.9 thousand hectares of test-sites, the area with DDT levels higher than MAC (0.1 mg/kg) was 7.6 thousand hectares, or 25%. Analysis of available material obtained for the whole period of observations showed that the level of soil pollution with DDT and products of its decomposition in the Kyrgyz Republic is quite high, in spite of the fact that in this period DDT has never been used anywhere (at least according to official data). The most polluted (DDT and products of its decomposition) land in all examined oblasts is where cotton and tobacco are grown and in gardens.

**Water and air.** In the water of open reservoirs the most cases of exceeding the MAC of DDT (0.002 mg/l) was registered in 1993 and the largest quantities of DDT were found in 1993 - 0.1mg/l in underground water in the Suzak rayon of Jalalabat oblast. It should be noted that number of checks on underground water for POPs levels has fallen significantly - in 2004 by 5 - 6 times compared to 1989-1990. Currently, underground spring water quality monitoring does not make it possible to really estimate the level of pollution because of the low number of observations. In drinking water, according to data of sampling analyses in 2004, DDT levels did not exceed MAC levels. Analysis of laboratory data

of workplace air monitoring confirms a fall in the number of samples exceeding DDT MAC from 4.8% in 1989 to isolated samples - in 2004.

**Rivers.** Kyrgyzstan is the only Central Asian country whose water resources are fully formed in its own territory. The Republic is located in a river formation zone and thus, any releases into trans-border rivers lead to irreversible effects, which in their turn can lead to disputes with neighboring countries.

In 2005 selective samples into DN water for DDT and products of its decomposition's content was conducted in the area where the rivers in the Fergana and Talas Valleys are formed and the Issyk-Kul Lake basin. As a rule water from the DN is discharged into rivers and reservoirs and thus, can be a potential source of pollution. DDT and products of its decomposition were found in all the examined samples in quantities from trace amounts to many times MAC. Thus, rivers are a source of trans-border transfer of POPs-pesticides.

**Son-Kul Lake.** In the 1970's the land around Son-Kul high-mountain lake (3, 020 m) was used as pastures for livestock. In 1979 there was a plague of locusts there and pesticides including DDT and hexachlorocyclohexane were used for pest control. Later the pesticides were washed away by rain and snow into the small rivers that flow into the lake, leading to the mass death of fish and severely damaging the bio-diversity of the lake. Laboratory findings of the water, shoreline and bottom sediments of the lake showed that POPs-pesticides are concentrated in spotty pattern along the southern part of the shore. Pollution of its coastal waters with DDT and products of its decomposition can be seen along the southwestern (0.55 - 5.92 ug /l), southeastern shorelines (0 - 1.16 mg/l) and near the shore (0 - 0.44 ug/l) at Kaiyrty river head. DDT and products of its decomposition are concentrated in the coastal soil and bottom sediments in spotty pattern too. Maximum levels of pollution are found on the lakebed 1 m from the shore - 0.92 - 35.91

**Glaciers and glacial lakes,** located 2, 500-4, 000 m above sea level in Kyrgyzstan are sources of fresh water not only for the Republic but also for the Central Asian countries. A moraine lake whose water and soil samples were examined for pollution with POPs-pesticides is located near the Adygene Glacier in the Ala-Archa River basin on the north side of the Kyrgyz Ala-Too mountain ridge. It is very remote from agricultural land and pesticide stockpiles, which excludes the direct effect of economic activity upon the environment. Research into the glacial lake water showed DDT and products of its decomposition in concentrations of 0.9 - 0.47 fig/l.

In 1981 DDT and products of its decomposition were found in soil in the Sary-Chelek biosphere reserve (DDT 0.001 - 0.01 mg/kg, DDD - 0.002 - 0.025 mg/kg, DDE - 0.002 - 0.034 mg/kg), where this preparation has not been used.

**Foodstuffs.** In general, analysis of laboratory data indicates that the levels of pollution with POPs-pesticides in food raw materials and foodstuffs had fallen from 2.6% in 1989 to 0.4% in 2004 and that in recent years DDT and hexachlorocyclohexane have not been found in tested samples of fish, bakery and children's dairy products and canned goods. Alongside this, levels of DDT and hexachlorocyclohexane in vegetable oil, meat, dairy products and eggs still exceed the norms by 1.5-2 times and in Issyk-Kul oblast in 2003 more than 3% of analyzed samples of dairy and meat products were contaminated with DDT.

The area in the Republic where the content of DDT in foodstuffs has been most thoroughly studied is Osh oblast as it is the area where DDT, hexachlorocyclohexane, aldrin and heptachlor were most intensively used and has the highest rate of detection of these chemicals. Targeted research carried out in 2004 for POPs-pesticides' content in foodstuffs showed that traces were found in 18.8 % of dairy products, vegetable oil, 21.4 % and meat products, 10.0 %. High concentrations of POPs-pesticides were found in the main vegetables. Hexachlorocyclohexane was found in: carrots, 60%, potatoes, 52.0% and onions, 39.1% and DDT and products of its decomposition 69.9%, 24% and 34.8% respectively. POPs-pesticides were found in 8.6% of the drinking water and open reservoir samples.

