NATIONAL IMPLEMENTATION PLAN
ON REALIZATION
OF STOCKHOLM CONVENTION
ON PERSISTENT ORGANIC POLLUTANTS
IN THE REPUBLIC OF TAJIKISTAN

DUSHANBE, 2007

CONTENTS

I. National Implementation Plan (NIP) on realization of Stockholm Convention on persistent organic pollutants in the Republic of Tajikistan

RESUME

The main issues of NIP

NIP was elaborated on the base of Statement of Government of the Republic of Tajikistan No. 17-p from 3rd March 2003 "About approval of the Working Group on elaboration of Action Plan on reduction of use persistent organic pollutants in the Republic of Tajikistan" and the Memorandum, signed by UNEP and Ministry of Nature Protection of the Republic of Tajikistan on 4th September 2003 on elaboration of Project "Enabling Activities for the Development of a National Plan for Implementation of the Stockholm Convention on POPs in Tajikistan" by financial support of GEF.

Purposes of NIP are: reduction of POPs effects on human health and environment, and also elimination of POPs-containing wastes in the Republic of Tajikistan (RT).

NIP is the operative document, reflecting the structure of implementation of Stockholm Convention in RT. NIP is the first step, directed to implementation of POPs priorities in RT.

NIP was elaborated in accordance with results of initial inventory of POPs-related chemical substances, conducted in 2004-2005:

- obsolete and forbidden pesticides, including POPs-containing ones; storage facilities of pesticides;
- electro-technical PCB-containing equipment;
- emissions of unintentionally produced POPs – dioxins and furans;
- POPs contaminated territories: agricultural air-fields, pesticides burial places.

In the NIP on Stockholm Convention of POPs Tajikistan are presented the POPs problems and the ways of their solution till the year 2028. Certain kinds of NIP activities are rather expensive. In this connection, the appropriate technical and financial support of National and International institutions is one the main conditions of successful NIP realization.

Commitments of the Republic of Tajikistan on NIP implementation:

- establishment of National Center on implementation of Stockholm Convention for inter-agency coordination of activities of all involved and interested parties;
- giving authorities to the group of POPs experts on assessment of projects and environmental measures in accordance with corresponding legislation of RT;
- conducting of scientific researches, monitoring and establishment of collaboration in sphere of POPs, their alternatives and potential POPs with taking into consideration the limits of existing financial and technical resources;
- elaboration and inculcation of information exchange methods for all involved and interested parties on national and international levels;
- rendering support in sphere of establishment collaboration between public community and partners on all levels of chemicals' management and observation of chemical safety;
- supporting to the right-time and regular providing public community with information on POPs, their effects, and measures conducted by state and private bodies on minimization and elimination of POPs;
- dissemination of information about undertaken measures on Convention realization, reflected in NIP, and about efficiency of these measures.

NIP is not only the environmental document. In this Governmental document are clearly specified the responsibilities of all interested parties and partners. Such collaboration will allow reflecting the great interest and necessity of chemicals management, including POPs. Every partner should understand his task and be responsible for its implementation. Involvement of various partners is the essential condition for solution of POPs problem.

Inclusion of NIP to the National Priorities; key issues. Initial purposes and requirements of resources.

NIP is connected with strategy of sustainable development, and also it is the initial political instrument for elaboration of national programs on chemicals management; it should be integrated to the policy of national development and environment protection of RT and to the Strategy on Poverty Reduction.

In accordance with elaborated "National Ecological Strategy of the Republic of Tajikistan for 2006 – 2015" is planned to elaborate the Pro-

gram on POPs monitoring and management. National Ecological strategy is connected with Project "National Strategy of development of the Republic of Tajikistan till 2015" and its section "Ecological Sustainability", which was approved by Government of RT and supported by international institutes for achievement of Millennium Development Goals by RT.

The priority POPs problems, which should be solved in Tajikistan, are following: conducting of full-scale inventory of all POPs categories; improvement of legislation in sphere of chemical safety and establishment of mechanism on its realization; creation of unique system on POPs management; capacity building on POPs management.

As to intentionally produced POPs, listed in Annex A, Part I of Convention, it is intended to stop the use and eliminate following pesticides: aldrin, dieldrin, endrin, chlordane, heptachlor, HCB and toxaphene. Use of PCB-containing electro-technical equipment should be stopped by 2011; and ecologically safe removal of PCB-containing fluids and PCB-containing equipment (PCBs > 0,005 %) should be realized not later than 2013 (Annex A, Part II of Convention).

DDT relates to chemical substances of limited use (Annex B of the Convention) – it is the chemical for elimination of carriers of hazardous diseases: malaria, encephalitis and plague.

As to unintentionally produced POPs, it is intended to prevent or reduce emission of chemical substances, listed in Annex C, Part I of Convention.

By inclusion of new POPs to A, B and C of Convention (Article 8) should be used the appropriate mechanism in accordance with criteria of new POPs selection, which are indicated in Annex D.

For achievement of Convention's purposes, the Party of Convention, which relates to the countries with economy in transition, has the right to receive the gratuitous and favorable financial support. Financial resources are allocated for covering of agreed expenses for realization of appropriate for the country measures:

- implementation of Stockholm Convention commitments in accordance with priorities, specified in NIP, and program priorities, approved by Conference of Parties;
- strengthening of capacity on involvement of high-skilled personnel of national and regional level.

Republic Tajikistan (RT) corresponds to the requirements of the financial mechanism of the Convention. Ratification of Stockholm Convention by RT allows receiving the international financial, technological and informational resources. GEF is the financial mechanism of Stockholm Convention.

Strategic directions of NIP of the Stockholm Convention on POPs:

1. in sphere of POPs-containing pesticides:

- improvement of legislative and normative base, regulating the management of obsolete and forbidden pesticides, including POPs-containing ones;
- establishment of unique database on storages of POPs-containing pesticides. For this purpose, it is necessary to involve all interested ministries and agencies; to conduct the detailed inventory irrespective of property form of pesticides storage facilities, former agricultural air-fields, storages facilities of veterinary services; and to reveal new places of pesticides storing and burying;
- conducting of detailed examination of pesticides burial places: hydro-geological researches; inventory of buried pesticides, including POPs-containing ones (on archive data). In case of necessity, pesticides should be extracted, repackaged and kept in special places till their ecologically safe elimination. Also, it is necessary to remediate the pesticides burial places accordingly to appropriate sanitary-hygienic and ecological requirements;
- building of new and reconstruction of existing storage facilities for temporary storing (till destruction) of repackaged obsolete and forbidden pesticides in accordance with international standards;
- organization of system on collection and transportation of obsolete and forbidden pesticides, including POPs-containing ones, to the places of their temporary storing and elimination;
- assessment of existing technologies on destruction of hazardous wastes, including POPs-containing pesticides;
- determination of ways for destruction of obsolete and forbidden pesticides:
  - to asses the possibilities for destruction of obsolete and forbidden pesticides by use of production facilities in Tajikistan;
  - to realize the transportation of obsolete and forbidden pesticides to other countries, which have experience of such destruction and where is conducted the monitoring of dioxins and furans emission;

- conducting of regular monitoring on revelation of territories and economical objects, which are contaminated by POPs-containing pesticides;
- establishment of analytical laboratory on implementation of program on POPs-containing pesticides monitoring in environmental components (soil, plants, water: surface and collector-drainage), food-stuff and bio-substrates.

2. in sphere of PCBs:

- elaboration of legislative and normative-methodical base, regulating PCBs management;
- conducting of detailed inventory of electro-technical equipment and PCB-containing/ contaminated wastes (on local and administrative levels) for establishment of unique database;
- preparation of schedule on decommissioning of PCB-containing electro-technical equipment in all enterprises irrespective of property form and departmental belonging, which should be oriented on stopping use of this equipment by 2011;
- elaboration of strategy on purchasing import alternative substances for replacing of PCBs in exploited electro-technical equipment;
- assessment and determination of place (region, enterprise) for temporary storing (till destruction) of decommissioned PCB-containing electro-technical equipment and wastes;
- organization of system on collection and transportation of decommissioned PCB-containing electro-technical equipment and wastes to the places of their destruction;
- determination of ways for destruction of PCB-containing electro-technical equipment and wastes:
  - destruction of PCB-containing electro-technical equipment and wastes by use of production facilities in Tajikistan;
  - transportation of PCB-containing electro-technical equipment and wastes to other countries, which have experience of such destruction and where is conducted the monitoring of dioxins and furans emission;
- preparation of plan on elimination of PCB-containing electro-technical equipment and wastes by 2012;
- establishment of analytical laboratory on implementation of program on PCB monitoring in environmental components (soil, plants, water: surface and collector-drainage) and food-stuff.

3. in sphere of unintentionally produced POPs:

- elaboration of legislative and normative-methodical base for regulation of unintentionally-produced POPs (uPOPs) emissions;
- revelation and assessment of not registered categories of uPOPs emissions;
- inculcation of BAT and BEP for reduction of uPOPs emissions in the sector of medical wastes elimination and by uncontrolled combustion of solid municipal wasted in the open air;
- rendering support to BAT and BEP implementation in sphere of:
  - sources in framework of categories, specified in Part II Annex C and sources, which are specified in Part III Annex C of the Convention; and
  - new sources in framework of categories, specified in Part III Annex C, which are defined as requiring measures in the limits of Action Plan;
- Revelation of “hot spots”.

4. in sphere of POPs in storages and wastes:

- elaboration of legislative and normative-methodical base for realization of ecologically safe management of storages, wastes, obsolete productions, which contain POPs or are contaminated with POPs.
- observation of safe, effective and ecologically reasonable management of POPs storages, undertaking all appropriate measures by their collection, treatment, transportation and storing;
- elaboration and realization of appropriate strategy on revelation of POPs-containing storages and wastes and on revelation of POPs-contaminated territories;
- elaboration of proper system for management of medical wastes and solid municipal wastes;
- removal of wastes by the methods, which would guarantee that available in them POPs will be destroyed or irreversible transformed, i.e. they should not have POPs properties; or they should be removed by another ecologically safe method;
- the wastes shouldn’t be removed by methods, which can lead to recuperation, recycling, utilization, direct re-use or alternative use of POPs;
- to prevent transition of wastes trough state borders without observation of international rules, standards and approved principles.

1. INTRODUCTION

POPs are included to the special group of organic chemicals, representing various classes of combinations with hazardous biological properties and steadiness in environment. This elements and combinations are characterized by good solubility in fats and low solubility in water; they are destroyed very slowly by natural factors, and they can accumulate in eco-systems, influencing on them extremely unfavorably. Mostly, POPs are accumulated biologically in the upper trophic levels in such concentrations, which negatively effect both on peoples and environment. Moreover, POPs are moved to the long distances and may be revealed in the regions, where they never produced or used. Even in small quantities, POPs may destroy the normal biological functions; they may be transmitted to next generations; that is why it is the real threat for human health and environment.

POPs problem is the new one for Republic of Tajikistan, so there is lack of public information concerning use of these chemicals in economical sector, concerning their emission to the atmosphere and their effects on human health and environment. These data either never collected, or didn't publish on some reasons.

POPs problem is now of a global significance because POPs are spread all over the world; so the priority task of humankind is to reduce POPs emissions in all regions including Arctic and international waters. During last years, the POPs risk is the reason of growing concerns in many countries of the world. It led to the planning and acceptance of measures on protection of human health and environment on national, regional and international measures.

Stockholm Convention on POPs. International Agreement on POPs Tajikistan, which was called "Stockholm Convention on persistent organic pollutants", was accepted and opened for signing in Stockholm, Sweden, on 22nd – 23rd May 2001.

Stockholm Convention on POPs came into force on 17th May 2004 after its signing by 50 countries. At the end 2006, 152 countries signed and 130 countries ratified the Convention. CIS countries, who signed the Convention are: Kazakhstan (2001), Ukraine (2001) and Russian Federation (2002); who ratified the Convention are: Armenia and Azerbaijan (2003), Belarus and Moldova (2004), Georgia and Kyrgyzstan (2006). The First Conference of Parties was conducted in Uruguay (Puenta del Este city) from 2nd to 6th May 2005. The Second Conference of Parties was conducted in Switzerland (Geneva).

Republic Tajikistan (RT) signed the Convention on 22nd May 2002. On 6th December 2006, Tajikistan ratified the Stockholm Convention on POPs (Statement of Majlisi Namoyandagon Majlisi Oli (Parliament of RT) No. 417). Instrument of Ratification was received by UN Secretary General, who is the authorized person, on 8th February 2007 (Registration No. C/ N/ 191/ 2007/ TREATIES-4). The convention came into force in RT on 9th May 2007 in accordance with Article 26 (2) of convention.

To the list of Stockholm Convention were included 12 toxic substances, the most hazardous for human health and environment: chlorine-containing pesticides – aldrin, dieldrin, endrin, mirex, chlordane, heptachlor, hexachlorobenzene, DDT, toxaphene (Annex A, B); industrial POPs: polychlorinated biphenyls (PCBs) (Annex A), PCDD (dioxins) and PCDF (furans) (Annex C), in elimination of which the majority of countries are interested.

Purposes of Convention. Stockholm Convention on POPs in the main achievements of international society.

The main purpose of Convention is protection of human health and environment from POPs effects, the achievement of which will be possible if following tasks will be solved:

- liquidation or reduction of hazardous POPs, beginning from 12 the most toxic combinations;
- supporting to transition to the more safe alternative substances;
- revelation of additional POPs for undertaking of appropriate measures
- elimination of old POPs-containing storages and equipment;
- establishment of collaboration for POPs-free future.

Stockholm Convention on POPs includes following measures:

- reduction and removal of emissions, as a result of intentional production and use (Article 3);

- reduction and removal of emissions, as a result of unintentional production and use (Article 5);
- reduction and removal of emissions, connected with storages and wastes (Article 6);
- elaboration of strategies on revelation of territories, contaminated with chemical substances of Annexes A, B and C) (Article 6);
- inclusion of new chemical substances to Annexes A, B and c (Article 8);
- information exchange (Article 9);
- public awareness raising (Article 10);
- conducting of scientific researches and monitoring (Article 11);
- rendering of technical support and mechanisms of financing (Article 12, 13);
- submission information to the Conferences of Parties about undertaken measures on realization of the Convention's provisions (Article 15).

Key provisions of the Convention. In the Article 3 and Annexes A and B are specified the responsibilities of the Parties:

- prohibition and/or acceptance of legislative and/or administrative measures on stopping import and use of chemicals, listed in Annex A. By the moment of coming the Convention into force, the Annex A includes following chemicals: aldrin, chlordane, dieldrin, endrin, heptachlor, HCB, mirex, toxaphene, and PCBs;
- reduction of production and use of chemicals, listed in Annex B accordingly to provisions of this Annex. The only chemical, specified in Annex B on the moment of coming Convention into force, is DDT;
- prohibition and/or acceptance of legislative and/or administrative measures, which are necessary for reduction of import and export of chemicals, listed in Annex A accordingly to paragraph 2, where is specified conditions when import and export are allowed, for example: every Party should guarantee that chemicals of Annexes A and B would be imported for such purposes, which are not harmful for environment, in accordance with paragraph 1(d) Article 6; and for purposes, permitted by Parties accordingly to Annexes A and B of the Convention.

Activities, conducted in the Republic of Tajikistan (RT) on POPs problem solution. With the purpose to implement work on realization of Stockholm Convention on POPs in RT, GEF granted the financial sum in amount USD 500 000. In January 2004, the implementation of GEF/UNEP Project "Enabling Activities for the Development of a National Plan for Implementation of the Stockholm Convention on POPs in Tajikistan" started. In 2006 this project was completed. The main purpose of project was in assessment of POPs situation in Tajikistan and in elaboration of NIP on realization of Stockholm Convention on POPs in Tajikistan.

In the NIP are presented measures, which were determined by republic for implementation of its commitments in framework of the convention, and in particular: establishment of national institutional system on regulation of POPs treatment by means of corresponding administrative, economical, informational and other instruments; on elimination of obsolete and forbidden pesticides, including POPs-containing ones; on revelation and management of POPs-containing wastes; on revelation of POPs sources in the country. NIP will contribute to inclusion of POPs problem to the plans and strategies, which are intended on development of social, economical and industrial sectors in the country.

Commitments of RT, as the Party of the Stockholm Convention on POPs. After ratification of the Stockholm Convention, RT obtained the status of Party of this Convention. As the Party of Convention, Republic Tajikistan is dealing with following:

- elaboration and realization of NIP in accordance with provisions of Stockholm Convention;
- submission of NIP to the Conferences of Parties in one year from the date of the coming Convention into force in the country;
- appointment of the Focal Point on Stockholm Convention on POPs in RT;
- regular submission of reports to the Conferences of Parties about implementation of Convention's provisions, and about effectiveness of undertaken measures;
- elaboration of law on POPs and improvement of existing legislative and normative-methodical acts on POPs management;
- periodical review and updating of NIP in accordance with procedure, determined by Conference of Parties;
- undertaking measures on reduction or elimination of emissions from anthropogenic sources on every of all chemical substances, listed in Annex C of the Convention, for their constant reduction and, where it will be possible, their complete stopping;

- undertaking measures on reduction and liquidation of storages and wastes, containing chemical substances listed either in Annex A or Annex B of the Convention, including obsolete productions, which became wastes and contain or are contaminated with chemical substances listed in Annexes A, B and C;
- in case of necessity and in accordance with special procedure on inclusion of additional POPs to the list, RT is submitted to the Secretariat its suggestions about inclusion of what-ever substance to the Annex A, B, and/or C of the Convention, including identification data on this chemical substance and information on selection criteria: resistance, bio-accumulation, ability of transference on long distance in environment and unfavorable consequences;
- realization of information exchange with Conference Parties in sphere of reduction and elimination of production, use and emissions POPs and POPs alternatives, including information, connected with POPs risks and socio-economical expenses, and also establishment of National Coordination Center for exchange of such information;
- rendering support to the process of awareness raising of public community and state officials in sphere of POPs problem;
- in framework of country's capacity, rendering support to and/or realization of scientific researches, monitoring and collaboration in sphere of POPs, their alternatives and potential POPs, on national and international level.

Mechanism, used for conducting of POPs inventory.

Methodology of conducting inventory of POPs-related pesticides. The organization of obsolete and forbidden POP-containing pesticides was following: On the base of letter of the State Committee on Environment Protection and Forestry (SCEP&F) from 30.07.04 No. 809/1-8, the Government of RT issued the Statement No. 60384(19-3) from 10.08.04 about inventory of obsolete and forbidden POP-containing pesticides. For implementation of Governmental Statement, SCEP&F issued the Order No. 132 from 03.09.2004 "About conducting of inventory storage facilities for obsolete and forbidden pesticides".