It is important to note that POPs-pesticides are found in foodstuffs throughout the Republic.

**Concentrations in the human body. Breast milk.** In 2004 the Ministry of Health conducted research into levels of DDT and other POPs-pesticides in human breast milk (33 samples). Of special concern was that the number of samples of breast milk containing DDT in the South of the Republic from 2002 - 2004 was almost double those in 1985. A comparative analysis of various public health indicators that can be

linked to the impact of POPs was conducted in Osh oblast. In the breast milk of women living in Osh oblast DDT, DDE, DDD and HCCH were found in 35% of samples in 1992 and in 56.4 % of samples in 2001. This could be linked to the fact that since 1995 cotton and tobacco growing has rapidly fallen in suburban areas of Osh and the population has started growing vegetables and fruit on the land.

The concentration of DDT, DDE, DDD and HCCH in breast milk in summer time is up to ten times higher and moreover these pesticides are combined. The highest rate of pesticide detection in the breast milk of urban women is in summer time from May - June (100%), when people eat lots of vegetables and fruit grown mainly in cotton- and tobacco-growing regions of Osh oblast. In the breast milk of women from cotton-growing areas the simultaneous presence of two or more pesticides can be observed. The highest content of DDT and its metabolites, HCCH was noticed in breast milk of women from cotton- and tobacco-growing regions in the period from early June to October and the lowest - in women involved in growing leguminous plants and livestock-breeding.

DDT, DDE, DDD and HCCH were found in the placenta and amniotic fluid of 39% of pregnant women examined. In the majority of cases they had complications during pregnancy and at delivery: urban, in 63.8% of cases, among women from cotton-growing areas, 59.3% and from tobacco-growing areas, 40.3%. The highest frequency of detecting DDT, DDE, DDD and HCCH was in the placenta of women from cotton-growing regions (44%), the lowest - in women from tobacco-growing areas (24.6%).

The incidence of breast cancer from 1998-2003 in Osh oblast as compared to 1992-1997 has increased by 1.75 cases per 100 thousand people and in Osh - by 2.27. The most noticeable growth was in cotton-growing areas - from 1.02 to 3.76 and in tobacco-growing areas - from 0.79 to 3.75.

The incidence of ovarian cancer in Osh oblast from 1992 to 2003 increased among women in cotton- and tobacco-growing areas and fell in "clean" areas. An indirect indicator of the impact of POPs-pesticides as risk factors in the above hormone-dependent tumors is their higher level in malignant tissues of the lactiferous gland, ovary, neck of the uterus and womb body, removed during operations. Research showed that DDT, DDE, DDD and HCCH were found in 100 % of women from cotton-growing areas, in 84% of urban women and in 88% of women from tobacco-growing areas.

Problems of the impact of POPs on human health and the environment are aggravated by the absence of a reliable system of medical-ecological control and monitoring of the use of pesticides on farms and in imported agricultural products. At the same time due to lack of funds, sanitary and epidemiological research has been done patchily and not in full, which does not enable exact levels of the impact of individual POPs on human health to be determined.

### **3.11. Economic assessment of the damage from POPs**

In its 15 years of independence Kyrgyzstan has carried out radical reforms aimed at establishing a democratic state, preserving and developing common human values and economic and social development. In the course of the radical reforms after the collapse of the command-administrative system society had to face serious problems, including economic crises, falling living standards, increased poverty, growing burden of external debt etc. In the sphere of environmental protection two tendencies have emerged distinctly from the economic activity.

One of them caused by the recession in industrial and agricultural output has been a lower environmental load. Another one also connected with economic crises has been the current destructive attitude towards fragile natural ecosystems (land, water resources, atmosphere, forests). Environmental standards have also been neglected and less has been spent on environmental protection. The impacts of POPs use are: risk to human health and economic damage to the environment from pesticides containing POPs, use of PCB-contaminated equipment and from the unintentional production of dioxins and furans. Compensation for or prevention of such damage results in additional expenses. Damage to the health and life of people leads to increased expenses in terms of healthcare. It is also necessary to take into consideration expenses connected with executing reinstatement works to eliminate the negative impact upon the environment of economic activity.

In the Republic there are no adapted methods for assessing the economic damage caused to the environment as the result of releases of pollutants from using and storing POPs. Economic damage is calculated according to the *Instructive-methodological directions for defining payment for environmental*

*pollution in the Kyrgyz Republic*, approved by Resolution № 823 of the Kyrgyz Republic Government dated November 10th 2004. According to these directions payment for environmental pollution is collected from natural resource consumers having the following types of impact upon the environment: releasing pollutants from stationary and mobile sources into the atmosphere; discharging pollutants into surface and underground water resources; dumping wastes in the environment, which is why the calculated amount of damage caused to the environment from using and storing POPs has to be considered as approximate. However, approximate economic damage from pollution of atmospheric air by releases of dioxins from burning medical wastes was calculated in 2001 at about 80 mln som and for polluted reservoirs - about 300 thousand som. There is no information on individual reservoirs.

Damage to the quality of soil and land through anthropogenic factors is primarily expressed as pollution of land with chemicals, using unauthorized dumps and other types of wastes disposal. The economic damage of taking land for warehouses, airports, burial pits and burial grounds from 1983 - 2003 was 20 mln som; damage to agricultural land with DDT residues was 2.8 bin som.

Damage caused to health by just two hormone-related diseases - breast cancer and ovarian cancer - is annually estimated at 2 - 3.4 mln som and from 1992-2003 was 35 mln som.

### **3.12. Social assessment and activities of non-governmental organizations**

In the course of preparing the NIP NGOs carried out social research into public awareness of POPs problems and as a result obtained data about the level of public awareness of POPs, of sources of information and opinions about the problem. Reasons for insufficient awareness of the public and representatives of groups whose activities are connected with POPs are lack of information in the main mass media channels (television, radio, newspapers) and weak explanatory work by local authorities, ministries and departments of the Republic.

Within the frameworks of preparing the NIP a website of the project was designed [www.pops.kg](http://www.pops.kg) where information about the project, results of the POPs inventory, an information storage and retrieval system about wastes and stockpiles of POPs in the Republic can be found.

On the initiative of NGOs and in close cooperation with interested ministries and departments, the Concept of continuous ecological education in the Kyrgyz Republic was developed. In the process of implementing GEF/ UNEP Project № GEL-2328-2761-4714 Kyrgyzstan: Enabling Activities for the Development of a National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (POPs), teaching-study textbooks for pupils and students were prepared.

## **4. Strategy**

### **4.1. Policy statement**

Fully sharing the worries linked to the application of hazardous chemical substances, including POPs, possessing toxicity and resistant to decomposition, their potential to be transported a long way in the environment, their accumulation in food chains and, finally, in the human body, the Kyrgyz Republic totally supports the actions of the world community regarding this group of hazardous chemical substances.

The purpose of the environmental policy of the Kyrgyz Republic regarding the control and use of hazardous chemical substances including POPs, is to protect the health of current and future generations and the environment from adverse effects.

Implementation of the NIP will give a powerful boost to the execution of the following tasks:

- creating, first of all, a unified system of control and management of hazardous chemical substances;
- improving the environmental legislation of the Kyrgyz Republic and ecological standards and norms taking into account international experience;
- will allow mechanisms of interdepartmental interaction, mutual responsibility and coordination of activities aimed at protecting public health and the environment to be tested.

To achieve these goals the Kyrgyz Republic is obliged to allocate, where possible, the necessary

financial, technical and human resources. However, taking into account the difficult state of its transition economy the Republic desperately needs, first of all, financial and technical support for the NIP. The NIP is adapted to the economic and social realities of the Kyrgyz Republic and is integrated into its overall strategy of sustainable development and its implementation will not only improve public health and create an ecologically clean environment, but also raise living standards.

#### **4.2. National strategy**

The National Strategy for the environmentally sound management of chemical substances, including that of reducing and eliminating POPs is an integral part of state political, economic and social country development programmes. Implementation of the plan of liabilities under the Stockholm Convention is considered part of the work fulfilled in Kyrgyzstan under previously adopted international conventions and agreements, in particular the Basel and Rotterdam Conventions.

Policy of the state in managing chemical substances is aimed at executing top-priority actions with a common goal - limiting and eliminating the danger from chemical substances, including POPs, to human health and the environment.

To solve the environmental problems of limiting and eliminating POPs it is necessary to update and improve the legislative base by introducing legislation meeting the requirements of the Stockholm Convention. It is necessary to develop regulations, procedures, standards and guidelines clearly defining the competences and duties of entities involved in solving the problems of human health and environmental protection. It is also proposed to amend and introduce new ecological standards for hazardous chemicals and their packaging requirements, transportation, storage etc.

The task of the State Agency for Environmental Protection and Forestry under the Kyrgyz Republic Government, as the main coordinating body, is creating an effective system of interaction between various ministries and departments to implement the NIP.

Actions under the NIP require institutional measures, such as task sharing and authorities among state bodies, local self-governance bodies and economic entities. It is also stipulates creating a normative base regulating POPs handling. It is proposed to create a National Coordination Committee to fulfill the liabilities under the Stockholm Convention and provide information sharing between the Parties and the Convention Secretariat. It is planned to create a permanent Chemical Safety Centre responsible for the practical implementation of the Republic's liabilities under the Stockholm, Basel and Rotterdam conventions, keeping a list of pollutant release and transfer registers (PRTR) under the Aarhus Convention.