For conducting of inventory of obsolete and forbidden POP-containing pesticides, Chairman of SCEP&F prepared and approved following documents: "Technical Manual on conducting inventory and identification of obsolete and forbidden POP-containing pesticides", "Instruction on conducting inventory of POP-containing pesticides" and "Manual on safety measures and private hygiene during conducting inventory and taking samples of pesticides, soil and plants". In these documents are presented the general principles of conducting inventory of obsolete and forbidden pesticides, and also the inventory reporting forms.

Methodology of conducting PCB inventory. Organization of PCBs and PCB-containing inventory was following: On the base of letter of the SCEP&F from 30.07.04 No. 809/1-8, Government of RT issued the Statement No. 60384(19) from 10.08.04, obliging Ministry of Energy, Ministry of Industry, Ministry of Economy and Trade, Ministry of Agriculture, State Statistics Committee, Tajik Railway Station, State Air-Company "Tajikistan", Tajik Aluminum Factory, State Enterprise "Vostokredmed" to conducting inventory of fluids and PCB-containing electro-technical equipment (transformers and capacitors). For implementation of this Statement were issued the Order of Ministry of Energy No. 219 from 03.09.04 and Order of Ministry of industry No. 119 from 19.11.04. Ministry of Energy submitted the request Ministry of Defense of Republic Tajikistan and 201st Military Division of Russian Federation in RT.

For conducting of inventory of PCBs and PCB-containing electro-technical equipment and materials was prepared "Manual on inventory of industrial POPs" and Annex to this Manual. Annex contains the information about main physic-mathematical and toxicological properties of PCBs, about trade names of PCB-containing materials, about models of PCB-containing transformers and capacitors, about sectors of their use, and about possible objects of PCBs and PCB-containing materials availability.

POPs problems in Tajikistan. Tajikistan never produced the chemical substances for combat of agricultural pests and weeds, and also PCBs and PCB-containing equipment. The main sources of contamination environment with POPs are following: obsolete and forbidden POPs-containing pesticides; POPs-containing electro-technical equipment; technological processes in the industry, including combustion of fossil fuel and woods, stipulating unintentional production of PCDD and PCDF.

The most significant POPs group, which use should be forbidden or reduced, is organochloric pesticides (OCP). Excluding HCB, which

was used as fungicide, other pesticides were used as insecticides (endrin was used also as zoocide). Some of these substances were used in veterinary. Nowadays, in the economical sector of economy in RT there is a problem of obsolete and forbidden pesticides elimination.

The condition of majority of pesticides storage facilities doesn't correspond to sanitary-hygienic requirements: aleak roofs, lack of doors and windows and etc, and it is the serious threat for human health and environment.

The current condition of existing Vahshski and Kanibadamski pesticides burial places, where about 10,5 thousand tons of pesticides are buried, including 40% of organochloric pesticides and 3,1 thousand tons of DDT, don't correspond to standard requirements. The problem on extraction and destruction or re-burying pesticides with their preliminary repackage is very sharp.

The special attention should be paid to elimination of pesticides' containers, which are available in burial places. During inventory, it was revealed that in storage facilities there is rather small quantity of empty pesticides' containers. The great number of empty 5 – 10 liters containers is used by population for domestic needs and then they are thrown to the municipal dumps or to other places, which are not intended for such kinds of wastes.

During initial inventory were revealed 13 transformers and 3 thousands capacitors containing PCBs. The part of PCB-containing electro-technical equipment was decommissioned, but the conditions of its storing don't correspond to the special requirements. This equipment is storing on the industrial territories without any precautionary measures; that is why it is potentially dangerous in case of its depressurization.

The preliminary assessment of emissions of unintentionally produced POPs (dioxins and furans) showed that main sources of formation these substances in republic are: enterprises on production and processing of metals, production of electric power and thermal energy and uncontrolled combustion.

2. COUNTRY INFORMATION

2.1 GENERAL INFORMATION

Map 2.1.1.1 Republic Tajikistan, Administrative Map

2.1.1. Geography and population

The Republic of Tajikistan is situated in the southern part of Central Asia between 360 40' and 410 05' of north latitude and 670 31' and 750 14' of east longitude. The territory of Tajikistan is 143 100. The area of Tajikistan is 143 100 km2. The area stretches West-East for 700 km, and North-South for 350 km. The total length of the Tajik boundaries is 3000 km. The boarder with Kyrgyzstan is 630 km, with Uzbekistan – 910 km, with China – 430 km, and with Islamic Republic of Afghanistan 1030 km. Peculiarities of frontiers' regime with neighboring states – members of NIS and difficulties of relief on some frontier parts stipulate the possibilities for illegal import of forbidden agricultural preparations, including POPs, to Tajikistan. In the markets of republic there is a free sale of "Dust", may be that under this name is sold DDT and HCH, because the Customs Services haven't any data concerning import of these substances; this factor confirms that these preparations are imported to the republic illegally.

RT includes following administrative regions: GBAO (7 districts and 1 city), Sugd region (12 districts and 6 cities), Hatlon region (21 districts and 5 cities), RRS (13 regions of republican subordination) and Dushanbe city – the capital. Natural and historical conditions stipulated the great unevenness in distribution of population on the territory of republic. More than 85% of population is concentrated in the regions till 1500 – 1800 m over the sea level. The Tien-Shan, Gissaro-Alai and Pamir mountain systems cover about 93% of territory. The absolute height points are from 300 to 7405 m. Valleys and inter-mountain cavities are the main places, where settlements and agricultural fields are located. Density of population is here over 200 peoples per 1 km2 (Gissarskaya and Vahshskaya Valleys, northern regions of the country); density of population in the capital of republic is over 4 000 peoples per 1 km2. In the mountainous regions of republic, the density of population is about 4 – 10 peoples per 1 km2. The less populated territory of the country is Eastern Pamir, where density of population is less

that 1 person per 1 km2. Nowadays, the average density of population in Tajikistan is 48,8 peoples per 1 km2.

Total number of population of RT is 7,0 millions peoples (2006), including 73,5% of rural population. Average number of family-members in rural localities – is 6,5 peoples; in urban localities – 4,5 peoples. Average size of farmer's plots is about 21 ha. Distribution of population in 4 main regions and capital is following: Hatlon region – 35,1%; Sugd region – 30,5%, RRS – 22%; Dushanbe 9,2% and GBAO – 3,4%.

Average age of population in Tajikistan is 22,9 years. Number of population under 15 years is 42,7%; number of children under 9 years is more that 30%. The most vulnerable part of population for POPs effects are children under 14 years, whose number in Tajikistan is about 5,3%, and peoples of pensionable age – 5,3%. Correlation of women and men is almost equal – 50,5.

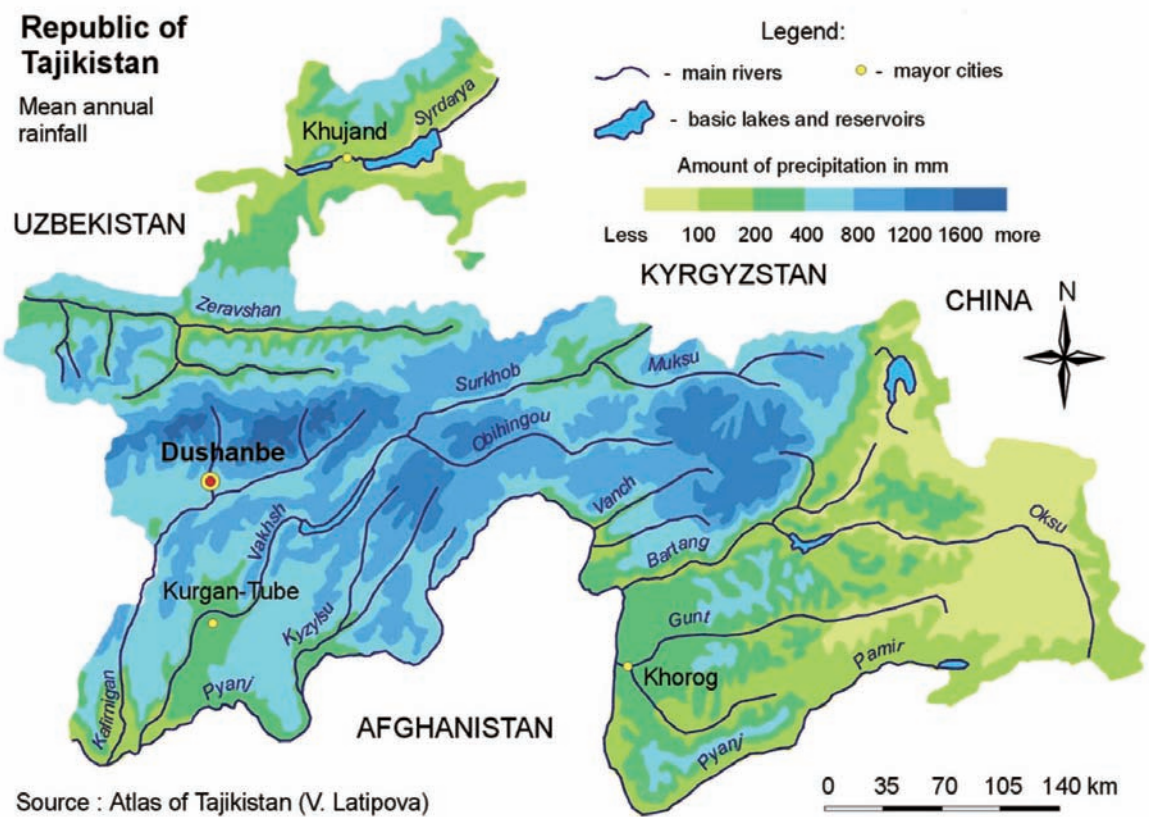
In accordance with index, determined yearly by UN, Tajikistan is on the 122nd place (2005) among examined states.

Climatic conditions of Tajikistan depend closely on its orographic conditions. Tajikistan is located in the most northern part of subtropical zone of our planet. The peculiarity of Tajikistan's geographical location is in the fact that it is located in the middle of Euro-Asia continent, far from open seas and oceans, i.e. there is no way to the sea; that is why climate is pronounced continental, characterized by sharp seasonal and daily changes of meteorological elements – significant seasonal and daily fluctuations in air-temperature; intensiveness of solar radiation; dryness of air and small cloudiness. Average annual temperature is in the limits from +17,2 0C (Shaartuz city, RRS) to -1,1 0C (Murgab, Eastern Pamir).

Territory of Tajikistan is divided into 2 big climatic zones: Front-Asian and Central-Asian, which are characterized by various annual volume of precipitation. Average annual norm of precipitations is from 73 mm in Eastern Pamir to 1500 mm and more in southern mountainside of Gissar mountain range.

Total duration of solar radiance in Tajikistan varies from 2097 to 3166 hours per year. Average annual number of radiation is 151 – 176 large calorie/cm2. Due to cloudiness and mountainous relief, the real duration of solar radiance is 50 – 70% from potentially possible.

Climatic characteristics of Tajikistan contribute to increasing of contamination environmental components with POPs, and also they stipulate their transmission to the long distances from the sources of emission, especially in period of dust storms.



Map 2.1.1.2 Average Annual Quantities of Precipitations

Tajikistan is the large center of Central Asian glaciation. The total territory of glaciers is 8,4 km2, it is 6% of all territory of the country. The main volumes of ice are concentrated in mountains of West Pamir. Glaciers – is the great richness of Tajikistan, because it is not only depository of waters, but also the regulator of river flow and climate. Researches of last years, conducted in high-mountainous ecological systems of Northern America and Himalaya Mountains, confirmed the availability of higher POPs levels in various elements of these systems, including glaciers. Glaciers are the natural "cold" traps for POPs and, simultaneously, channels for their quick transmission to the river systems, because the forming water from melted snow usually has not the direct contact with sorbent soils. Combination of climatic conditions in Tajikistan, including availability of south-western air-currents with significant vertical amplitude is the favorable condition for accumulation of POPs in high-mountainous lakes of Pamir.

In republic there are 947 rivers, length of which is more than 10 km. The main part of river-system in Tajikistan relates to the river basins of main rivers in Central Asia – Amu Darya and Syr Darya, flowing to Aral Sea. It is one of the ways for transmission POPs beyond Tajikistan by water, and it contributes to POPs concentration in some without-flow territories of Central Asia.

2.1.2. Political and economical profile of the country .

The independency of the Republic of Tajikistan (RT) was declared on 9th September 1991. In 1992, Tajikistan was admitted to UN.

Accordingly to Article 1 of the Constitution, the republic of Tajikistan is sovereign, democratic, jural and unitary state. The Head of State is President.

State authority consists of 3 branches:

1. Executive authority;
2. Legislative authority;
3. Judicial authority.

Executive authority. In Tajikistan is accepted the President system of governing. President, in accordance with Constitution of RT, is simultaneously the Head of State and the Head of the Government.

President is the guarantor of Constitution and laws, he determines the state policy, including environmental issues; he approves the state programs; he coordinates the functioning and interconnections of state bodies and controls the observation of international agree-

ments; he accepts the Statements, approves economical guidelines and limits of nature resources use, determines the size of taxes for nature resources use and for contamination of environment. President has the right to issue orders and decrees on all social issues.

Government of RT is the guarantor of effective implementation of laws, Statements of Majlisi Oli, Orders and Decrees of the President, including distribution of functions between members of government: ministers and chairmen of state committees.

Legislative authorities. In accordance with the Article 48 of the Constitution: Majlisi Oli – Parliament of RT is the higher representative and legislative body of RT.

Majlisi Oli consists of Majlisi Milli and Majlisi Namoyandagon.

There are 5 committees in Majlisi Milli, including Committees on agricultural issues, employment and ecology, social issues, health care, culture, and also on women's and youth policies in society.

Majlisi Namoyandagon accepts the legislative acts, determines the regime of governmental bodies' activities, including agencies on nature resources use and protection. Majlisi Namoyandagon approves the Decrees of the President of RT, ratifies and denounces the international agreements, including environmental issues. There is the Committee in structure of Majlisi Namoyandagon, which controls the social, family, health care and ecological issues. The competence of this Committee covers legislative initiative, preparation and agreement of legislative drafts in sphere of environmental issues regulation, including handling with pesticides and other harmful chemical substances, and also the issues of nature resources use.

Judicial authority. Judicial authority is realized in Tajikistan by Constitutional Court, Supreme Court, Higher Economical Court, Military Court, Court of GBAO, and regional, cities' and districts' courts.

Main economical indicators. In last years, following factors had the positive influence on socio-economical development of the country: expedition of economical reforms realization, directed on further macro-economical stability, on increasing role and significance of private sector in economy, on strengthening of structural reforms in capital construction, agriculture and other economical branches, on improvement of industrial policy, including creation of favorable conditions for producers' access to material and technical resources and optimization of taxation; realization of administrative reforms and development programs in social sphere.

In 2005, the macro-economical grows was registered almost in all economical branches. In 2005, the GDP in existing prices of corresponding years was 7206,6 millions somoni; in 2004 - 6167,2 millions somoni, in 2003 - 4761,4 millions somoni. In per capita calculation, in 2005 GDP increased at 14,4% in comparison with 2004.

● *Main macro-economical indicators of socio-economical development of RT*

Macro-economical indicator	Year									
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Gross Domestic Product, growth rate in % to the previous year	83,3	101,7	105,3	103,7	108,3	109,6	110,8	111,0	110,3	106,7
GDP per capita, in USD	183,9	158,7	221,8	178,2	158,0	171,2	190,0	236,7	309,6	337,5
Investments to the main capital, in millions of somoni	26,6	67,5	68,3	122,5	108,6	194,8	206,9	318,4	592,0	682,5
Gross output of agriculture; growth rate in % to the previous year	94,0	97,5	100,9	100,9	112,6	106,6	116,8	109,0	111,3	101,6
Gross output of industry; in %	76,1	98,0	108,2	105,6	109,9	115,0	108,4	109,9	115,1	110,4
Capital investment to environment protection and rational nature resources use in current prices; thousands of somoni	152,0	169,0	179,0	148,0	1344,0	1159,0	733,	539	16715	12109

Source of information: Statistics Year-Book of the Republic Tajikistan (Official issue), 1991-2005, Dushanbe city.

Increasing of GDP growth rate was stipulated by stabilization of exchange rate of national currency, control of state finances balance, strengthening of currency system and stimulation of external trade sector.

2.1.3 Profile of economical sector.

Agriculture. Tajikistan is the agrarian-industrial republic; the territory of agricultural fields is about 901,1 thousand ha, including about 300 thousand ha used for main culture - cotton. About 1,7 millions ha belong to the State Forestry Fond. The irrigated fields are used intensively; the receiving of two harvests of crops and vegetables per year, 5 – 8 harvests of lucerne is a common practice; also the subcovering and combined cultures. In Tajikistan, development of agriculture and, first of all, cotton-growing, is closely connected with use of pesticides for combating agricultural pests, plant diseases and weeds. Agro-climatic conditions of republic are favorable for quick reproduction and development of many agricultural pests. Besides, the high level of various plant diseases is registered. Agricultural crops are affected by weeds, especially in irrigated zones, where their seeds are brought in great number with irrigation water. It was determined, that potential losses of harvest by low efficiency of protective measures are near 30%.

Agriculture is the main economical sector in Tajikistan, forming 24,2 GDP (2003). In this sector are employed about 67% of workable population; here is produces about 11% of export productions. Almost 1/3 of population lives in rural localities, and agriculture is the main work in life of these peoples. Agriculture has its negative effects on environment; excessive irrigation, wrong use and storing of agricultural chemicals are the reason of significant ecological problems, i.e. contamination of soil, subsoil and surface waters, and also other environmental components. Till 90th years of the last century, the annual delivery of pesticides to Tajikistan exceeded the real demand, and it was the reason of their accumulation in storage facilities.

Agrarian sector, as the whole economy in Tajikistan, experienced the serious economical crisis in first half of 90th years. However, beginning from 1998 started the gradual growth and rehabilitation of this sector: in 1996, the volume of agricultural gross output was 52,3 % from the level of 1991; in 2001 – 62,3%; in 2003 – 79,3%; and in 2005 – 89,7%.

In 2003, agricultural gross output on all categories was 2215,69 millions somoni (in current prices); in comparison with 2002 it increased at 9,0%.

The main agricultural product in Tajikistan is cotton, by growing of which were used significant volumes of various chemicals, including preparations for plants protection. Assortment of pesticides included more that 80 kinds of preparation with various chemical compositions: organochloric (aldrin, hexachlorobenzene, heptachlor, dieldrin, DDT, toxaphene, chlordane and endrin), phosphorus-organic, mercury-containing and others.

Pesticides were used unreasonably wide, with involvement of agricultural air-planes; the repetition factor in republic was 10 times, and it led not only to contamination of environment but also to destruction of balance between harmful and useful insects in agro-ecological system.

Tajikistan never had and hasn't now any enterprise for production of pesticides. All agricultural chemicals for plants protection are delivered from other countries. During period from 1950 to 2003, the volume of imported to RT pesticides was 710 thousand tons.