Reducing or eliminating releases during intentional production and use entails making a full-scale inventory of PCB-contaminated equipment and materials, providing for their centralized interim storage until their final destruction; systematic replacement with alternative materials and substances and planned withdrawal of PCB-containing equipment. At intermediate stages it is planned to train personnel and responsible persons in identifying, marking and safe handling of PCB-contaminated equipment and materials.

Measures for reducing releases, as a result of unintentional production entail detailed research into the largest dioxin generating sources.

POP-pesticides stockpiles and wastes are mainly of DDT and are concentrated in warehouses and burial pits, for which safe storage is provided. It is necessary to carry out additional research to reveal pesticide stockpiles and wastes in former warehouse areas and mixture preparation sites. It is planned to carry out an inventory and collect stockpiles of POPs-pesticides on private farms throughout the Republic.

With the aim of reducing releases from stockpiles and wastes, POPs warehouses must be repaired, pesticide burial pits destroyed, and prohibited and shelf-life expired pesticides and PCB-contaminated equipment and materials must be collected, re-packed, transported and stored in a central interim store. Ruined and half-ruined buildings of unused pesticide warehouses and mixture preparation sites on airfields need to be preserved using environmentally sound methods.

Revealing polluted areas entails additional research into agricultural land treated with POP-pesticides and finding polluted sites in areas where pesticides were stored, mixed for agricultural aviation, burial pits of

prohibited and shelf-life expired pesticides and PCB-contaminated equipment and materials were used and stored. It is necessary to carry out research to reveal sites polluted by sources of unintentional releases. It is proposed to map polluted sites.

Information sharing about POPs problems is given great importance beginning with improving the system of collecting and processing statistical information. The National Coordination Committee will be responsible for information exchange between the Parties and the Secretariat of the Stockholm Convention on POPs. The Committee will execute interdepartmental coordination between state bodies, local self-governance bodies, economic entities, NGOs and others.

Public awareness will be achieved through widespread propaganda about the problem of reducing and eliminating POPs by means of the mass media and textbooks for schoolchildren and students. It is planned to conduct a series of training seminars for employees of supervisory bodies and personnel directly involved in handling POPs.

It is proposed that the National Coordination Committee provides the Parties and the Secretariat of the Convention with regular information and reports on the implementation of the NIP and of problems of POPs at national level. The NIP includes cooperation with Central Asian countries on issues of the Convention. Reporting will be based on comparable data defined by the Convention Secretariat that will be the basis for the system of monitoring and evaluating the effectiveness of the NIP implementation in Kyrgyzstan.

The **NIP** includes tasks for strengthening the scientific and professional potential of the country, applying best available techniques and best environmental practices training specialists, adapting the most effective and environmentally sound methods of eliminating POPs, creating a centralized information system and monitoring and evaluation of the **NIP** implementation

The most critical issues are those connected with financing activities under the **NIP**. Along with providing a guaranteed allocation of budget funds it is necessary to seek new sources of funding. Due to the acute budget deficit it is important to actively attract investments and defining subjects for donor aid for the technical, information, scientific and professional improvement of national potential.

The National Strategy for the environmentally sound management of chemicals, including POPs elimination, was developed according to the requirements of the Stockholm Convention.

**Its main tasks are:**

**Reduction of releases from intentional production and use (Article 3, Annexes A, B):**

- systematic phase out of use of PCB-contaminated equipment (with a volume of more than 5 litres and a concentration of > 10% ; more than 5 litres, >0.05%; more than 0.05 l and >0.005) by 2025;
- prohibit direct reuse of PCB-contaminated substances (in concentrations > 0.005%);
- identify and provide environmentally sound handling with other PCB- contaminated goods (> 0.005%);
- support for measures reducing the effects and risks connected with the use of PCB-contaminated equipment;
- evaluate currently used and prevent the production of new pesticides and industrial substances that can be defined as POPs.

**Reduction or elimination of unintentionally produced releases (Article 5):**

- In two years develop an action plan for reducing or eliminating unintentionally produced releases;
- support the use of measures for reducing releases and/or eliminating their sources;
- support the use of substitute or modified materials in processes leading to unintentional releases;
- support the use of best available techniques and best environmental practices

**Reduction or elimination of releases connected with stockpiles and wastes (Article 6):**

- develop and use practices to identify stocks and products, goods and wastes containing POPs;
- provide effective and environmentally sound handling of stockpiles (pesticides, PCBs) and POPs wastes;
- prohibit direct reuse or alternative options of use of POPs or their wastes;
- transport hazardous wastes according to international rules, standards and guidelines;

- develop methods for revealing sites polluted with POPs and reinstate the sites using environmentally sound methods.

**Listing chemicals in Annexes (Article 8):**

- prepare proposals for substances that can be defined as POPs, to be included in the Stockholm Convention.

**Information exchange between the Parties to the Convention (Article 9):**

- create a proper information sharing mechanism between the Parties of the Stockholm Convention on POPs;
- appoint/create a National Coordination Centre for exchanging information with the Secretariat of the Stockholm Convention on POPs.