At the end of 80th years, total volume of used pesticides all over republic was about 12 – 15 kg per day for 1 ha of agricultural field and perennial plants. In some districts of Hatlon region this indicator exceeded the average figures 1,5 – 2 times, and in certain households it reached 50 kg per ha ("Vahsh" farm, Vahshski district).

Intensive use of pesticides in republic predetermined the contamination of environment with residuals of used pesticides.

As a result of restructurings in agricultural sector and in economical sector of republic in whole, the use of pesticides is significantly reduced. However, the consequences of ecological damages are now obvious on local level, especially in places, where obsolete and forbidden pesticides are storing.

Special anxiety is stipulated by unsatisfactory keeping of pesticides, including POPs-containing ones, which leads to significant contamination of environment. In Tajikistan was never conducted any assessment of risk, connected with storages and wastes of pesticides, especially POPs-containing ones. In many cases, the exact location and condition of contaminated territories is absolutely unknown.

Undoubtedly, it is necessary to improve the programs of monitoring and elimination of obsolete and forbidden pesticides for prevention of serious ecological problems in future.

Nowadays, the state agricultural policy is

directed for increasing of production, i.e. increasing of agricultural productivity. It may be reached not only by development of marginal lands, enlargement of irrigated territories and strengthening of their use intensiveness, but also by increasing application of chemical fertilizers and agricultural pesticides.

Industry. In Tajikistan, beginning from second half of 20th century it was observed the intensive development of mining industry on extraction of silver, mercury, antimony, lead, gold, and also on processing of rare-earth elements. In structure of existing industry the non-ferrous metallurgy predominates. In 1975, Tajik Aluminum Factory was placed in operation; it was one of the largest factories on aluminum production in the former USSR. The share of non-ferrous metallurgy in total volume of production in 2003 was 44,6%; in 2004 – 46,0%; in 2006 – 42,1%.

Also in Tajikistan is developed machine-building, chemical, cotton-processing, light and food industry (diagram 2.1.3.1). Contribution of industry to the GDP in 2003 was 30,0%.

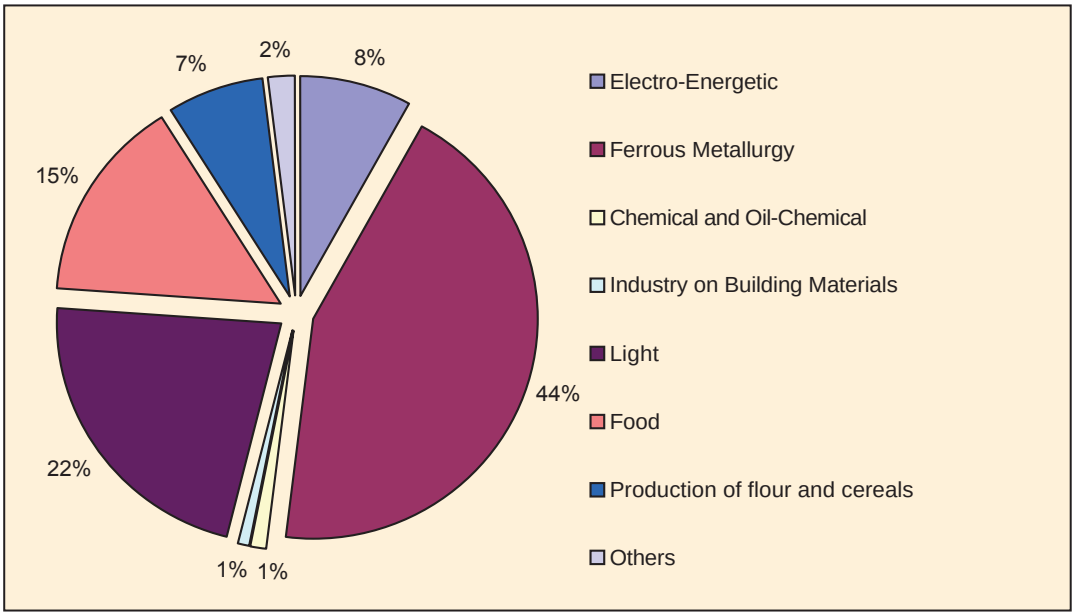


Diagram 2.1.3.1 Industrial structure of Republic Tajikistan (2003)

The building industry developed rather quickly. There are in republic 19 brick-works (in 2003 were produced 32,5 million pieces of bricks; in 2004 – 33,1; in 2005 – 45,9); several large enterprises on production of building materials. In Dushanbe city are functioning factories on production of asphalt, bricks and cement – there is here is the single factory in republic, which productive capacity is 1100 thousand tons of cement per year (in 2003 were produced 166,3 thousand tons; in 2004 – 193,6 tons, in 2005 – 251,1 thousand tons); Building Materials Enterprise ("KSM") produces soft roof coverings, asbestos-cement sheets; Heat and Power Plant and so on.

The main industrial sources of contamination environment with POPs are the machine-building, textile, chemical and petrochemical enterprises, and also non-ferrous metallurgy, processing of heavy metals, Fuel-and-Energy Complex and enterprises of building sector. The share of above-mentioned enterprises in total volume of pollutants' emissions from stationary sources is about 88%. The tendency of more intensive growth (15 - 40%), in comparison with average industrial growth (15%), is observed in building industry and non-ferrous industry, which are the sources of significant emissions of unintentionally produced POPs (dioxins and furans) in RT.

Accordingly to data of State statistics Committee, in 2003, 2004 and 2005, the industrial enterprises used 120,8 thousand tons; 10,5 millions m3 and 16,3 millions m3 of natural gas correspondingly. Consumption of coal in 2003, 2004 and 2005 was 0,2 thousand tons, 15,4 thousand tons and 4,8 thousand tons correspondingly; and consumption of black oil - 11,9 thousand tons, 23,5 thousand tons and 19,4 thousand tons correspondingly. Combustion of these fossil fuels is entailed by formation of unintentionally produced POPs. Following fac-

tors stipulate the suppositions that in nearest years the emissions of unintentionally produced POPs will be not decreased: growth of industrial production, especially in such sectors, where as the source of thermal energy are used coal, black oil or natural gas: building industry, ferrous and non-ferrous metallurgy, and also using of biomass for cooking and heating of houses.

Energy. Tajikistan has not a big amount of fossil fuel. Altogether in republic, 18 deposits of oil and gas and about 40 deposits of coal are explored and registered. Nowadays, in accordance with calculations, the coal production is not effective. In 2003, the coal production was 46,5 thousand tons; gas production 32,8 millions m3, and oil production (including gas condensate) – 17,7 thousand tons.

Development of atomic energy in republic is problematically due to high seismicity of the region and other important conditions.

At the same time, Tajikistan has the great resources in sphere of hydro-energy, which are distributed all over the territory of republic practically equally. Tajikistan takes the 8th place in the world on their volume, and 1st – 2nd place on their share (per capita and on the unit of territory). Share of Tajikistan in hydro-potential of our planet is about 4%. The share of hydro-energy in general structure of energy resources in Tajikistan is about 95%. The total annual potential resources of hydro-energy in republic are more than 527 billions kilowatt; so the hydro-energy is the main electro-energy branch of the country.

Availability of great hydro-power resources determined the direction of energy development in republic, and namely, building of hydro-power-stations (HPS); the total installed capacity of HPS is 4070 thousands kilowatt. The above-mentioned factor allowed placing in Tajikistan such power-consuming enterprises as Yavanski Electro-chemical Plant and Tajik Aluminum Factory, which are the sources of dioxins and furans, and also the users of PCB-containing electro-technical equipment.

Municipal sector. The certain share of POPs emissions, including dioxins and furans, to the atmosphere of urbanized territories relates to enterprises of municipal sector and domestic heating systems of cities and settlements of the republic. The effectiveness of purification measures in municipal sector is near 60%; and in the private sector there are practically no any purification measures. Accordingly to the State Statistics Committee data, energy-carriers consumption in municipal sector in 2003

Photo 2.1.3.1 Dushanbe, Rudaki Avenue.

was following: coal - 0,284 thousand tons of standard coal; natural gas - 447,6 thousand tons of standard coal; oil products (black oil) - 0,096 thousand tons of standard coal. In 2003, for covering of populations' demand was delivered 242, 6 millions m3 of natural gas.

Municipality, as the institutions of social sector (educational, health care, culture institutions and so on), usually have not their own switching stations; the are on the balance of local bodies or large industrial enterprises. Electro-technical equipment, filled in with PCB-containing fluids, practically is not used in social and municipal sectors of republic, excluding Enterprise "Shabakahoi Barki sh. Dushanbe", where the capacitors of KCO-0,38-12,5 type are used.

Transport. Transport in Republic Tajikistan is the integral part of its economy – it is the main element of infrastructure and the most important branch of national economy. Geographical peculiarities of Tajikistan, where mountains occupy about 93% of territory and absolute heights vary from 300 to 7 495 m, stipulated the transportation of peoples and loads, mainly, by vehicles. The total length of highways is about 30,0 thousand km. During last 15 years, the role of railway and air transport in republic decreased significantly; the use of vehicles increased: more than 84% of all loads transportation and 68,4% of peoples transportation inside of country are realized by vehicles.

The source of unintentionally produced POPs in the process of vehicles exploitation is the admixture of dichloroethane to the petrol. Burnt gases of internal-combustion engines contain small number of dioxins and furans – 30 – 540 picogram per 1 km by use of petrol with admixture of tetraethyl- and tetra-methyl-lead; but their concentration may be found along the roads with intensive traffic.

Soil and water in wayside channels and land plots adjoining to the railway, also may be contaminated with dioxin-lake combinations.

2.1.4. Review of environment.

After obtaining of independence, in the republic started to form actively the new ecological policy oriented on strengthening of environmental legislation, expansion of international collaboration and participation in solution of global ecological problems, **including realization of Stockholm Convention on POPs.**

The problem of contamination environment with POPs in republic is connected with agriculture, industry, development of transport sector, and also with consumption of fossil fuels and agricultural wastes for production of thermal energy and electricity for covering of public needs.

Chemicals, used in agriculture, are accumulated in environmental components (soil, water, plants) and foodstuff. Chemical substances, which are used in various economical sectors and are able to accumulate in environment, have the wide diapason of use; they may contaminate during whole life cycle of production, i.e. from the moment of raw material purchasing till final processing and removal of wastes. The factual emissions, concentrations and types of effects on eco-systems, animate nature and human health vary in dependence of chemicals' kinds.

Substances of POPs group may contaminate the environment as a result of their purposive use, for example, as pesticides (aldrin, toxaphene, DDT and others), as contaminating admixtures in other products, or as side products of industrial processes (for example: dioxins and furans).

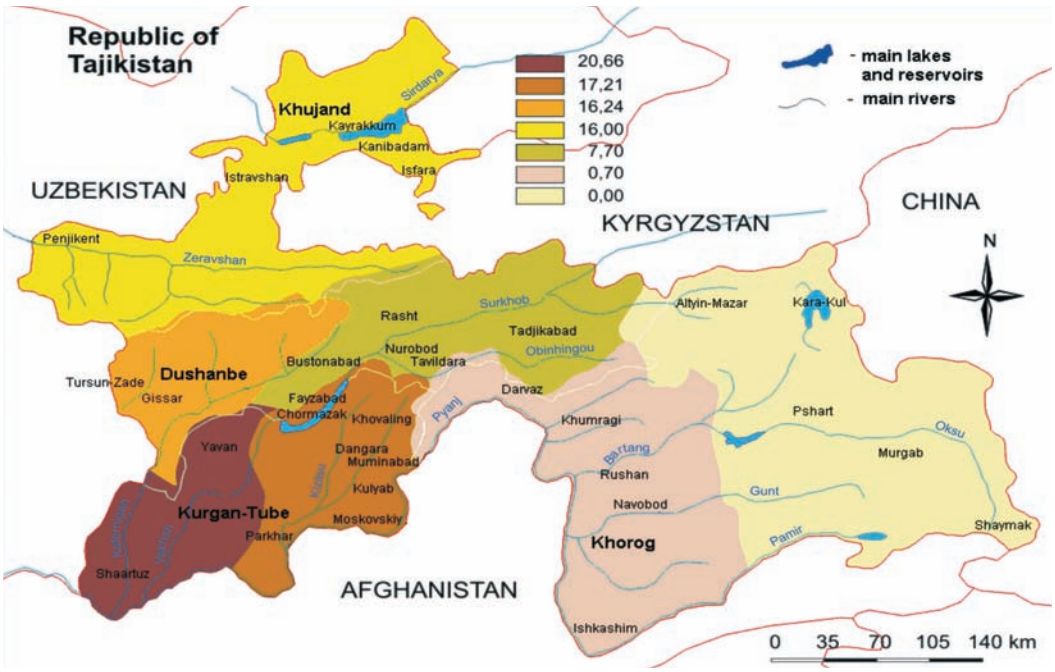
Transmission to the long distances and trans-border spreading of POPs means that these substances pose a threat not only for one country, but also for countries located far away from the sources of contamination.

Other important ecological problem is accumulation of great number of obsolete and forbidden pesticides. The condition of storage facilities for these chemicals in RT often doesn't correspond to the standard requirements.

The reasons of accumulation forbidden and obsolete pesticides are not effective management systems of storing and sale-market, lack of appropriate normative structures, low quality of packaging, purchasing of exceeding numbers of production, and also prohibition for use.

Elimination of obsolete and forbidden pesticides is difficult due to lack of information on their quantity and location, and also due to lack of appropriate financial and technical means.

To the main sources of emissions pesticides to the atmosphere relate the territories in Tajikistan, where the excessive use of pesticides for 1 unit of agricultural field was observed – kg of reactant per ha (map 2.1.4.1). The majority of organochloric pesticides, which are toxic themselves, are contaminated with chlorinated dioxins and furans, the control of which was never conducted.



Map 2.1.4.1 Use of pesticides (reactant) per ha of irrigated agricultural fields (without fellow lands, hayfields and pastures)

The observations of availability DDT and its metabolites, aldrin, heptachlor and HCH in soils, water and plants for the period from 1985 to 1995 confirm the tendency of graduate decreasing of contamination level. The analogical researches in sphere of other organochloric pesticides (OCP) in RT were never conducted formerly and are not conducted in present time.

Influence of OCP on peoples and environment in Tajikistan has its peculiarities. They are determined by high temperature of air and soil, increasing evaporation of pesticides. That is why, the organochloric pesticides are the factor of contamination soil, open water reservoirs, foodstuff of vegetative and animal origin, so they pose the serious threat for human health.

Negative socio-economical consequences of environmental degradation have not equal effects on population groups; the most vulnerable are non-protected social groups. Ecological factors stipulate the appearance or strengthening of problems on al levels, and especially in rural districts.

2.2. POLITICAL, INSTITUTIONAL AND REGULATIVE PRINCIPLES.

2.2.1. Environmental policy, policy on sustainable development and general legislative principles.

From the moment of independence declaration, the environmental policy of Republic Tajikistan is developed accordingly to the legislative and regulatory acts. From year to year, the positive changes in socio-economical sphere of republic are observed; the great attention is paid to solution of environmental issues. In this connection, the important direction of state policy is reformation of state management for liberalization, which is characterized by transition to economical instruments of management, reformation of legislative and institutional mechanisms for establishment of new effective economical and juridical relations in ecological sphere.

During period of sovereignty in Tajikistan, there was created the base of environmental legislation, several environmental agreements were signed, strategies and programs practically in all economical sectors were elaborated and accepted.

In 1997, the State Ecological Program for 1998 – 2008 was accepted for determination of development of Tajikistan in current transitional period. The Program reflects the importance of environment protection for successful economical development in the country. The Program specifies the main tasks, including involvement of all social sectors (government, business structures, non-governmental organizations and public community) to the process of protection and improvement of environmental condition. In the program are listed the urgent practical measures on rehabilitation and supporting of ecological balance: rehabilitation of quality of air, water and other resources; stimulation of local industry for use of ecologically safe raw materials; decreasing of energy consumption by means of introduction of energy-conserving technologies and etc. The Programme includes the complex of measures on utilization of industrial and municipal wastes.

NAPEHP - National Action Plan on Environment and Health Protection (accepted in 2000) was elaborated in accordance with State Health Care Strategy and requirements of international conventions. The priorities of NAPEHP include following: assessment of effects of various environmental components (air, water, soil and wastes) and foodstuff on public health; improvement of services of environmental hygiene; and development of inter-agency collaboration. Plan has two main purposes: assurance of safety, health and well-being of population and environment protection. NAPEHP is directed on joint activities with other national programs and projects in sphere of environmental hygiene: Poverty Reduction Strategy, National Program on Tropical Diseases Control; Program of Tajikistan on Supporting Healthy Life Style till 2010, which is intended to establish the database and monitoring system on environmental hygiene; State Ecological Program for 1998 – 2008, and etc.

In April 2006, Government of Tajikistan approved NAPEHP, oriented on solution of actual environmental for nearest three years.

For improvement of environmental legislation of Republic Tajikistan are used the principles of ecological legislation of developed countries and international standards. Tajikistan jointed to 10 International Environmental Conventions, including such ones, which purposes and tasks correspond to the Stockholm Convention: Vienna Convention on Ozone Layer Protection, Framework Climate Change Convention and Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. Nowadays, on four Conventions (Vienna Convention on Ozone Layer Protection, Convention on Desertification, Convention on Biodiversity Conservation and Framework Climate Change Convention) are elaborated National Action Plans on their realization.

Ratification of international agreements demands legislative assuring of country's commitments. Tajikistan has rather comprehensive environmental legislation (including health and safety), covering 18 Laws and 3 Codes. For the period from 2000 to 2005, following Laws were accepted: "About Nature Protection", "About Ambient Air Protection", "About Wastes of Production and Consumption", "About Protected Areas", "About Ecological Expertise" and etc., also, were accepted: Forest, Water and Land Codes; and a lot of appropriate sub-law acts were approved. However, often the legislation is inconsequent and legally impracticable. So, the majority of ecological laws of RT are interconnected with each other, and changes in one law demands the insertion of changes to other laws, and this factor stipulates breaking of general system of ecological legislation, causes discrepancies between laws and sub-law acts. That is why, in spite of comprehensive legislative base and acceptance of National Action Plans, there are no significant improvements of environmental condition. In future, the reformation of legislation should be directed not to the increasing of legislative acts number but on their systematization and effectiveness raising.

Sustainable development policy. The idea of sustainable development appeared as a result of understanding that potential of natural resources for economical growth is limited, and there is a real threat of possible negative and irreversible changes in the environment. Environment protection is one of the constitutional tasks of RT, together with observation of rights and responsibilities of Tajikistan's citizens.

Understanding the main principles and recommendations of "Agenda 21", accepted in Rio-de-Janeiro in 1992 at the UN Conference on environment and development, Government of RT considers that the transition of country to sustainable development, should guarantee the balanced solution of socio-economical issues, conservation of favorable environment and nature resources. The ecological aspect of sustainable development includes environment protection and rational nature resources use, ecologically safe use of high technologies with taking into consideration the solution of socio-economical problems.

Tajikistan confirmed repeatedly its devotion to the ideas of ecological safety and sustainable development. RT became the member of UN Commission on Sustainable Development and signed the Issyk-Kul and Nukus Declarations (1995), which are oriented on elaboration of Regional Action Plans on sustainable development of Central Asian Region. Tajikistan is the participant of such processes as "Environment for Europe" and "Environment and Sustainable Development for Asia".

In 1998, for effective participation of RT in solution of sustainable development issues Government of RT established the National Committee on Sustainable Development under the leading of Prime Minister. This Committee coordinates the activities of ministries and agencies in the country, who participate in elaboration and realization of sustainable development programs in the country; also, it establishes partnership with international and regional organizations and programs in sphere of sustainable development.

RT is the member of Intergovernmental Sustainable Development Committee (ISDC) of Central Asian countries, the main function of which is organization and coordination of elaboration regional strategy on sustainable development; management of regional programs, action plans and projects of environment protection and sustainable development; coordination of activities, connected with realization of commitments of Central Asian countries in sphere of international ecological agreements; supporting of harmonization of ecological legislation and methods; supporting of inter-state information exchange and establishment of Regional Information Database on environment and sustainable development (National Informational Center within Intergovernmental Sustainable Development Committee). Tajikistan take part in realization of Regional Programme on Environment Protection, elaborated under the aegis of Intergovernmental Sustainable Development Committee by the support of Asia Development Bank, UNEP and UNDP; and in preparation of Framework Convention on environment and sustainable development for Central Asian Countries; also Tajikistan supports the process on preparation of Central Asian Strategy on sustainable development.

In the Document "National Report on Sustainable Development, RIO+10", prepared to the International Summit on Sustainable Development in Johannesburg (2002), is presented the assessment of sustainable development process in Tajikistan and its main tendencies".

The Programme of economical development in Tajikistan till 2010 is intended on poverty reduction, as the background of sustainable development. The Government understands that the environmental problems cannot be solved without paying special attention to the living condi-

tion of populations, especially in rural localities. National Program on Poverty reduction was accepted in 2002. The priority of this Program is strengthening of economical reforms and assurance of sustainable growth for increasing of real income in the country, equal distribution of economical growth's results, and increasing living standard of poorest strata of society.

In March 2007 was accepted "National Development Strategy for 2006 – 2008 and for the Perspective till 2015", where, as an integral part, is included the section "Assurance of Ecological Sustainability". Following documents are under consideration: "National Ecological Strategy till 2015" and "National Strategy on Sustainable Development of Sustainable Development of RT till 2030". These documents were elaborated on the base of "Millennium Development Goals till 2015", "Solutions World Summit in Johannesburg on Sustainable Development" (2002) and "Ecological Strategy for Eastern Europe, Caucasus and Central Asia for the First Decade of 21st Century", the purpose of the above-mentioned documents is determination of activities for ecologically sustainable policy. In the "National Strategy on Wastes Management", which is now on the stage of elaboration, are reflected problems and specified environmental purposes in the wastes management sector till 2015. The main purpose of Strategy is to increase the effectiveness of wastes management. The key issues of Strategy are following: decreasing of wastes formation; selection of wastes in places of their formation; re-use of wastes; sterilization and utilization of wastes; removal and burying of final wastes.

2.2.2. Role and responsibility of ministries, agencies and other governmental institutions, involved to the solution of POPs problem (the whole cycle from the source to elimination, their availability and behavior in environment).

The general structure of the environmental legislation in Tajikistan includes the issue on establishment of close collaboration between local authorities (regional, district and cities' governing bodies) and appropriate ministries for effective implementation of environmental policy. With the purpose of elaboration national policy and standards for solution of such important problems as improvement of air and water quality and management of toxic substances, were established the Environmental Coordination Committees – Inter-Agency Committee on Chemical Safety and Inter-Agency Coordination Committee on Ecological Statistics.

Ministry of Agriculture and Environment Protection and its agencies has the main power for implementation of decisions and coordination of activities of appropriate ministries, departments and institutions dealing with nature resources use, environment protection, observation of environmental law, standards of ecological safety and rehabilitation of nature resources.

Ministry of Agriculture and Environment Protection and its agencies are responsible for the following: implementation of agricultural policy in sphere of use, storing and treatment of pesticides; determination of alternative methods for control of pests, plant diseases and weeds; elaboration of effective measures on safe use of plant protection chemicals; official control of observation rules on use and treatment of pesticides; regulation of import and distribution of pesticides; observation of rules on burying and utilization of forbidden and unserviceable pesticides and their containers in pesticides burial places; checking of pesticides' quality and their correspondence to the state standards and technical requirements.

Ministry gives documents on permission or prohibition of pesticides use and controls their direct and indirect effects on the environment: emissions of chemical substances to the air, water and soil; giving licenses to the state and commercial organizations for use of nature resources with specification of emission and storing of wastes in special places; conducting of state ecological expertise in economical objects; assessment of effects on environment; control of implementation of RT commitments on international agreements; establishment collaboration with international partners in sphere of environment protection.

Ministry of Economical Development and Trade and its agencies elaborate the short-term and long-tern prognoses of socio-economical development of country, environmental conditions, including use of nature resources in republic. Ministry conducts analysis of observation existing legislation, elaborates recommendations on its improvements and submits them to the Government of RT; coordinates activities of appropriate ministries and agencies in sphere of capital investments for development of environmental measures.

Ministry of Health and its agencies control the long-term and short-term effects of chemical substances on human health; realize the state sanitary-epidemiological control; conduct measures on ecological safety, environment protection and sanitary protection of Tajik territory;

elaborate and approve the republican and local sanitary norms, rules and hygienic standards for prevention and elimination of contamination of water reservoirs, water of which is used for drinking, domestic and other needs. Ministry controls the issues on labor hygiene, quality of foodstuff; conducts scientific researches in sphere of influence of ecological and industrial factors on public health, and in particular, increasing of women's status and decreasing of children's mortality.

Ministry of Energy and Industry controls the production of the chemicals and process of introduction of more clean technologies.

Ministry of Melioration and Water Use realizes the preparation and keeping of State Cadastre (surface waters) and Melioration Cadastre. It realizes monitoring of water resources jointly with other specially authorized state agencies.

Ministry of Justice realizes elaboration and introduction of laws and sub-law acts; assurance of providing population with appropriate information and observation of confidentiality of business-information.

Ministry of Finances is responsible for financial support of industry, agriculture and implementation of environmental policy.

Customs Service within Government of the Republic of Tajikistan is responsible for observation of customs-tariff regulations, prohibitions and limits, prescribed by legislation of RT in external economical activity, which is connected with traffic of commodities, including chemicals; and also for conducting of expertise and identification of commodities in accordance with Commodities Nomenclature on External Economical Activity.

Ministry of Transport and Communications controls the safety of transportation and storage of chemicals during the phase of their distribution.

Ministry of Foreign Affairs is responsible for coordination of all international aspects in sphere of chemicals' management in accordance with international agreements and conventions.

Ministry of Labor and Social Protection of Population realizes the control in sphere of professional diseases and observation of safety measures concerning treatment of chemicals on the working places.

State Statistics Committee elaborates and publishes the statistical data on nature resources use and environmental condition: water, land, ambient air, and also implements the functions of chairman in the Inter-Agency Coordination Committee on Ecological Statistics.

Head Department of Geology within Government of the Republic of Tajikistan realizes control of use and protection of underground water from contamination and exhaustion; prepares agreements on building of storage facilities for collection of wastes of chemical and industrial enterprises, including burial places for fluid industrial wastes.

Local authorities consist of representative and executive bodies, which undertake local practical measures on environment protection. They assure the implementation of Constitution, Laws, Statements of Majlisi Milli and Majlisi Namoyandagon of Majlisi Oli, Orders and Decrees of President and Governmental Statements of RT.

Some functions on coordination in sphere of improvement mechanisms on control and regulations of chemical substances use and environment protection are implemented by inter-agency committees:

Inter-Agency Committee on Chemical safety analyses the issues and prepares suggestions for the Republican Government on solution of strategic problems in sphere of chemical safety; observation of requirements and improvement of mechanisms on treatment of chemical substances and biological preparations; observation of normative and legislative acts on chemical safety. This Committee has a right to approve "The List of Chemical Substances and Biological Preparations, permitted for use in the Republic of Tajikistan" and insertion of changes and additions to it.

Inter-Agency Coordination Committee on Ecological Statistics is responsible for implementation of unique state strategy and controlling of ecological statistics, elaboration of methods for monitoring of ecological statistics, coordination of elaboration criteria and evaluation of statistic ecological indicators, characterizing the ecological condition.

The existing organizational structure, including state environmental bodies, should be improved, because it is cumbersome and not very effective. Duplications of activity and exceeding of administration take place in various levels of management. As a result, there is lack of complex ecological policy in sphere of regulation of hazardous chemicals, including POPs.

POPs problem concerns many spheres of state activities, including legislation, protection of public health and environment; management of agriculture, industry, regulation of wastes and interests of various strata of society. For elaboration of effective NIP and its consequent implementation, the participation of all interested

ministries, agencies and public community is of a great importance. There is no in Tajikistan any unique body on management of chemical substances, including POPs-containing ones. The role and responsibility of governmental structures in sphere of chemicals regulation, in accordance with their prescribed powers, are presented in Table 2.2.2.1.

Table 2.2.2.1. Role of governmental structures in the Republic of Tajikistan in solution of problems, connected with management of POPs life cycle

Stage of life cycle / Governmental structure	Production	Export	Import	Storage	Transportation	Labeling/ distribution	Use/treatment	Removal to wastes	Elimination
Agriculture and environment protection									
Ministry of Agriculture and Environment Protection	+ *		+	+	+	+	+	+	+
Department of Plant Cultivation	**								
State Veterinary Service	**		+	+	+	+	+	+	+
Department on Plant Protection and Chemicalixation of Agriculture			+	+	+	+	+	+	+
Department on Nature Resources Use and Environment Protection				+	+	+	+	+	+
Service on State Control on Nature Resources Use and Environment Protection	*			+	+	+	+	+	+
Health care									
Ministry of Health	*		+	+	+	+	+	+	+
Republican Center on State Sanitary-Epidemiological Control				+	+	+	+	+	+
Tajik Scientific Research on Preventive Medicine				+	+		+		
Republican Center on Tropical Diseases Control			+	+	+	+	+		
Labor protection									
Ministry of Labor and Social Protection of Population					+		+	+	
Economy and trade; Finances									
Ministry of Economical Development and Trade	*	+	+			+			
Ministry of Finances					+	+		+	+
Industry									
Ministry of Energy and Industry	+***	+	+	+	+	+	+	+	+
Ministry of Transport and Communications					+		+	+	
Education and science									
Academy of Sciences									+
Abu Ali ibn Sino Tajik State Medical University							+		
Justice									
Ministry of Justice		+	+	+	+	+	+	+	+
Customs									
Customs Service within Government of the Republic of Tajikistan		+	+		+	+	+		
External Affairs									
Ministry of Foreign Affairs					+	+			+
Standardization									
Agency on Standardization, Metrology, Certification and Trade Inspection within Government of the Republic of Tajikistan				+		+	+	+	+
Statistics									
State Statistics Committee		+	+	+			+		

Notes:
* There is no POPs production in Tajikistan
** POPs emissions from pesticides in process of decomposition
*** Unintentionally produced POPs

Analysis of existing legislation in RT in sphere of chemical substances regulation shows the lack of special legislative and normative-methodical base of POPs treatment. The responsibilities of ministries, agencies and other institutions are based on special normative documents: instruction, standards, technical conditions and etc., which regulate transportation of hazardous loads, collection, storage, use, elimination and burying of harmful chemicals.

The responsibility for management of hazardous chemicals, including POPs, distributed between many ministries and agencies, but lack of effective coordination of their activity lead to discordance in decision making in sphere of hazardous chemicals regulation and, consequently, to non-implementation of unique state policy on protection of environment from these substances.

For liquidation of such situation it is necessary to accept the Law on POPs. It will allow elaborating of Protocol on differentiation of responsibilities on hazardous chemicals management between involved ministries and agencies.

Ministry of Agriculture and Environment Protection is made the main responsible body for elaboration of environmental programs / projects and coordination of activities on their realization; it should control the process of implementation of Stockholm Convention in Tajikistan, including:

- coordination of POPs policies and strategies;
- elaboration of principles on management of POPs-containing wastes;
- realization of activities on reduction of POPs contamination of various environmental components;
- elaboration of quality standards on assessment of environmental conditions;
- coordination of activities on BAP and BET implementation;
- control of realization projects with internal and external investments.

2.2.3. Corresponding international agreements and commitments.

The Republic of Tajikistan became the UN member in March 1992 before the UN Conference on Environment and Development in Rio-de-Janeiro (Brazil), where were determined the principles of sustainable development for policy of collaboration and partnership in international relations.

The Republic of Tajikistan, on the base of global partnership, uses international collaboration for effective conducting of state ecological policy and takes active part in international, regional and bilateral cooperation in sphere of environment protection.

Tajikistan established collaboration with several UN agencies and, in particular, with UN European Economical Committee, FAO, Economical and Social Commission for Asia and Pacific Countries, UNEP, UNDP and GEF; with international financial institutions: WB, IMF, European Reconstruction and Development Bank, ADB and IDB, Saudi and Kuwait Funds, and etc. Also, RT establishes environmental collaboration with Afghanistan, China, Iran, Japan, Armenia, Russia and Central Asian countries. RT is the member of several regional and sub-regional organizations, including Organization on Economical Cooperation, Shanghai Organization on Cooperation, Euro-Asian Economical Cooperation, International Fund on Aral Sea Rescue, International Commission on Coordination of Water Issues and Intergovernmental Committee on sustainable Development.

RT recognizes the priorities of international rights principles and assures the correspondence of national legislation to these principles.

Ecological policy of Tajikistan realizes international collaboration by means of:

- improvement of regional and international collaboration in environmental sphere;
- correspondence of republican laws to international legislation;
- elaboration of national programs and introduction of appropriate mechanisms for realization of international conventions;
- implementation of bilateral and multilateral agreements, and also participation in regional programs.

Under the aegis of Intergovernmental Committee on Sustainable development and by support of ADB, UNEP and UNDP was prepared the “Regional Action Plan on Environment Protection for Central Asia”, which includes five ecological priorities and measures for short-term (2002-2007) and long-term (2007-2012) perspective.

Tajikistan jointed to 10 international environmental agreements (insertion 1), and following of them are related to the chemical conventions: Vienna Convention on Ozone Layer Protection, UN Framework Climate Change Convention, Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade and Stockholm Convention on POPs.

INSERTION 1

Stockholm Convention on POPs (2006)

Convention on Long-range Trans-boundary Air Pollution (2004)

Bonn Convention 1979 on the Conservation of Migratory Species of Wild Animals (2001)

Aarhus Convention on Access to Information, Public Participation in decision Making and Access to Justice in Environmental Matters 1998 (2001)

Ramsar Convention (1971) on international water territories, inhabiting by waterfowl (2001)

UN Framework Climate Change Convention (1998)

Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998)

United Nations Convention to Combat Desertification 1994 (1997)

UN Convention 1992 on biological diversity and its Cartagena Protocol 2002 года on biological safety (1997/ 2004)

Vienna Convention (1985) on Ozone Layer Protection and Montreal Protocol on Ozone Depleting and its London Amendment 1990 (1996/1998/1998)

As the addition to international conventions, RT signed several regional agreements:

- Agreement on cooperation in sphere of ecology and environment protection in CIS from 8th February 1992, which includes following: harmonization of environmental legislation and ecological standards; joint elaboration and implementation of international programs and projects in sphere of nature resources use, environment protection and ecological safety, including programs on safe elimination and neutralization of chemical and nuclear weapon, highly toxic and radioactive wastes (Article 3);
- Agreement on informational cooperation in sphere of ecology and environment protection from 11th September 1998, in accordance with which in CIS is realized the information exchange and distribution of ecological information; is created the database on condition of the environment and hazardous and other objects, connected with nature resources use; and presented results on scientific and technical works in sphere of ecology and nature resources (Article 1);
- Agreement on collaboration in sphere of ecological monitoring in CIS from 13th January 1999;
- Memorandum about establishment of cooperation between Government of the Republic of Tajikistan and the Republic of Kyrgyzstan in sphere of ecological safety from 26 May 2004;
- The framework Convention on Environment Protection for Sustainable Development in Central Asia, which was signed in Ashgabat (Turkmenistan) on 22nd November 2006.

For assurance of coordinated policy in sphere of ecology and environment protection in CIS, in May 1993 was created Inter-State Ecological Council (ISEC) for CIS-countries. On the initiative of ISEC and in the framework of "Agreement on collaboration in sphere of ecological monitoring" was prepared the "Inter-State Scientific-Technological Program on Creation and Development System of Ecological Monitoring on the Territory of CIS". For integration of national and regional monitoring systems, forecasting, and modeling of ecological situations for technical, normative-methodical and programming of the above-mentioned systems was established the Inter-State Center on Ecological Monitoring (ISCEM), also, the main directions of Program were prepared for development of ISCEM, In framework of ISCEM should be elaborated the monitoring system on POPs contamination of environment.

In 1998, Tajikistan jointed to the "Agreement between Governments of the Republic of Kazakhstan, Republic of Kyrgyzstan and Republic Uzbekistan about Collaboration in Sphere of Environment Protection and Rational Use of Nature Resources", in accordance with which the Parties realize collaboration in sphere of neutralization, sterilization, safe elimination and burying of toxic and radioactive wastes (Article 2).

The established legislative base assures the full participation of Tajikistan in the process of international collaboration.

2.2.4. Description of existing legislation and regulations concerning POPs (intentionally and unintentionally produced).

Assurance of ecological safety and use of chemical substances, including POPs, is regu-

lated by state legislative acts and normative-methodical documents.

Analysis of existing legislation on POPs treatment showed the lack of special normative base for POPs treatment in Tajikistan. Besides, in sphere of treatment of hazardous chemicals, forbidden pesticides and harmful wastes, the following levels of regulation are visible:

Constitutional norms:

- Accordingly to Article 38 of the Constitution of RT "Every citizen has a right on health protection. The State undertakes measures on enhancement, development of public sports, physical culture and tourism".

LEGISLATIVE ACTS:

- ***Environmental and resource-saving legislation:***

•• Law "About Environment Protection" (2002). In accordance with Article 27 "Norms for use of plants protection preparations in agriculture, forestry and other branches of economy should be determined accordingly to: standards on maximum permissible of chemicals residuals in foodstuff, to health care principles, to genetic fund, and to flora and fauna conservation".

Article 28 of this Law specifies that "Standards of maximum permissible residuals of harmful chemical substances in foodstuff is fixed by determination of minimum permissible doze, harmless for people, on every chemical substance and on every foodstuff".