**Public information, awareness and education (Article 10):**

- provide access to and information about POPs to the public; develop educational programmes, especially for women, children and the least educated about POPs related problems;
- define mechanisms for public participation in solving issues regarding POPs, their impact upon the environment, human health and developing of adequate responses ;
- train workers, scientists, educators, technical and managerial personnel
- encourage industry and professional users to promote and facilitate the provision of information
- develop mechanisms of information dissemination (press, radio, television, reports, data on safety, create an information centre/centres);
- create pollutant release and transfer registers

**Scientific research, developments and monitoring of POPs and substances similar to POPs (Article 11):**

- study and control releases and sources of releases into the environment;
- study levels, presence and trends of change in the human body and the environment;
- study the transfer, "fate" and transformations in the environment;
- study the effect on human health and socio-economic and cultural impacts;
- control the reduction/elimination of releases/sources of releases;
- harmonize ways of making inventories of generating sources and analytical techniques for measuring releases

**Reporting to the Conference of the Parties (Article 15):**

- provide statistical data on volumes of POPs production, import and export.

## **5. Action Plan**

The NIP is a system of integrated measures aimed at protecting human health and the environment according to the Stockholm Convention. The NIP proposes basic actions to minimize and eliminate 12 of the most dangerous POPs and new chemicals, which will be included in the list of POPs.

### **5.1. National Priority Setting**

Setting the priorities of the NIP is an important methodological procedure, which is intended primarily, to identify priority activities. This procedure is executed using Target Oriented Programme Planning methodology in view of the results of the inventory and requirements of the Stockholm Convention.

Priorities of the NIP are those tasks, which fulfillment will promote attaining the NIP objective. Protection of human health and the environment is real on a global, sub-regional and national scale and will contribute to economic and social development.

The group of experts prepared a prioritised list of tasks based on a set of criteria grouped by utility, possibility and importance, which was discussed and agreed with all stakeholders. Public opinion and awareness on POPs was revealed based on questioning and case studies and the results obtained were taken into account when finally defining the most important tasks of the NIP.

**Thus, for the Kyrgyz Republic the most important actions are:**

- > **management of stockpiles (pesticides, PCBs) and wastes (POP)s in an environmentally safe**

**manner. This includes:**

- making an additional inventory, repacking, collecting and transporting **POPs-pesticides** from revealed stockpiles to interim warehouses and storing them till their final destruction; eliminate burial grounds of pesticides in the Kochkor and Suzak regions.
  - carry out a detailed inventory of **PCB-contaminated** equipment - transformers, capacitors, oils; develop a database; label all equipment; set up areas for holding, collecting and transporting PCB-materials; controlling the repair and oil changes of PCB- contaminated equipment; designing a plan for destroying PCB- contaminated equipment and oils;
  - assessing **unintentional releases** and their impact on the environment in the two largest cities of the country (Bishkek and Osh); preparing a feasibility report (FR) on recycling medical wastes; develop a national strategy on reducing releases as a result of burning fuel, domestic wastes and polluted plant residues of cotton and tobacco to heat houses in the countryside; developing an action plan to reduce or eliminate sources of unintentional POPs releases; promote BAT and BET;
  - making additions and amendments to the legislation concerning **POPs management** in accordance with international standards; develop a full package of directive and normative documents;
  - develop a POPs database; organise a monitoring and evaluation system; develop appropriate methods and improve the technical capabilities of laboratories; establish regional cooperation on POPs problems in Central Asia;
- > **develop appropriate strategies for identifying POPs-contaminated sites and on-site remedial measures in an environmentally safe manner**, namely:
- assess the current situation on POPs-contaminated sites showing the degree of pollution and hazard assessment;
  - propose BAT and BET on minimizing/eliminating sources of unintentional releases;
  - develop guidelines for on site remedial work;
- > **public information, awareness and education** in particular:
- involve the mass media in popularizing POPs problems;
  - prepare educational material and manuals for secondary schools and higher educational institutions;
  - widespread participation of the public in deciding POPs problems;
- > **scientific research, developments and monitoring of POPs and similar chemicals**, particularly:
- active participation in international POPs programmes;
  - solving problems of trans-border movements of pollutants (glaciers, rivers, lakes) through regional cooperation with China, Kazakhstan, Tajikistan and Uzbekistan; hazard assessment and elaboration of united actions;
  - developing technologies for reducing and eliminating POPs releases;
  - designing medications to remove POPs from the human body;
- > **establish an inter-departmental coordinating committee on implementation of the Stockholm Convention's requirements and appoint its working body.**