Article 48 specifies the ecological requirements for use of chemicals in national economy. Accordingly to this Article "use of new chemical substances, which may directly or indirectly influence on human health, should be permitted only by Ministry of Health in Republic Tajikistan. Use of toxic chemicals, which not decay and effect on human health and environment, is forbidden".

•• Le Law "On ecological expertise" (2003) regulates the order on organization and conducting of ecological expertise and fixes responsibilities for breaking legislation in this sphere. The Article 1 of this Law obliged to conduct the ecological expertise before making decisions on all kinds of economical, industrial and other activities for right-time prevention of negative effects on public health and environment. Creation of database on environmental conditions and on results of assessment on ecological effects on peoples and nature (Article 3).

Accordingly to Article 4, the purpose of ecological expertise is analysis and assessment of ecologically harmful objects on public health, nature resources and environment, and also social, economical and ecological consequences.

The objects of ecological expertise (Article 7) are following: technical documentation of new equipment, technologies, materials, substances, certified commodities and services, including imported ones.

•• Law "About atmospheric air protection" (1996, additions and changes were inserted in 2002). In the Article 11 are specified the main requirements to standardization of atmospheric air quality by determination of maximum permissible norms in accordance with international standards, conventions and agreements for assurance of ecological safety of population and environment irrespective economical or other activity.

In accordance with Article 26, the juridical and physical persons are obliged to undertake measures on prevention and liquidation of harmful effects on atmosphere by production, storage, use, transportation of chemical and biological preparations.

•• Law "About wastes of production and consumption" (2002). Accordingly to Article 4 of this Law, the main principle of state policy in sphere of treatment with wastes is the priority of the environmental measures, directed on protection of public life and health.

Accordingly to Article 9, the exploitation of enterprises, producing hazardous wastes, which cannot be destroyed by ecologically safe methods, is forbidden.

In Article 10 of the Law is specified following: the storage of wastes should be realized accordingly to requirements, specified in normative acts; wastes burial places should be inserted to the special state register; the process of wastes burying should be accompanied with monitoring of burying places, which should be conducted by owner of these places and in regime, which is agreed with authorized body in sphere of wastes treatment; the owners of objects on wastes storage should undertake measures on rehabilitation of these objects after completion of their exploitation.

In Article 12 are specified the requirements to treatment of hazardous wastes, in accordance with which all physical and juridical persons, whose activity is connected with production of hazardous wastes, should assure the appropriate protection of environment from their harmful effects; also they should register wastes accordingly to special requirements of State Statistics Agency and authorized body in sphere of wastes management.

In the Article 13 are specified the require-

ments to transportation of hazardous wastes, which is allowed only by availability of passport on these wastes and special equipped transport means. The transport organization, to which belongs this transport means, is legally accountable for safe treatment of hazardous wastes during transportation (loading, registration and unloading in special place).

In the Article 14 is specified the prohibition of import wastes to the republic for burying and sterilization. Control of hazardous wastes import and export is realized by authorized state executive bodies, which are dealing with frontier, customs, ecological and sanitary-quarantine inspection in accordance with existing normative-legislative acts and international agreements, adopted in Tajikistan.

•• Law "About Protection and Use of Flora" (2004). Article 11 of this Law obliges to observe rules of use plants protective preparations, growth regulators and other preparations for decreasing of their harmful effects on flora and environment in whole, taking in account the combination with other agro-technical, selective-genetic, biological and other measures. Accordingly to this Article, by creation and import of new preparations should be elaborated the maximum permissible concentrations of these preparations in environment for protection of wild plants, their eco-systems, including territories of their growth.

•• *Forest Code (1993). The Code regulates the relations for assurance of forests use and protection, for improvement of environment, including:*

- forests protection from diseases and pests (Article 41);
- prevention of contamination forests with chemical and radioactive substances, sewages and wastes (Article43).

•• *Land Code (1996) regulates the lands relations and is directed on creation of conditions for rational use and protection of lands, rehabilitation of soils fertility, conservation and improvement of environment in whole, including:*

- protection of land from contamination with industrial wastes, chemical and radioactive substances (Article 52);
- conducting of lands monitoring (Article 63).

•• *Water Code (2000) regulates the water relations, including protection of waters from contamination and exhaustion, in particular:*

- in water-protective zones is forbidden to use chemical substances, to establish enterprises, which may negatively effect on their condition (Article 22);
- undertaking measures on complete stopping of emissions contamination substances to the water reservoirs (Article 45);
- conducting of sanitary-technical sterilization of sewages and sanitary protection and improvement condition of coastal territories (Article 121);
- prohibition of emission industrial, municipal and other wastes (excluding Articles 98-101) to water reservoirs (Article 123).

• ***Legislation in sphere of public health care:***

•• Law "About Public Health Care" (1997). Public health care in RT is realized by following means:

- observation of human rights in sphere of health protection accordingly to normative-legislative acts of RT (Article 3);
- undertaking measures on enhancement of environment and assurance of ecological and radioactive safety, nature protection in accordance with legislation of RT (Article 3, 4);
- state guarantee of conservation favorable environment, which has not negative influences for health of present and future generations (Article 23);
- assurance of ecological, sanitary-epidemiological and radioactive safety for population of RT (Article49).

Accordingly to Article 27, every citizen has a right for receiving information from official bodies, health care institutions and juridical persons concerning factors, which can effect human health, environment, labor conditions, living standards and rest.

•• The Law "About Sanitary-epidemiological Safety of Population" (2003). Accordingly to the Article 3 of this Law, the sanitary-epidemiological safety of population is assured by following:

- elaboration and realization of national and regional programs, including enhancement of environment and increasing of living standards;
- state sanitary-epidemiological standardization;
- certification of industrial commodities, works and services, which are potentially harmful for public life and health; making sanitary-epidemiological conclusions for them;
- state registration of existing and newly imported to RT chemical and biological substances, products, wastes of production and consumptions, which are potentially harmful for peoples.

Article 13 obliges to permit for produce, transport, purchase, storage, sale and use of

potentially harmful chemicals only after state registration.

•• Law "About Quality and Safety of Foodstuff" (2002). The Article 15 of this Law specifies that realized foodstuff should correspond to requirements in sphere of organoleptic and physicochemical indicators; and also correspond to fixed normative documentation on maximum permissible concentration of chemical substances (including radioactive ones), biological substances, including their combinations, and other biological organisms, which are harmful for human health.

Accordingly to Article 17 it is not permissible to use by production of children's food any raw materials, prepared by use of forage admixtures, growth promotion factors for animals (including hormonal preparations), certain medicines, pesticides and other harmful for human health substances and combinations.

- ***Legislation in sphere of industrial safety, production and handling:***

•• Law "About Safety in Hazardous Industrial Enterprises" (2004)

Accordingly to Article 4, the requirements of industrial safety should correspond to the norms on protection public health and territories from extraordinary situations, on assurance of sanitary-epidemiological well-being of population, environment protection, ecological safety, fire safety, labor protection and state standards.

- Normative-legislative acts, assuring implementation of legislative policy and accepted international agreements (Annex A 6).

- ***Anti-criminal and administrative mechanisms:***

•• *Criminal Code (1998),* Article 223 of Criminal Code specifies that there is criminal responsibility for breaking rules on safety by production, transportation, storage, burying, use and any kinds of treatment with radioactive, bacteriological, chemical substances and wastes, if it was the reason of threat for human health and environment.

Accordingly to Article 228 of the Criminal Code, the criminal penalty is realized in case of land contamination with hazardous productions of economical and other activities as a result of breaking rules on appropriate use of pesticides, fertilizers, stimulators of plants growth or other harmful chemical and biological substances during their storage, use, transportation; and also in case of spoiling soils with negative consequences for human health and environment.

•• *Code of RT "About Administrative Infringements" (1998)*. Administrative penalty, accordingly to Article 85, is realized in case of infringement rules on storage of industrial and municipal wastes and also for breaking rules on their combustion.

Accordingly to Articles 86 and 88, administrative penalty is realized in case of breaking rules on transportation, storage and use of plants protection preparations and other substances, leading to contamination of atmosphere and damaging fauna.

2.2.5. Condition of legislation and normative-methodical base in sphere of treatment POPs-containing pesticides and wastes.

In majority of developed countries, the effective legislative instruments for regulation of POPs-containing wastes are elaborated and introduced.

The legislative aspects are of a great importance for planning of all activities on the state level. Presently, the problems on wastes management, including toxic ones, are indicated in national priorities on environment protection in RT. No one Law of RT contradicts to the requirements of Stockholm Convention in sphere of wastes management. However, there no special records in existing legislative and normative-methodic base of republic about POPs-containing wastes (obsolete and forbidden pesticides, PCBs and PCB-containing equipment), especially it concerns the Law "About Nature Protection", "About Wastes of Production and Consumption", "About Assurance of Sanitary-epidemiological Safety of Population" and "About Production and safe Use of Pesticides and Agro-chemicals".

The Law "About Wastes of Production and Consumption", accepted in 2002, regulates the relations in sphere of formation, collection, storage, use, transportation, sterilization and burying of wastes, and also in sphere of state management and control of wastes treatment. The Law is intended for prevention of negative effects of production and consumption wastes on environment and human health during their treatment and also for prevention of their use in economical/industrial turnover as the additional source of raw materials. The Law specifies the definition of hazardous wastes: the wastes containing substances with whatsoever harmful properties – toxicity, infection, explosive risk, inflammability, reactivity and/or other similar properties. The Law, in particular, obliges: physical and juridical persons, whose activity is connected with formation of hazardous wastes, should assure the protection of

environment and population from their harmful effects; storing of hazardous wastes should be realized only specially equipped storage facilities after receiving of special permissions.

The policy on hazardous wastes treatment in trans-border context is presented in the Law "About External Economical Activity", which obliges the subjects of external economical activity to observe legislation of Tajikistan and international norms and rules. Trans-border management in sphere of hazardous wastes treatment is specified in the Law "About State Regulation of External Trade", which obliges to observe the standards and criteria of safety for people during import of commodities (including hazardous wastes) and the rules on their control all over the country.

However, the majority of laws are only declarative and not supported by normative-methodic base and other efficient mechanisms of their implementation; and it decreases significantly the real capacity for management of wastes, including POPs-containing ones. Analysis of normative-methodical base in sphere of safe handling with hazardous wastes confirms the lack of state system on management of POPs, including components of their life cycle, in Tajikistan.

Presently, there is no in republic any purposive work on elaboration and introduction of modern national system on classification of wastes, including POPs-containing ones (pesticides and PCBs). In Tajikistan is still not elaborated the national classifier on wastes toxicity, which should include the POPs-containing wastes. On this reason, in Tajikistan there is no any state statistic system of reporting for wastes and, consequently, no data on annual formation of wastes, types of wastes, their location, use and sterilization. The existing information is scanty, it may be found in various agencies, and it is not accessible for public community.

Due to lack of financial and technical means, during all period of independency, in Tajikistan was not conducted the comprehensive inventory of wastes, was not prepared the state register, which should include the catalogue of wastes, the results of inventory of wastes and their locations, and also the database on technologies of their use and sterilization. There are no exact data on pesticides use due to lack of appropriate control of their delivery and consumption. Practically, there is no information on number of obsolete and forbidden pesticides, on places of their location (storage facilities) and condition of burial places. For receiving of these data it is necessary to conduct inventory of wastes, including pesticides, on regular base.

Analysis of legislation revealed another legal problem in this sphere: there is no in Tajikistan any special regulation concerning decommission and elimination of PCB-containing electrotechnical equipment. There are no special legal acts concerning registration of PCB-containing equipment, inventory of used and decommissioned equipment, organization of ecologically safe storing PCB-containing electro-technical equipment till making decision on its elimination/utilization. There is no assessment of environmental components contamination in places of exploitation and storage of this equipment. There are no in republic any legal provisions on utilization of contaminated soils and PCB-containing equipment, requirements and standards for special storage facilities for PCB-containing equipment and wastes.

Nowadays, the existing normative-methodic base for identification of wastes is not effective for implementation of Stockholm Convention on POPs; it needs in reformation in accordance with international requirements. Its improvement and concordance with requirements of Convention and national demands is one of the main national priorities.

The principle law in sphere pesticides management is Law "About production and safe use of pesticides and agrochemicals" (2003). The Law specifies the legal principles of production and safe handling with pesticides and agrochemicals for protection of human health and environment.

In the Article 2 is presented the definition of "state registration of pesticides and agrochemicals", on the base of which the special authorized state body realized state registration by conducting of laboratory and field researches, gives the permission for production, use, sale, transportation, destruction, advertisement, import and export of pesticides and agrochemicals.

Accordingly to Article 12, pesticides and agrochemicals, permitted for use in Tajikistan, are inserted to the State Catalogue of Pesticides and Agrochemicals, which issued by special authorized state body responsible for conducting of researches and registration of pesticides and agrochemicals.

Accordingly to the Article 17, by realization of pesticides and agrochemicals the seller (supplier) is obliged to provide every unit of pesticides container with instructions on their use, transportation, storage and label.

Physical and juridical persons have a right to purchase and sale only those pesticides and agrochemicals, which are registered and inserted into State Catalogue of Pesticides and Agrochemicals, permitted for use on the territory of Tajikistan (Article 23).

In the Article 26 of the Law is specified the responsibility for violation of Tajikistan's legislation in sphere of production and safe treatment with pesticides and agrochemicals.

The main legal aspects on treatment with pesticides are more or less regulated by rules, instructions, methodical guidance, standards and recommendations:

- *"Sanitary rules of storage, transportation and use of pesticides (pesticides in agriculture)"* regulates the conditions on pesticides use in agriculture for prevention of poisoning of peoples dealing with pesticides during the working process (transportation, storage, treatment of plants, animals, poultries, premises, care of treated crops and etc.), prevention of contamination foodstuff, ambient air, settlements, water reservoirs and soils with pesticides;
- "Instruction of safety measures by storage, transportation and use of pesticides in agriculture" *specifies the requirements for assurance of safe use of pesticides in agriculture, industrial safety, fire-protection and environment protection during storage, transportation and use of chemicals for plants protection;*
- *"Instruction on preparation and burying of forbidden and unserviceable pesticides and their containers"* specifies the order of collection and preparation for burying of unserviceable and forbidden for use both solid and powdery pesticides and their containers;
- *"Methodical recommendations for sanitary-epidemiological services on sanitary protection of water-reservoirs from contamination with pesticides after their use in agriculture"* - methodical recommendations are intended for control and conducting of measures on sanitary protection of water-reservoirs from contamination with pesticides after their use in agriculture. In methodical recommendations is presented the list of maximum permissible concentrations of pesticides in water-reservoirs, the water of which is used for covering of sanitary-domestic demands;
- *State Standard (ГОСТ 14189-81) "Pesticides: rules of reception, taking of samples, packaging, labeling, transportation and storage"* determines the rules of reception, taking of samples, packaging, labeling, transportation and storage of pesticides;
- Recommendations of UN Food and Agricultural Organization (FAO) in Tajikistan on protection of agricultural crops from pests and diseases, Dushanbe – 2005, p. 69.
- *and etc.*

2.3 ASSESSMENT OF POPS PROBLEM IN THE COUNTRY.

2.3.1. Evaluation of chemical substances in accordance with Annex A Part I (POPs-containing pesticides): production, use, import and export in past, present and planned future. Short review of existing monitoring data (environment, foodstuff, human organism) and effects on health.

The Convention specifies: prohibition of import and export of all pesticides, listed in Annex A, accepting purposes of ecologically safe elimination and exemptions.

In the Article 3 and Annex A, Part I of the Convention is specified the following:

- complete prohibition of aldrin, dieldrin, endrin, heptachlor and toxaphene production;
- as the exemption may be permitted the production of chlordane, hexachlorobenzene and mirex;
- aldrin, chlordane, dieldrin, heptachlor, hexachlorobenzene and mirex may be included to the register of use for certain exemptions.

Use, import and export in past, present and planned future. Pesticides, including organochloric and POPs-containing ones delivered to Tajikistan in 80-90th years of former century from other countries on centralized base via Republican Industrial Scientific Organization "Tajikselhozhimia" (till 1980 – "Tajikselhoztehnika") with full responsibility for appropriate storage, effective use and reliable registration. Nowadays, POPs-containing pesticides are not imported and not re-exported. Use of some POPs-pesticides in agriculture in forbidden: DDT since 1970; aldrin – since 1973; dieldrin and chlordane since 1985; and heptachlor since 1992.

From 1965 to 1990, the volume of pesticides delivery to Tajikistan was from 7 to 14 thousand tons (in calculation on 100% of reactant). During this time the volumes of pesticides use changed significantly in accordance with their groups. So, the volume of insecticide-acaricides decreased from 11,1 thousand tons to 1,7 thousand tons, but use of fungicides increased from 1,0 thousand times to 6,1 thousand times, many fold increased the use of herbicides and defoliants (Diagram 2.3.1.1).

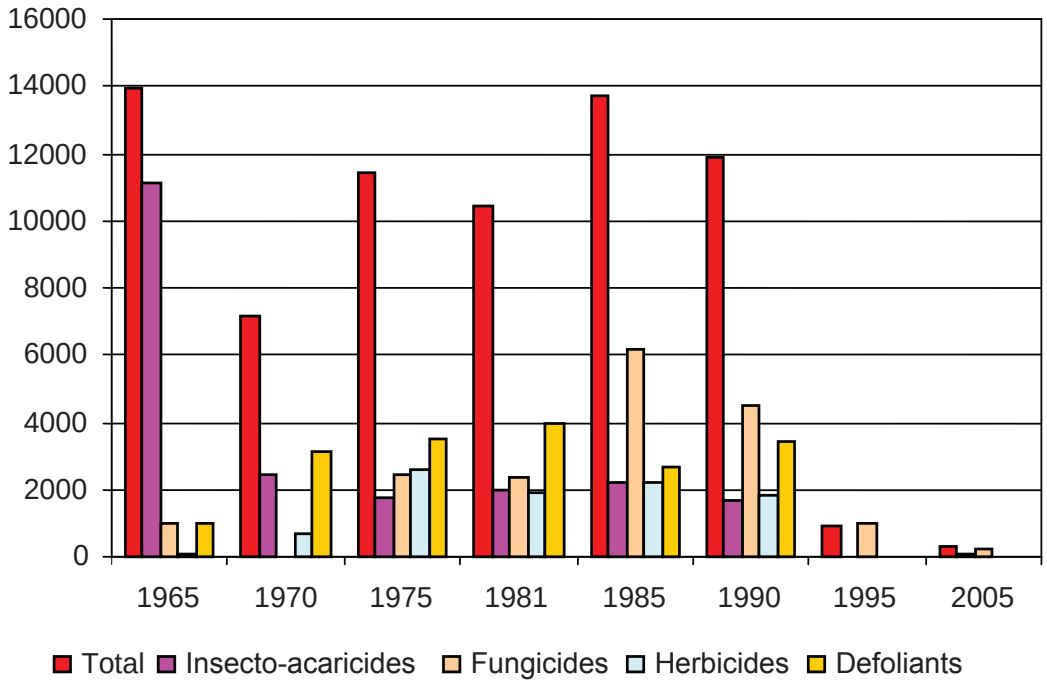


Diagram 2.3.1.1 Pesticides delivery for agriculture of the Republic of Tajikistan (tons in calculation on 100% of reactant).

Decrease of insecticide-acaricides consumption is stipulated by decrease of organochloric pesticides use; in the middle of 90th years their import to Tajikistan was stopped (Diagram 2.3.1.2).

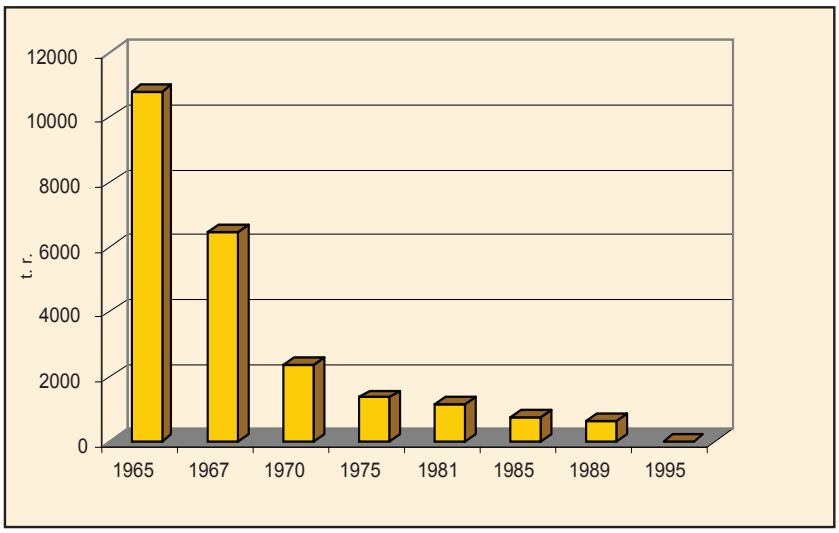


Diagram 2.3.1.2 Dynamics of organochloric pesticides consumption (tons in calculation on 100% of reactant)

The assortment of used pesticides included chemicals, which later were considered among POPs-containing ones: aldrin, dieldrin, heptachlor, endrin, hexachlorobenzene, toxaphene and DDT. Mainly was used DDT in various concentrations, which annual consumption from 1960 to 1970 for cotton-growing was 8,7 thousand tons (in preparative form). Also, DDT was used widely in other agricultural sectors, including vegetable-growing.

The highest level of pesticides consumption was in 1967: from 45,3 thousand tons of various pesticides were used 32,1 tons. The volume of DDT consumption in this year was 8,6 thousand tons or 33% from total volume of insecticide-acaricides, which used for agricultural pest combat. HCH consumption in 1967 was 10,7 thousand tons. In 60th years, the average pesticides consumption, including insecticide-acaricides, was in republic 16,7 and 13,4 correspondingly per 1 ha of arable land and perennial plants (Table 2.3.1.1).

Pesticides	Years					
	1965	1970	1975	1981	1985	1990
TOTAL:	16,753	8,550	13,542	12,176	15,533	13,097
Including:						
insecticide-acaricides	13,435	2,930	2,093	2,340	2,486	1,857
fungicides	1,116	-	2,891	2,754	6,968	4,990
protectant	0,058	0,040	0,044	0,105	0,477	0,276
herbicide	0,126	0,796	3,046	2,226	2,504	1,995
defoliants and desiccants	1,194	3,757	4,162	4,634	3,028	3,813
other	0,824	1,027	1,306	0,117	0,070	0,166

Table 2.3.1.1. Pesticides delivery per 1 ha of arable land and perennial plants (kg of reactant)

Pesticides were used predominantly on cotton-growing fields, the average repetition factor was in republic 6 – 10 times, and in certain districts of Hatlon region it was much higher – till 17 times.

The agricultural aviation was widely used for chemical treatment of arable lands; the share of aviation in realization of such measures was about 86%. As a result, in densely populated, irrigated territories of republic was the intensive process of accumulation various plant protection chemicals in environmental components (soils, water, silt, plants and etc). It was a fact of a great concern; and in republic were undertaken measures on decreasing of pesticides consumption, and in particular: was introduced the integrated system for combating pests of agricultural plants on the base of combined use of all plant protection measures – agrotechnical, biological and chemical ones.

After 1991, the pesticides consumption decreased sharply on various reasons (breaking of economical relations, lack of finances in economy and so on). During 15 years, the delivery of pesticides to the republic was about 21 thousand tons. In 2003, accordingly to Customs Service data, the import of pesticides was 135 tons. The factual volume of chemical treatment of crops testifies that pesticides were used much wider. Delivery of pesticides is realized by various firms and private persons, so there are cases of illegal import of obsolete and forbidden pesticides. In 2005 – 2006, Customs Department within Ministry on State Incomes and Taxes of the Republic of Tajikistan revealed and prevented illegal realization of 17 tons of DDT, delivered from neighboring country.

In nearest time, the pesticides consumption will be presented in numbers, necessary for implementation of integrated system on protection of agricultural plants from pests and diseases. Accordingly to data of State Agency on Plant Protection and Chemicalixation within Ministry of Agriculture and Environment Protection, the demand in pesticides for agriculture in 2007 – 2011 is about 15 thousand tons per year.

Results of inventory. Nowadays, the available obsolete and forbidden pesticides are of a great concern for human health and environment. During the Soviet period, delivery of pesticides was realized in accordance with requests of firms, and their import to republic often exceeded the factual demand in 1,5 – 2 times. As a result, it was observed the accumulation of big volumes of pesticides residuals in storage facilities and Republican Productive Scientific Organization “Tajikselhozhimia”. Also, following factors contributed to the abovementioned problem:

- health care agencies issued the prohibition for use of formerly purchased preparations due to increased toxicological and ecological risk;
- inefficiency of chemicals in sphere of their application;
- termination of pesticides keeping time during long storing;
- unpractical size and quality of containers; breaking of packages due to their ageing;
- unsuitable preparative form;
- low stability of preparations during their storage;
- inefficient organization of storage and registration.

Due to availability of significant volumes of pesticides storages, the facts of their uncontrolled use took place: pesticides were given to private persons for their use in their farm-lands; also, the pesticides were secretly buried and thrown to the dumps. During last years, due to sharp decreasing of pesticides import to republic, their residuals, including forbidden and obsolete pesticides, were used in farm-lands.

As a result of conducted initial inventory were revealed 17,55 tons of DDT, including 17 tons of illegally imported in 2005 – 2006 to Sugd re-

gion. Other 0,55 tons are in two households of Gissarski district. In storage facilities, in packaging, destroyed due to long keeping, were revealed 42,1 tons of unfit known pesticides and 100 tons of unknown pesticides, in composition of which only DDT and its metabolites have the POPs properties. Thus, the volume of forbidden, obsolete and unknown pesticides, which should be repackaged and eliminated, is 160,1 tons. In case of detailed inventory all over republic, this figure may increase in two or more times. Moreover, there are mixtures of unknown pesticides with soil, mineral fertilizers and garbage in approximate amount of 4,5 thousand tons (Diagram 2.3.1.3 without volume of pesticides, buried in special pesticides burial places).

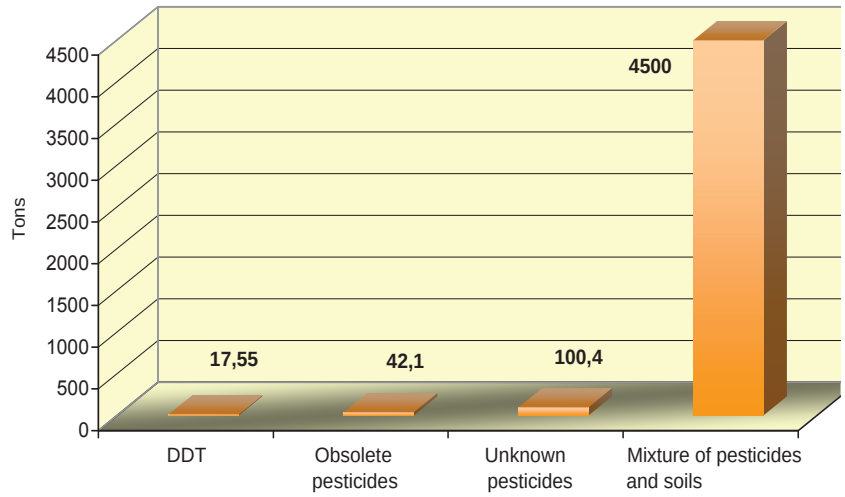


Diagram 2.3.1.3 Volume of unfit (forbidden and obsolete) pesticides and their unknown mixtures, revealed during initial inventory in storage facilities and agricultural air-fields

Total number of obsolete and forbidden pesticides, including their mixtures with soils and buried in special pesticides burial places, revealed during initial inventory is 15160,1 tons (Diagram 2.3.1.4).

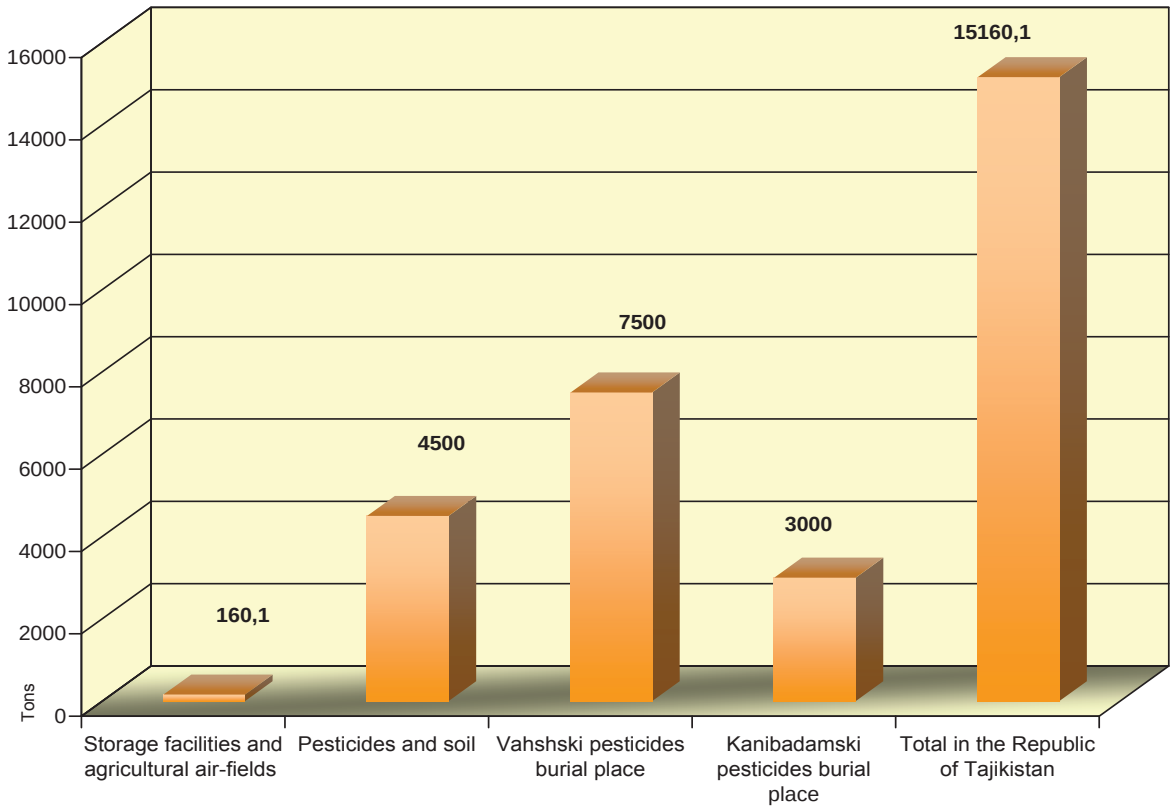
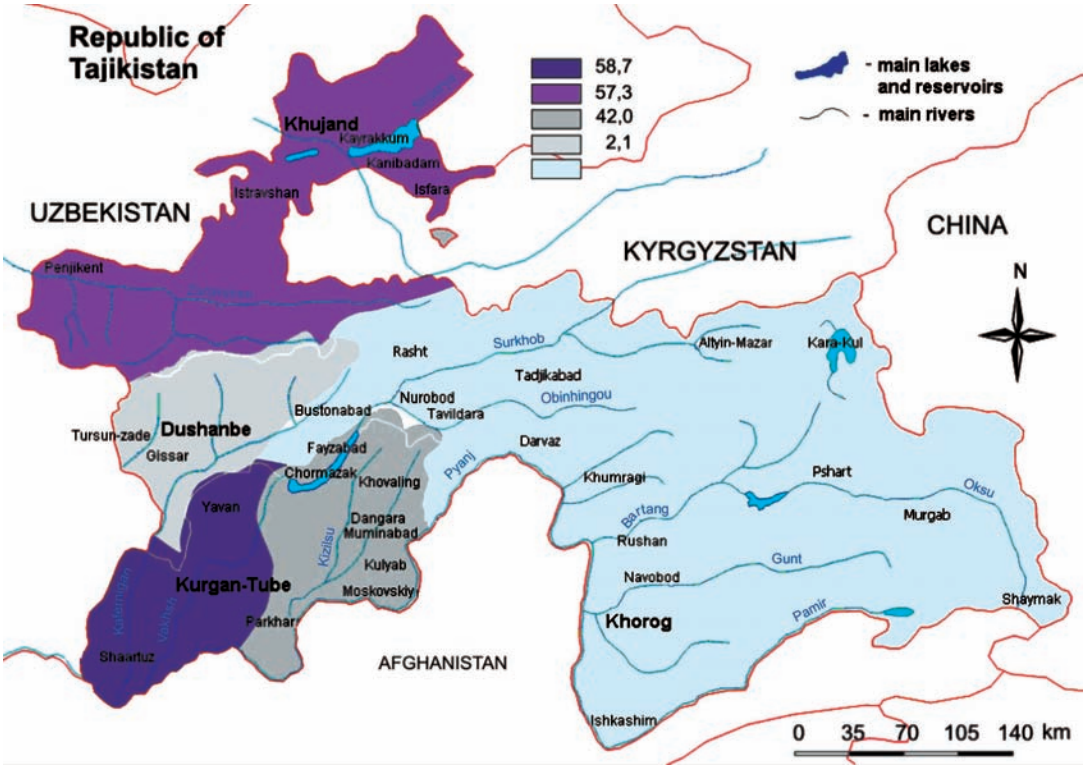


Diagram 2.3.1.4 Number of unfit (forbidden and obsolete) pesticides and their mixtures with soils in examined objects

Location of revealed during initial inventory obsolete and forbidden pesticides, including POPs-containing ones, and their unknown mixtures all over regions of Tajikistan confirms the potential threat for human health and environment (Map 2.3.1.1).



Map 2.3.1.1 Location of revealed during initial inventory obsolete and forbidden pesticides, including POPs-containing ones (information on 01.07.2006).

Map 2.3.1.2 Location of pesticides mixture, including POPs-containing ones, with soil, mineral fertilizers and garbage (information on 01.07.2006)

The situation is aggravated by availability of pesticides mixtures with soils, mineral fertilizers and garbage in storage facilities, places for solution preparations and adjoining territories (Map 2.3.1.2). For determination of real volume of such mixtures it is necessary to organize special works. In samples of pesticides mixtures with soils was revealed following: mainly - DDT and its metabolites, and in small quantities – aldrin, dieldrin, endrin, HCB and heptachlor (analysis was done by Bashkir Republican Scientific Research Ecological Center, Ufa city). All above-mentioned confirms that in former time POPs-related pesticides were used in Tajikistan.

Simultaneously with pesticides inventory were examined their storage facilities. These storage facilities were intended only for pesticides storing, and keeping there any other productions or incompatible pesticides groups are strongly prohibited. Inventory covered 167 storage facilities from 372 functioned till 1990; where following facts were revealed:

- all standard storage facilities of former Republican Productive Scientific Organization "Tajikselhozhimia" are privatized; part of them is completely destroyed for use of materials for building of new houses and economical objects;
- almost all existing storage facilities of former collective farms are tumbledown; many of them haven't roofs and windows, their roofs are broken (photo 2.3.1.1);
- often, these storage facilities haven't any fencing and guarding; the access of population and domestic animals is free;
- some of storage facilities are located near settlements and economical objects, near water sources, agricultural fields and gardens;
- some storage facilities are uses for storing of forage, various building materials and household equipment. There are some cases of use storage facilities as living quarters.

Photo 2.3.1.1 Pesticides storage facility.

In examined storage facilities there are more than 236,9 tons of pesticides, including 160,1 tons of unfit for use preparations and their mixtures (photo 2.3.1.2, 2.3.1.3). It is a great problem and dangerous ecological situation.

Photo 2.3.1.2 «Storage» of obsolete pesticides in storage facility.

Photo: GEF/UNEP Project

The special threat is the availability of unknown chemical preparations, keeping open-air near the storage facilities, neglected places for pesticides solutions preparation, in places of numerous digging out of chemicals in pesticides burial places. There, they are exposed to precipitations and wind, which transfers them to the remote distances.

Photo 2.3.1.3 Mixtures of unknown pesticides in the storage facility

Agricultural air-fields. The main source of negative effects on environment and population have former agricultural air-fields. Till 1980, in collective farms of republic functioned altogether 40 air-fields, which include pesticides storage facilities, water-pits, containers for preparation of process solutions and loading mechanisms. Nowadays, no one of the air-fields is functioning; many of them are completely liquidated (photo 2.3.1.4). From 37 of examined air-fields, were revealed 13 partly preserved airfield with hard coating.

a)

b)

Photo 2.3.1.4 Destroyed pesticides storage facility (a) and place for preparation of pesticides solutions (b) within agricultural air-field

Practically all agricultural air-fields with ground lining and majority of constant air-fields (with hard coating) are used for growing of various agricultural plants; also the pasturing of domestic animals is sometimes observed. All storage facilities within agricultural air-fields are destroyed. Building materials, pesticides remainders and empty containers are taken out by population.

Availability of empty pesticides containers.

Photo: GEF/UNEP Project

The serious attention should be paid to the empty pesticides containers, because they pose a great threat for human health and environment. During the period of intensive use of pesticides, there were a lot of empty containers; however, only their small part – predominantly in unfit condition, was returned to the storage facilities. Sending containers to the pesticides producing factories was not organized appropriately due to expensiveness of transportation. At the same time, the empty containers were transported from storage facilities to the pesticides burial places, where were buried altogether 50 thousand units, including 33 thousands in Vahshski and 17 thousands in Kanibadamski burial places. Mainly, it was metal and plastic containers.