## **5.2. Proposed Actions**

Actions included in the NIP are shown in the table below

Problem Area	Objectives	Proposed Actions	Responsible Agencies	Duration	Status	Cost Range, US\$	Potential Sources of Financing
<b>Legal and Institutional Activities</b>							
<b>International legal norms and standards</b>	Bring the POPs national legal base into conformity with the Stockholm Convention requirements.	Revise existing legal acts; adopt appropriate amendments.	GKR, SAPEF, MITT, MAWRPI, MH, MES.	2007-2009		75-100	
<b>Sub-legislative and directive-normative legal acts</b>	Transfer the amended POPs legal provisions into practical tools.	Develop a package of Government normative-legal acts for transferring the amended POPs legal provisions into practical tools.	GKR, SAPEF, MITT, MAWRPI, MH, MSP and L, MES.	2007-2009		20-25	
		Draft and introduce POPs regulatory documents. Develop regulatory mechanisms and draft guidelines to support the POPs normative-legal acts.	SAPEF, MITT, MAWRPI, MOH, MSP and L, MES.	2007-2009		50-75	
<b>Administrative set-up</b>	Establish a national system of POPs and other toxic substances safety management	Draft guidelines on responsibility sharing between state and city administrations and stakeholders on POPs management.	GKR, SAPEF, MITT, MAWRPI, MH, MSP and L, MES and others	2007-2008		50-75	
		Create a National Coordination Committee to implement the Stockholm Convention requirements. Develop and establish an information exchange system between the Parties and the Stockholm Convention Secretariat.	GKR, SAPEF	2007		50-75	
		Create a permanent Chemical Safety Centre to manage implementation of KR international obligations under the Basel, Stockholm, Rotterdam Conventions and a Protocol on PRTR under the Aarhus Convention, stakeholders consultations.	SAPEF	2008-2009		100-125	
					<b>TOTAL</b>	345-475	

Problem Area	Objectives	Proposed Actions	Responsible Agencies	Duration	Status	Cost Range, US\$	Potential Sources of Financing
<b>National Capacity Building</b>							
<b>Monitoring and evaluation</b>	Increase capacity for controlling POPs' impact on human health and the environment.	Improve the technical capacities of existing departmental laboratories.	SAPEF, MITT, MAWRPI, MH, MSP and L, MES	2008-2010		800-1000	
		Consult the Central Asian countries about setting up a regional laboratory providing analyses of POPs-pesticides, PCBs and dioxins. Set up the laboratory and start work.	SAPEF, MITT, MAWRPI, MH, MSP and L, MES	2008-2010		1500-2000	
	Improve data management and reporting in the field of POPs-containing chemicals.	Procure hardware and software, train staff, create an information system and database, set-up POPs and other toxic substances statistical and reporting procedures.	SAPEF, MES, MH, MITT, MAWRPI, MTC	2008-2009		50-75	
	Assess the impact of POPs and other toxic substances on human health and the environment.	Develop a risk assessment methodology.	SAPEF, MES, MITT, MH, MAWRPI, MSP and L	2007-2010		20-25	
<b>Detailed POPs inventory</b>	Develop a strategy for identification of POPs stockpiles and POPs-contaminated products and wastes.	Develop guidelines on identifying POPs-contaminated sites (POPs-pesticides, PCB, dioxins). Consultations with stakeholders and international experts.	SAPEF, MES	2008-2009		20-25	
		Test in practice, update and revise the handbook on identifying contaminated sites in a selected (pilot) area.	SAPEF, MES	2009-2010		15-20	
		Develop methodological guidelines for identifying products and wastes contaminated with POPs, POP-pesticides, PCBs and dioxins. Consultations with stakeholders and international experts.	SAPEF, MES, MH, MAWRPI, MSP and L	2008-2009		20-25	

<b>Eliminating and reinstating stockpile sites</b>	Upgrade the capacity of local authorities and staff in preparing, eliminating and reinstating stockpile sites.	Detailed inventory of sources of unintentional releases of dioxins/ furans.	SAPEF, MES, MH, MAWRPI, MITT	2008-2010			
		Draw up a Pollutant Release and Transfer Register.	SAPEF, MES, MH, MAWRPI, MITT	2007-2008		15-20	
		Identify existing and new pesticides and industrial chemicals that can be defined as POPs.	SAPEF, MES, MH, MAWRPI, MITT	2007-2011		50-75	
		Staff training on the environmentally safe management of pesticide stockpiles. Design training curricula, specifications and purchasing of equipment, training courses for 40 district authorities (updated after 2 years).	SAPEF, MAWRPI, LSA	2007-2008		100-125	
		Staff training on the safe and environmentally sound repackaging and transportation of pesticides at district level. Design training curricula for specialists of 40 districts, consultations with stakeholders and local authorities.	SAPEF, MAWRPI, LSA	2007-2008		100-125	
	POP-pesticides elimination.	Implement a feasibility study into collecting, repackaging, transporting, and centralized storage of prohibited/obsolete pesticide stockpiles.	SAPEF, MES, MH, MAWRPI, MITT, MTC	2008-2009		20-30	
		Implement a feasibility study into destroying the wastes burial pit and on-site remedial work in the <u>Kochkor</u> region	SAPEF, MES, MH, MAWRPI, MITT, MTC	2008-2009		10-15	
		Implement a feasibility study into destroying the wastes burial pit and on-site remedial work in the <u>Suzak</u> region.	SAPEF, MES, MH, MAWRPI, MITT, MTC	2008-2009		10-15	
	Withdrawal of PCB-contaminated equipment.	Prepare a step-by-step withdrawal plan of PCB-contaminated equipment. Label PCB-contaminated electro-technical equipment. Consultations with owners of PCB-contaminated equipment.	GKR, SAPEF, MES, MITT	2008-2010		20-25	