Presently, only in certain storage facilities may be found the insignificant number of pesticides containers in unsatisfactory condition. Containers in proper condition, mainly plastic 5 – 10 liters containers, are widely used by population for keeping of drinking water, oils, flour and other foodstuff and things. Unfit containers are thrown away to the dumps of solid municipal wastes and various pits. By use of empty pesticides containers for domestic purposes were observed the cases of peoples and animals poisoning.

In accordance with existing information, nowadays, population uses about 40 thousands containers, 80% of which are the plastic containers.

In republic, there is the quick accumulation of plastic containers, but due to chemical stability of their materials, they shouldn't be buried in pesticides burial places; and they shouldn't be burned due to uncontrolled emissions of hazardous incineration products to the ambient air.

Pesticides burial places. For prevention of negative effects of disabled pesticides on peoples and environment, the Government of Tajik SSR accepted the Statement No. 104 from 13th March 1970 about allocation of land plots and building of Vahshski and Kanibadamski for burying and destruction of pesticides.

Vahshski pesticides burial place is located in Hatlon region, in south-western direction from regional center. Territory of burial place is about 12 ha. The distance from it to Vahsh settlement is about 30 km, in 17 km there is Vahshski irrigation channel; the distance to the nearest settlement Ak-Gaza is about 8 km. Vahshski burial place receives for burying the obsolete and forbidden pesticides from economical objects of Hatlon region, GBAO and RRS.

Kanibadamski burial place is located in Sugd region in south-eastern direction in 7 km from Kanibadam city. Territory of burial place is about 2 ha. The territory of burial place is located hypsometrically – 275 m higher of Kanibadam city with inclination of relief to the city, where there are two arterial channels and seven wells of various purposes. Kanibadamski burial place received forbidden and obsolete pesticides from economical objects of Sugd region, and also from frontier districts of Uzbekistan and Kyrgyzstan.

Before choosing of land plot for Kanibadamski burial place no any engineering-technical, hydro-technical and sanitary-ecological researches were conducted. No the same materials on any investigations were found concerning Vahshski burial place.

Certain researches were conducted in Kanibadamski burial place only in 1990. As a result, As a result was revealed that this plot, from geological point of view, contains mud-stone stream sediments with pebbles, boulders and gravel. Such layer is characterized by high penetrability for precipitations with components of various substances, including pesticides. The bottom and sides of trenches are not isolated. That is why, they are potentially dangerous for the environment.

Pesticides were buried and sometimes burned here. During 1973 – 1991, in Vahshski burial place were buried about 7500 tons of various pesticides, including about 3000 tons of DDT; in Kanibadamski burial place - 3000 tons, including 30 tons of polidofen (20% of DDT + 40% of toxaphene), 100 of DDT and 4000 tons of HCH.

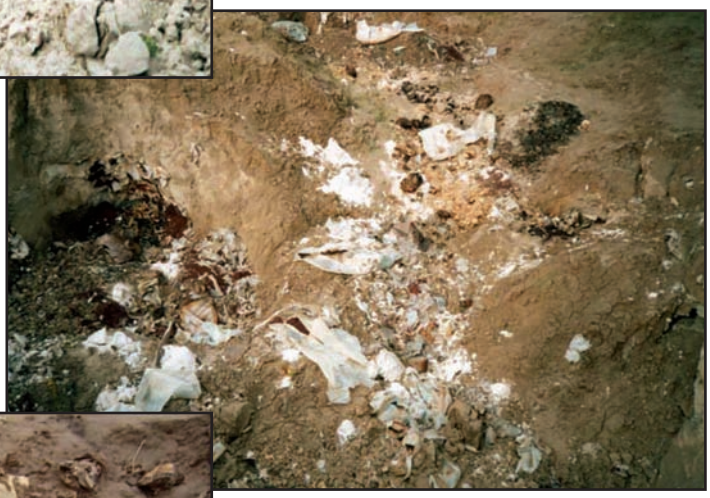
Nowadays, the condition of this burial place is extremely bad, and it is the great problem. In last years was liquidated there guarding, also, there is no any control of their functioning. Lack of fencing and guarding in pesticides burial places made them accessible for local population and domestic animals. Sluice, built in former time in this burial place for collection of rain and mud-torrent flows, are destroyed. It contributes to contamination of located below territories with pesticides, in case if they will be washed down by precipitations.

Presently, due to great deficit of pesticides, local population digs out these pesticides, including forbidden ones, illegally in burial places and then sells them under various names (photo 2.3.1.5).

Extraction of buried pesticides is realized both by hand and by technical equipments; the great scattering of pesticides, leading to contamination of burial place's territory, is observed (photo2.3.1.6).

● *Photo 2.3.1.5 «Excavation» of pesticides in burial place*

Photo: GEF/UNEP Project



● *Photo 2.3.1.6 Surface of burial place, contaminated by excavated pesticides*

Photo: GEF/UNEP Project

All over the territory lie the empty metallic and plastic containers (photo 2.3.1.7).

a) Vahshski burial place

b) Kanibadamski burial place

● *Photo 2.3.1.7 «Storing» of pesticides containers in burial places*

Photo: UNEP/GRID-Arendal

High temperature during summer period and intensive solar radiation contribute to decomposition and evaporation of pesticides, and repeated winds of local origin, and often windstorms stipulate the spreading of objectionable odor and transmission of harmful substances to the significant distances.

Further functioning of Vahshski burial place is not admissible without observation of rules on sanitary and ecological safety. First of all, it is necessary to realize following measures on its accomplishment:

- cleaning of territory from scattering pesticides and their containers with consequent burying in accordance with appropriate standards and rules;
- reparation of sluices for collection of rain and mud flows;
- rehabilitation of cautions signs in adjoining territories, fencing of burial place for prevention of free access of population and animals.

Concerning Kanibadamski burial place was accepted the Decision of Executive Committee of Kanibadamski City's Public Council No. 232 from 20th October 1989: "To close the burial place for receiving of pesticides and their containers; and apply to Regional Executive Committee and Regional "Selhozhimia" Organization with request to solve issue about re-location of burial place in one month". However, till nowadays this Decision is not implemented.

Presently, it is necessary to assess the condition of burial places for elaboration of technical documentation on their neutralization (sterilization).

The National Register on obsolete and forbidden pesticides, including POPs-containing ones, revealed during initial inventory, is presented in the Annex A 5.

Brief review of existing monitoring data (environment, foodstuff and human organism). In connection with reformation process in the state agricultural system, the realizing of appropriate control of pesticides' quality, registration and observation of rules on their use became complicated. The often chemical treatments against pests are inefficient, but at the same time, it leads to contamination of environment.

In this connection, it is of a great necessity to establish the strong system on control of pesticides import and export. Besides, it is important to improve the public awareness raising process and to increase the professional level of land-users in sphere of harmful properties of pesticides, especially POPs-related ones. Only in this case peoples can avoid the situation, when, instead of benefit, pesticides' use will bring damage for environment and human health.

The incomplete data of certain researches confirm the availability of pesticides, including organochloric ones in soils of irrigated fields; the maximum permissible concentration is exceeded in 3 – 5 times.

Investigations, conducted by Tajik Institute of Hygiene and Epidemiology within Ministry of Health, conducted in 1985, revealed in certain agricultural plants the pesticides residuals with 6 times exceeding of maximum permissible concentrations. Also, were revealed facts of high concentration of pesticides in vegetative foodstuffs and in breast milk of rural women (DDT and its metabolites, γ-HCH). In vegetation products (in 19% of samples) were revealed following: DDT and its metabolites, γ-HCH, BI-58, and such pesticides as sevin, butifos and nitrophenol. In examined cattle breeding products (dairy produce) were revealed DDT and its metabolites, γ-HCH: in butter and sour cream the DDT availability was about 0,05 mg/kg; in sheep's and pig fat the DDT availability was from 0,04 to 0,08 mg/kg; γ-HCH – from 0,02 to 9,14 mg/kg. In fish, delivered from local fish-breeding farms were revealed: DDT residuals till 0,16 mg/kg and γ-HCH residuals till 0,008 mg/kg.

In 1995, by examination of irrigation waters with pesticides, conducted by Tajik Institute of Preventive Medicine of the Republic of Tajikistan, were revealed following: DDT availability from 0,1 to 0,4 mg/l and γ-HCH – from 0,09 to 3,5 mg/l. the γ-HCH residual after treatment of land with land technical means varied from 0,09 to 1,13 mg/l and after aviation treatment – from 0,20 to 0,25 mg/l; it confirms the exceeding of maximum permissible concentration for open water reservoirs in 10 – 12 times (maximum permissible concentration for open water reservoirs is 0,02 mg/l). In channel water, which is used as drinking water in some rural localities due to lack of water pipe system, the availability of DDT and its metabolites and γ-HCH were from 0,01 to 0,02 mg/l.

In 2001, Ministry of Health of RT and Federal Environmental Agency of Germany (UMVEL BUNDESAMT) conducted in 49 districts of republic the examination of underground and

surface water sources on availability of aldrin, dieldrin, DDT and its metabolites. The results are following: in surface waters of Dushanbe city, Faizabadski, Hojamastonski, Vahshski, Kanibadamski and Zafarabadski districts were revealed DDT and its metabolites, aldrin and γ-HCH in quantities, exceeding the standards of drinking water quality. In water of artesian wells there were no revealed even the residuals of pesticides. The alarming factor is the revelation of residuals of DDT and its metabolites - 0,04 – 0,05mg/l, and γ-HCH - 0,02 – 0,04 mg/l in breast milk.

In 2005, by examination of Sanitary Protective Zone of Tajik Aluminum Factory it was revealed that pesticides availability in soils samples varied from 2 to 14 mg/kg, including POPs-relates pesticides – from 0,08 to 7,18 mg/kg of soil. The main contaminants are: DDT and its metabolites, HCH isomers, eptam and ovex, the share of which is, correspondingly, 83%, 60%, 36% and 50% from total number of revealed pesticides. Thus, the exceeding of maximum permissible concentration of DDT and its metabolites in soil is from 6 to 100 times, HCH (sum of isomers) – from 2 to 40 times. Moreover, the residuals of HCB, dursban, lindan, prometrin and in two samples – aldrin and dieldrin we also revealed. Such indicators allow to consider this territory to potential "hot spots".

2.3.2. Assessment of chemical substances in accordance with Annex A, Part II (PCBs).

In accordance with Annex A, Part II of Convention, the following should be done:

- *immediate stopping of new PCBs production;*
- *stopping use of PCB-containing equipment till 2015;*
- *in maximally short period, but not later than 2028, it is necessary to conduct the ecologically safe removal of PCB-containing fluids and equipment, contaminated with PCB.*

PCB storages. On the territory of Tajikistan, there are no any volumes of clean PCBs or PCB-containing oils. In accordance with data of former Ministry of Energy, during last thirty years there were no deliveries of PCB-containing transformer's oils; and in electro-technical equipment are used mainly the PCB-free oils of Т-1500У types, oils of selective cleaning, turbine oils Тп-22с and etc.

PCB-containing equipment. The main PCB consumer was electro-technical industry. In Tajikistan, the PCB-containing transformers and capacitors were never produced; they were imported mainly from republics of former Soviet Union. Solution of PCB problem in Tajikistan began from conducting of initial inventory of PCBs and PCB-containing equipment.

Altogether, inventory was conducted in 190 enterprises, including 43 enterprises of former Ministry of Energy, and 147 enterprises of various industrial branches (non-ferrous metallurgy, food, textile, chemical industry and etc.)

Transformers. Till now, in Tajikistan are exploited the flame-proof transformers, filled in with PCB-containing sampling liquid dielectric. Transformer oils of TNZ, TNZP, TNP) and others contain PCBs.

On the results of initial inventory, in 4 enterprises of industrial sector of Tajikistan are used 12 transformers of TNZP-1600/10, TNZ-1000/10 TNZ-630/10, TNP-400/10 (ТНЗП-1600/10, ТНЗ-1000/10, ТНЗ-630/10, ТНП-400/10) types, produced by "Transformetor" Ltd., Chirchik city. One transformer of TNZ-400/10 type ("Nilufar" Ltd., Isfara city) is decommissioned.

The total number of sovtol in transformers is 20,5 tons.

Capacitors. PCBs used also as insolating liquid in power condensers. Capacitors are like transformers from point of view of PCBs containing. However, the difference is that they are always hermetic. Consequently, the issue of servicing and reparation is not the main one, in case if capacitor is hermetic and in a good condition. At the end of operation life, they pose the same threat as transformers.

As a rule, the dielectric material in capacitors is sampling liquid dielectric, which contains or may contain TCD (trichlorobiphenyl).

The results of conducted inventory showed that in 44 industrial enterprises of republic there are 2743 PCB-containing capacitors; and only in one enterprise of Ministry of Energy (Shabakahoi Barkii, Dushanbe city) were revealed 21 capacitors of КСО-0,38-12,5 type.

Number of PCB-containing capacitors is 2764, where the volume of PCBs is 61,7 tons.

The total volume of PCBs in capacitors and transformers is 82,2 tons. The great part of PCB-containing electro-technical equipment is used in non-ferrous and ferrous metallurgy - 57% or 47,0 tons of PCB; about 13% - local industry, and 11% - light industry (Diagram 2.3.2.1).

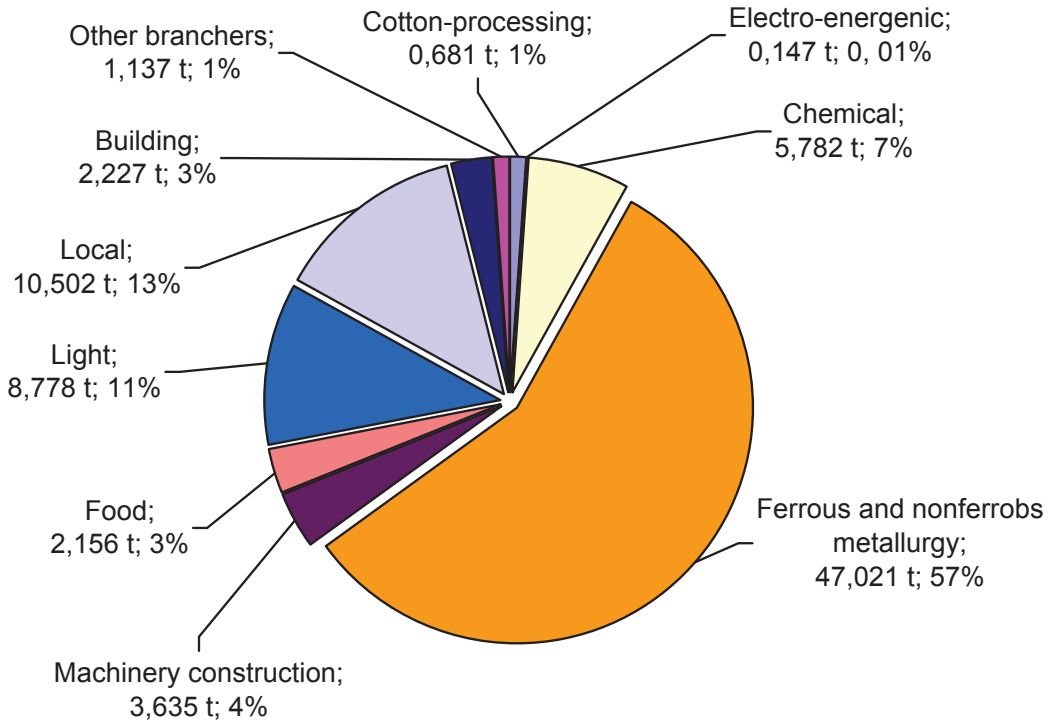


Diagram 2.3.2.1 Distribution of PCBs in industrial branches of Tajikistan, 2003.

In administrative context of PCBs distribution, the main share belongs to RRS (44,248 tons or 54%), and mainly due to its consumption by State Unitary Enterprise "Tajik Aluminum Company", located in Tursunzadevski district (Diagram 2.3.2.2).

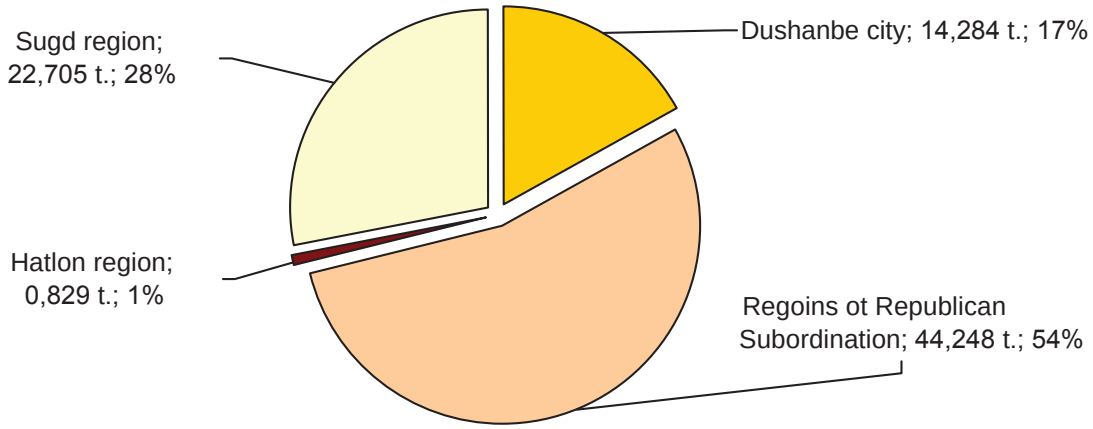


Diagram 2.3.2.2 Distribution of PCBs in regions, 2003.

During conducting of initial inventory, no one case of use TCD, Sovol or Sovtol as hydraulic fluids was revealed.

PCB-containing wastes. Data received from 47 industrial enterprises showed that PCB volume in decommissioned PCB-containing electro-technical equipment (transformers and capacitors) is 14,4 tons. This equipment relates to PCB-containing wastes. At the moment of inventory conducting, the decommissioned and removed equipment was found in State Unitary Enterprise "Tajik Aluminum Factory", State Enterprise "Tojik Cement", "Korhonai Armaturi" Ltd., "Korhonai Mebel" Ltd., and others. The total number of decommissioned electro-technical equipment is 601 (22% from all revealed number).

The received data were classified and presented both in territorial aspect (Diagram 2.3.2.3) and in aspect of industrial branches (Diagram 2.3.2.4).