	Destroying PCB-contaminated equipment and materials.	Train producers' staff in identifying PCB-contaminated equipment and safety management of PCB-contaminated materials. Draw up a training manual and training courses for identifying and labeling PCB-contaminated equipment. Consultations with owners of PCB-contaminated equipment.	SAPEF, MES, MITT	2008-2009		150-200	
		Feasibility study into creating two regional centres for interim storage of PCB-contaminated equipment and oils.	SAPEF, MES, MITT	2007-2008		20-25	
		Prepare a plan for eliminating PCB-contaminated equipment and materials.	GKR, SAPEF, MES, MITT	2008-2009		30-40	
Regional cooperation in identifying technologies for destroying POPs-stockpiles.	Cooperation with Central Asian countries in identifying technologies for eliminating POPs-stockpiles. Select a site for building a plant to destroy POPs-stockpiles.	GKR, SAPEF, MES, MITT	2008-2012		150-175		
On-site remedial work and monitoring	Prepare remedial work and a monitoring plan for contaminated sites. Propose biological methods for reinstating contaminated sites.	SAPEF, MES, MOH, MAWRPI, MITT	2010-2012		20-25		
Reducing unintentional industrial releases.	Develop an action plan for reducing the largest sources of unintentional releases of dioxins and furan using BAT and BET.	SAPEF, MES, MH, MITT, MSP and L	2008-2012		40-50		
	Feasibility study into destroying domestic and medical wastes.	SAPEF, MES, MH, MAWRPI, MITT	2008-2009				
	Design a strategy to minimize unintentional releases as a result of burning fuel, domestic wastes and polluted plant residues of cotton and tobacco for heating houses in rural areas.	SAPEF, MES, MH, MAWRPI, MITT, MSP and L	2008-2012				
<b>Destruction of POPs stockpiles and POPs-</b>	Final destruction of POPs-	Select technologies for destroying POPs-pesticides.	MES, MITTJLG	2010		50-75	
		Select technologies for PCB-contaminated oils and capacitors destruction.	MES, MITT, NEN	2020		10-15	
				<b>TOTAL</b>		2935-4380	

Problem Area	Objectives	Proposed Actions	Responsible Agencies	Duration	Status	Cost Range, US\$	Potential Sources of Financing
<b>Remedy</b>							
<b>Storing POPs and POPs-contaminated materials in a safe manner until destruction</b>	Provide for holding POPs in a safe and environmentally sound manner until destruction.	Destroy wastes burial pits and on-site remedial work in Kochkor area.	MES, MAWRPI, SAPEF, TLG	2010-2012		50-60	
		Destroy wastes burial pits and on-site remedial work in Suzak area.	MES, MAWRPI, SAPEF, ILG	2010-2012		70-80	
		Prepare centralized stores for collected obsolete and prohibited pesticides.	MES, MAWRPI, SAPEF, ILG	2008-2010		75-100	
		Prepare sites for storing PCB-contaminated equipment and oils.	MES, MITT, SAPEF, ILG	2008-2010		60-70	
		Fence off sites of abandoned and unused storehouses and airstrips and mark with safety/warning signs.	MES, MAWRPI, SAPEF, ILG	2008-2010		150-175	
	Repackaging and centralized storing of POPs.	Purchase environmentally safe repackaging materials and protective clothing. Repackaging and transporting to centralized interim stores.	MES, MAWRPI, SAPEF, ILG	2008-2010		250-300	
		Make an inventory of and collect obsolete and prohibited pesticides stored in private households and transporting them to centralized interim stores.		2007-2009		150-175	
		Collect and transport PCB-contaminated equipment, oils and soil to the stores.		2010-2025			
<b>Reduction and elimination of unintentional releases' sources</b>	Introduce BAT and BET for the largest sources of unintentional releases			2010-2012			
<b>Remedial work on contaminated soil</b>	Implement measures to reduce the impact of POPs-contaminated soils on human health and the local environment.		MAWRPI, ILG	From 2009 till 2020		350-400	
				<b>TOTAL</b>		1155-1460	

Problem Area	Objectives	Proposed Actions	Responsible Agencies	Duration	Status	Cost Range, US\$	Potential Sources of Financing
<b>Public awareness, training, education and research</b>							
<b>Public awareness and education</b>	Improve public awareness and education.	Develop educational curricula, organise training seminars, develop and disseminate related information in the mass media and accessible publications. Develop and introduce training packages. Involve NGOs in all stages of the work. Public access to POPs-related information.	MES, SAPEF, MAWRPI, MOH, MITT, MES and YP	2008 - 2025		150-200	
	Public hygiene education on POPs problems.	Develop educational packages, organise training seminars, POPs-related publications, manuals etc.	MES, SAPEF, MOH, MAWRPI, MITT, MESYP	2008-2025		120-150	
<b>Training the decision-makers</b>	Upgrade the capacity of local authorities in the environmentally safe management of POPs stockpiles .	Develop educational packages and organise seminars on POPs issues for representatives of local state authorities and self-governance bodies.	SAPEF, LSA, MAWRPI	2007-2025		100-125	
	Upgrade the capacity of the Customs authorities on the movements of hazardous wastes	Develop educational packages and organise training seminars on the movements of hazardous wastes for representatives of the Customs authorities.	MES, SAPEF, MITT,, MTC	2008-2012		150-200	
<b>Promote research and development</b>	Research, development , monitoring of POPs and similar chemicals.	Promote research into POPs-content in the human body and the environment - glaciers, lakes, transboundary rivers.	NAS, SAPEF, MOH, MAWRPI, MITT	2008-2025		50-75	
		Assess the impact of POPs on human health and the socio-economic consequences of living in POP-contaminated areas. Identify the most vulnerable groups of the population. Develop medications to remove	NAS, SAPEF, MOH, MAWRPI, MITT	2008-2025		125-150	
		Identify ways of reducing POPs-pesticide residues in agricultural produce (land treatment, selection of crops)	NAS, SAPEF, MOH, MAWRPI	2010-2025		50-75	

		Prepare guidelines on the biological destruction of POPs-pesticides in soil.	NAS, SAPEF, MAWRPT	2008-2010		50-75	
		Prepare guidelines on the biological destruction of POPs-pesticides in soil	NAS, SAPEF, MAWRPI	2008-2010		50-75	
		Identify and map sites contaminated by POPs-pesticides.	NAS, SAPEF, MAWRPI	2008-2010		50-75	
	Additional POP-pesticide content assessment on previously identified sites, airstrips and deposits.	Research into and monitoring of contaminated sites.	NAS, SAPEF, MAWRPI	2008-2025		150-200	
	Study the largest sources of unintentional POPs releases.	Closely inspect the largest sources of unintentional POPs releases, identified in the preliminary inventory	SAPEF, MES, MH, MAWRPI, MITT, MES and YP	2008-2012		300-400	
		Assess the impact of unintentional releases in the two largest cities in the country (Bishkek and Osh).		2008-2012			
		Develop technologies to reduce/eliminate releases.					
				<b>TOTAL</b>		1295-1725	
				<b>SUM TOTAL</b>		5730-8040	

## 6. NIP Implementation and Updating

The NIP has been developed through an extensive stakeholders consultation process. Its implementation presupposes interaction between state chemical management agencies close cooperation with the private sector, the public and NGOs. It is significant that NIP activities are obligatory for ministries and departments and NIP tasks must be fulfilled.

The NIP is based on the principle of stage-by-stage, systematic implementation. It identifies priority directions in the national environmental programme. The NIP is not the final document for deciding tasks and implementation of individual short-term actions presupposes subsequent updating of the Action Plan. Alongside short-term tasks the NIP includes long-term and permanent tasks. The long-term tasks include implementing actions concerning PCB, POPs monitoring, mapping POPs-contaminated areas, the impact on the health of people living in POPs-contaminated areas and reducing POPs-concentrations in soil.

The overall coordination and control of the NIP implementation will be the responsibility of the State Agency for Protecting the Environment and Forestry under the Government of the Kyrgyz Republic. The NIP will be implemented through close inter-ministerial and inter-sectoral cooperation in the field of chemical management.

NIP actions are very costly and require clearly defined financial sources, volumes of financing and technical assistance. The problem is especially acute in the following areas:

- monitoring the impact of POPs on human health and the environment;
- eliminating obsolete pesticides and PCB-contaminated equipment;
- training personnel in POPs elimination;
- reinstating contaminated sites;
- improving the national legal framework;
- introducing alternatives and reducing PCB in the electricity sector.

For implementing the NIP an assessment procedure using a system of quantitative and qualitative indicators is presupposed. Such indicators could be:

- number of stores meeting sanitary requirements;
- number of reinstating pesticide burial pits;
- quantity of inventoried and labeled PCB-contaminated equipment;
- dimensions of contaminated and reinstated sites;
- number of sources of unintentional POPs releases;
- existence of an NIP information system;
- number of POPs-related normative acts accepted and revised to improve the legal framework;
- number of trained specialists;
- number of NGOs participating in implementing the NIP.

To assure openness representatives of investing organizations, ecological NGOs and scientific institutions will be involved in the evaluation process. This work will be carried out with the participation of the mass media to raise public awareness and increase the activity of the population in deciding environmental problems.

The NIP is not a rigid document and will be subject to revisions and updating to preserve the main principles of the Stockholm Convention during implementation.