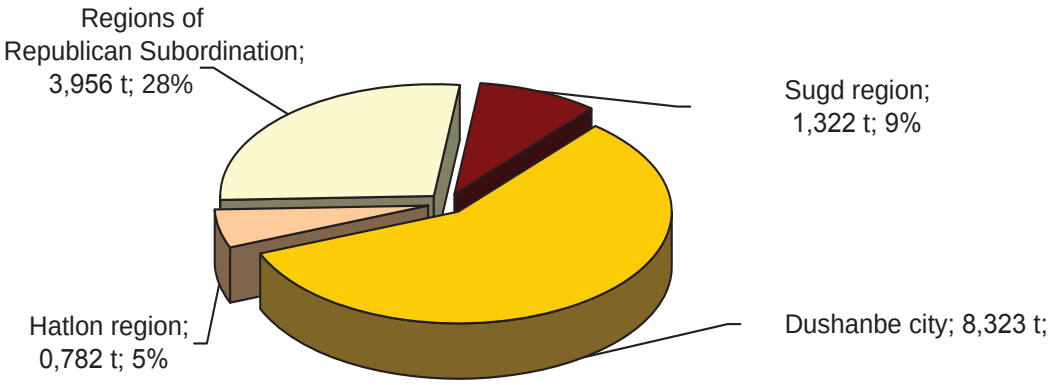


Diagram 2.3.2.3 Distribution of PCB-containing wastes on regions, 2003.

The main part of PCB-containing wastes relates to enterprises of light industry (48%), production and processing of non-ferrous and ferrous metals (28%) and chemical industry (12%) (Diagram 2.3.2.4).

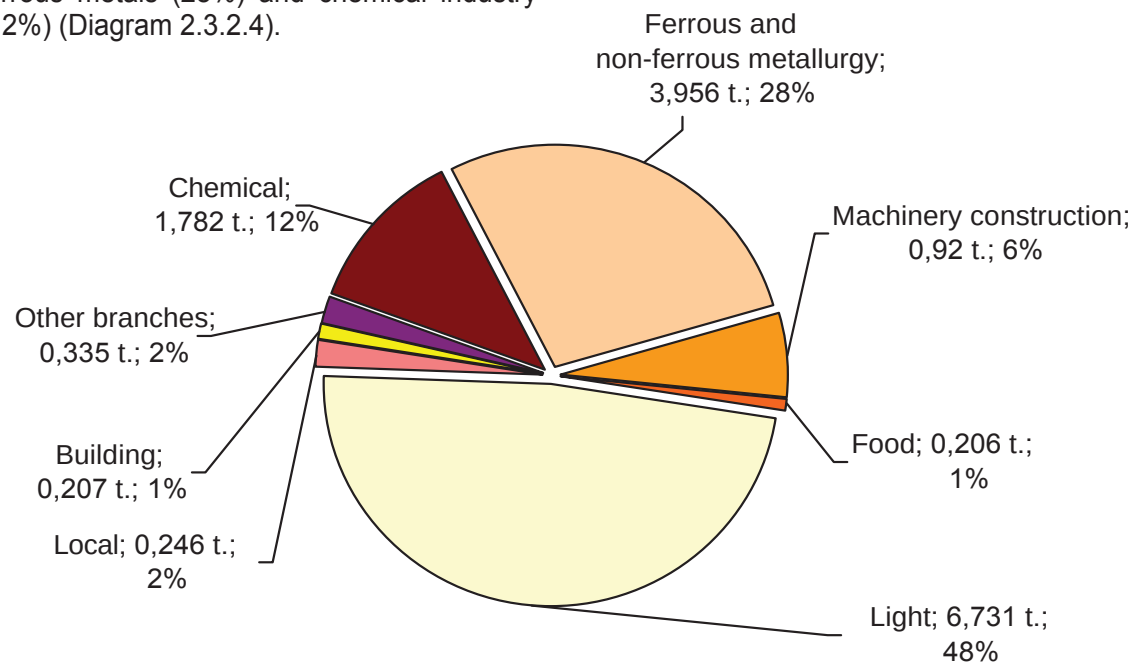


Diagram 2.3.2.4. Distribution of PCB-containing wastes on industrial branches, 2003.

Most often, the decommissioned transformers and capacitors are kept in the open-air or along the walls of workshops on the territory of enterprises without observation of elementary safety measures. (photo 2.3.2.1).

Photo 2.3.2.1 «Keeping» of decommissioned PCB-containing capacitors in the enterprise.

Photo: GEF/UNEP Project

The cases of many capacitors, even of the used ones, are corroded, and the traces of PCB leakage are visible (photo 2.3.2.2). In places with big number of such equipment there is the PCB odor, and it is the serious threat for health of both workers in these enterprises and population of neighboring settlements. The attention should be paid to the fact that Tajikistan is the country with high solar radiation, contributing to increasing of PCB evaporation.

Photo 2.3.2.2 Exploited PCB-containing capacitors with corroded cases.

Nowadays, State Unitary Enterprise "Tajik Aluminum Factory" prepares the appropriate documentation for establishment on its territory the special place for temporary keeping of decommissioned equipment till its destruction in accordance with all requirements, intended for such objects. Perhaps, this storage facility will operate not only for State Unitary Enterprise "Tajik Aluminum Factory" but also for industrial enterprises of central and southern regions of the country. For enterprises, located in northern part of Tajikistan, should be established the temporary storage facility in of Sugd region.

Besides primary wastes (fluids and decommissioned equipment), the great number may form as secondary wastes by means of leakage of PCB-containing fluids, which will contaminate the environment (soil, building sites, uncontrolled dumps of solid wastes and etc.).

The source of environment contamination is also the thrown to the dump small PCB-containing electronic equipment. It is the risk of uncontrolled accumulation of PCB-containing elements in environmental components.

It is obviously that formation of PCB-containing wastes will increase in consequent years. Exact data on quantity of such wastes will be received after conducting of detailed inventory of PCB-containing electro-technical equipment.

Testing of transformer oils. During the process of initial inventory of PCB-containing equipment, there were no cases of use PCB-containing oils in transformers, filled in with mineral oils. Moreover, the official answer of "Tajikenergosnab" Dushanbe Enterprise of Material and Technical Provision – main recipient of transformer oils, confirmed that PCB-containing oils for filling in of electro-technical equipment were never imported to Tajikistan.

In this connection, taking of samples from transformers, filled in with mineral oils, for conducting of expensive analyses on PCBs availability, was unreasonable during the initial inventory.

Nevertheless, during inventory on 25 enterprises of Ministry of Energy and Industry were taken samples of transformer oils for conducting of simple test for determination of PCBs availability: test on density (oil samples) and test on chlorine availability (oil samples). In both cases: test on density and test on chlorine availability, the results were negative.

All enterprises of electricity nets of the Ministry of Energy and Industry, and also Dushanbe Heat and Power Plant, Nurek Hydro Power Station have the chemical laboratories, which conduct regularly the physicochemical analysis of transformer oils. Analyses of last 30 years showed that density of transformer oils not exceeded 1 g/cm3, i.e. it was always lower than water density, and it is the confirmation of PCB absence in them.

In State Unitary Enterprise "Tajik Aluminum Factory" was conducted inventory and testing of transformer oils in all operated transformers (512 units) for PCB availability. The received results showed that PCB is available only in 2 transformers of ТНЗП-1600/10 type (oil density 1,560), in all other 510 transformers of АТРОМ, ATF, TMZ, TM, TDNP, OD and TDD types the density of transformer oils varies in the limits 0,855 - 0,880 g/cm3.

Thus, during initial inventory of PCB-containing electro-technical equipment in Tajikistan, 612 transformers were tested.

National PCB Register is presented in Annex A6.

2.3.3. Assessment of chemical substances in accordance with Annex B (DDT).

Chemical substances, the use of which should be limited, are listed in Annex B of Stockholm Convention. DDT relates to these substances.

Photo: GEF/UNEP Project

In accordance with Article 4, there are following provisions of Convention concerning DDT:

- to stop production and use, excepting use in the limits of programs on combat against carriers of dangerous diseases;
- to support scientific researches and elaboration of safe DDT alternatives;
- to register, by means of sending written notification to the Secretariat, concrete exemptions to the Annex B by receiving status of Stockholm Convention Party, and availability of request about prolongation of such registration; to present serious basis for such prolongation (Article 4, Item 3).

DDT is the substance of Convention, which production and use should be limited. Production and use are necessary only for control of diseases spreading. Its production is permitted also in case, if DDT is the intermediate of declofol production or the self-contained system with limited space, where is observed the chemical transformation by production of chemicals without POPs properties.

Limitations of DDT use are based on its valuable properties for protection of human health (for example: vector control for prevention of malaria and encephalitis).

The time period, defined for exemption on certain chemicals, is usually, 3 years or less from the moment of coming Convention into force. On the base of request or due to extraordinary situation may be accepted the decision on the Conference of Parties concerning prolongation of exemption for additional 3-year period.

Parties, requesting permission for exemption, should submit the report to Secretarial, which will be considered during Conference of Parties for elaboration of recommendations to the country, which needs in this exemption.

Agriculture. In Tajikistan, DDT was never produced, but it used for protection of agricultural fields from detrimental insects, and also in veterinary, in households and in health care. During period from 1960 to 1971, for use in agriculture and forestry were imported about 105 thousand tons of DDT. Nowadays, DDT is not included to the list of permitted preparations for use in agriculture and forestry.

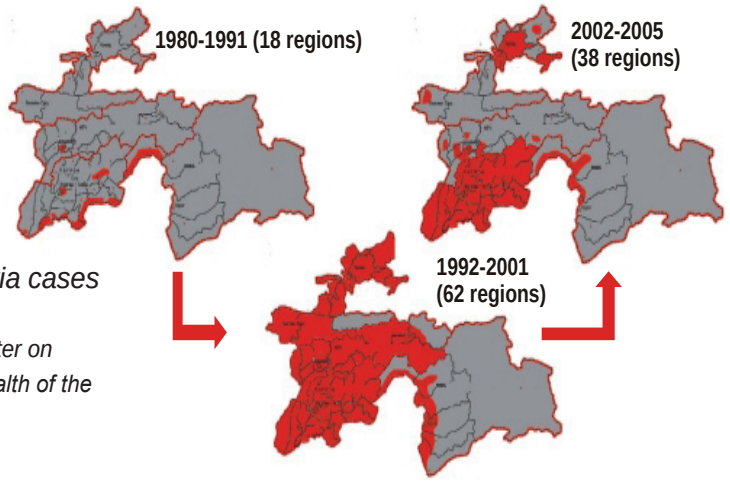
As a result of the fact that DDT was forbidden more than 30 years ago, all information about its distribution inside republic is lost, and it is impossible to make the assessment on the documentation. At the same time, in accordance with experts' opinion, DDT is still used in certain rural locations, which have their former stocks, because they don't know about condition of this overdue pesticide.

Health care. The official malaria combat in Tajikistan began in 30th years of the last century, when the number of morbidity reached 100-200 thousand peoples per year*. Decreasing of morbidity slowed slightly in 1941 – 1945, and then continued to decrease till 1954. In that year, the number of patients still was 10 thousands per year, and it was made a decision about complete liquidation of malaria in Tajikistan. As a result of mass anti-malaria measures, and mainly thankful to introduction of DDT – strong insecticide, the morbidity in consequent 6 years decreased more that in 100 times. Average in republic, the intensive indicator of morbidity decreased to less than 10 patients per 100 thousand of population. In this connection, mass anti-malaria measures were stopped.

However, on this background revealed a new factor (the importance of which was formerly underestimated) – high level of transmission of malaria from Afghanistan to neighboring villages of Tajikistan. For conservation of reached epidemiological favorable situation, it was necessary to continue the relieved complex of measures on DDT treatment in frontier zone with Afghanistan. In 50 – 60th years, the existing tactics of entire DDT treatment all over malaria zone in the country was replaced with varied measures accordingly to epidemiological peculiarities of various types of zones. The entire DDT treatment was conducted only in zones of independent endemic outbreaks. Thankful to such approach, the favorable epidemiological situation in republic was stable during 18 years (1963 – 1980), i.e. in problematic zone (8 frontier administrative districts) were registered only 135 local patients in 25 malaria pestholes.

The supporting of relative malaria-free situation in frontier zones was stipulated also by anti-malaria measures in Afghanistan, which were conducted by specialists from USSR during period from 1971 – 1978. At the first time in 1978 the three-day malaria was carried from frontier zone to the territory of Tajikistan (Kulyab city). The local epidemiological outbreak (more than 100 cases) was the dangerous symptom of breaking system of the epidemiological control.

As a consequence, the multiple cases of malaria carrying during military actions in Afghanistan (transmission with military men, relatives of local population, refugees and etc.) are considered as the reason of great malaria epidemic in Tajikistan (map 2.3.3.1).



Map 2.3.3.1. Districts of Tajikistan, where the local malaria cases were registered.
Source of information: Republican Center on Tropical Diseases within Ministry of Health of the Republic of Tajikistan, March 2006.

The scale of this epidemic was not known exactly due to internal instability and civil conflict in republic during the beginning of 90th years. In accordance with data of WHO experts, the morbidity was registered in all regions; the number of patients in 1996 was about several dozens thousands, and in following years this indicator increased including tropical malaria cases. The highest level of morbidity was in Kurgan-Tyube and Kulyab groups of region; and it was visible, that malaria situation in Tajikistan was beyond control and became more dangerous than in 30th years of previous century.* The single, but important difference was share of tropical malaria was rather little.

Taking into consideration the risk of such situation, the group of leading specialists of the Ministry of Health of the Republic of Tajikistan and WHO experts elaborated the First National Programme on Malaria Control for the years 1997 – 2005; the Programme was approved by Governmental Statement of the Republic of Tajikistan N 342 from August 1997. USAID, CDC, UNICEF, WFP, ECO, MERLIN and ACTED were the partners of WHO Programme "Malaria Turn Back" in Tajikistan.

Purposes of Programme on Malaria Control in the Republic Tajikistan were following:

short- and medium-term:

- to prevent the mortal cases from malaria;
- to stop and prevent out-breaks and epidemics;
- to decrease morbidity / spreading of malaria;
- to prevent the renovation of malaria carrying and preserve territories where malaria was already eradicated.

long-term:

- to stop spreading of P. Falciparum malaria (by 2010);
- to stop spreading malaria completely (by 2015).

Anti-malaria measures in 1998 – 2005 were conducted in Tajikistan by use of POPs-free preparations, such as Aikon, Solfac, Permetrin, Triton and Malation, which were delivered to the country as the humanitarian assistance. During this period, the number of malaria cases decreased from 30 000 to 3 000 Diagram 2.3.3.1).

In connection with completion of First National Programme period and continuation of malaria spreading, the Government of the Republic of Tajikistan approved new "Programme on Tropical Diseases (Malaria) Control in the Republic of Tajikistan for the period of 2006 – 2010" by the Statement No. 502 from 30th December 2005. From January 2006, by the financial support of Government of the Republic of Tajikistan and Global Fund on AIDS, Tuberculosis and Malaria Control, started the work on this Programme realization. Within Government of republic was established National Coordination Committee on AIDS, Tuberculosis and Malaria Control, which included representatives of governmental, nongovernmental, religious and public organizations.

Main tasks of Programme on Malaria Control and Project of Global Fund in Tajikistan:

- improvement capacities of special anti-malaria service and health care system in whole;
- improvement of access to early diagnosis and appropriate treatment of malaria;
- providing effective and sustainable control of malaria carriers;
- improvement capacities on early revelation and prevention of malaria epidemics;

* - A.Ya. Lysenco, A.V. Kondrashin «Malariologia», WHO, Geneva - 1999, p. 146.

- strengthening of epidemiological control system, including existing mechanisms on monitoring and evaluation;
- capacity building in research sphere;
- public awareness raising and involvement of population to the activities on malaria prevention and control.

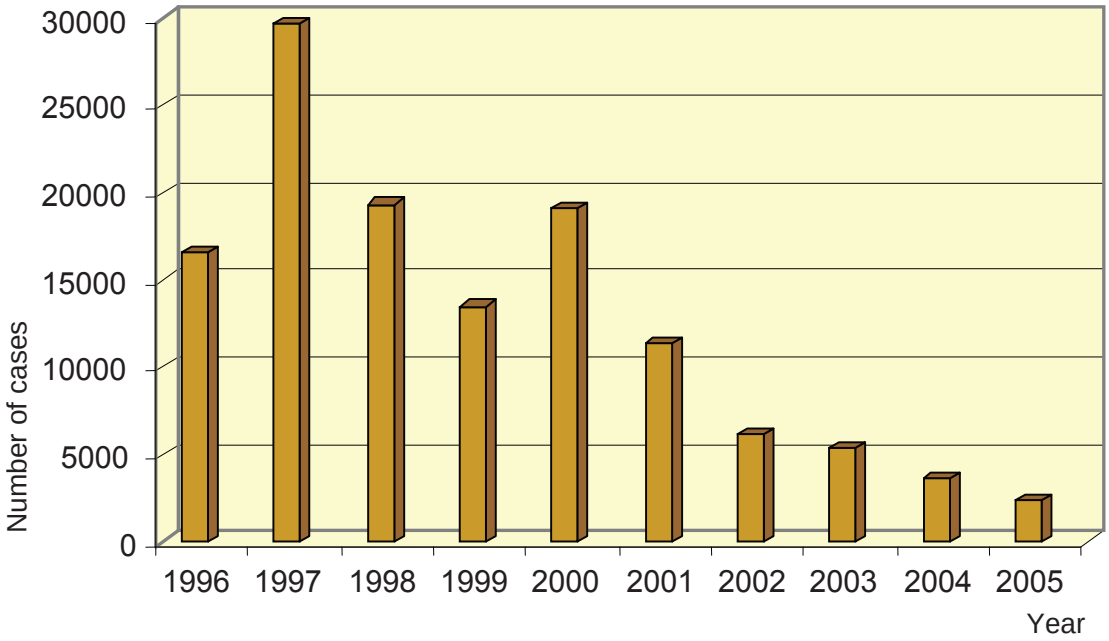


Diagram 2.3.3.1 Dynamics of malaria morbidity in Tajikistan in 1996 – 2005.

Source of information: Republican Center on Tropical Diseases within Ministry of Health of the Republic of Tajikistan, March 2006.

Current malaria situation in Tajikistan (the source of information – Republican Center on Tropical Diseases Control within Ministry of Health of the Republic Tajikistan, map 2.3.3.2.). Regions, where malaria is the serious health care problem: Hatlon region (pink color) and Regions of Republican Subordination (RRS) (blue color). In Sugd region – northern part (yellow color); RRS – central part and Gorno-Badahshan Autonomous Oblast – Vanch, Darvoz and Rushon (green color) the malaria outbreaks are neutralized, but local cases of malaria are registered here yearly; there is a high risk of new malaria outbreaks. In southern part of Sugd region and in northern part of RRS are registered the sporadic malaria cases, and here also is the risk of further malaria spreading. During last two years, the cases of local malaria cases transmission were not registered both in eastern part of RRS and Gorno-Badahshan Autonomous Oblast (excluding Darvoz, Vanch and Rushon districts).

The prognosis of malaria spreading in Tajikistan is not favorable.

About 4,5 millions of peoples or 64% from total population of republic live in zones of potential malaria risk.

Appearance of the endemic malaria in southern districts of Tajikistan.

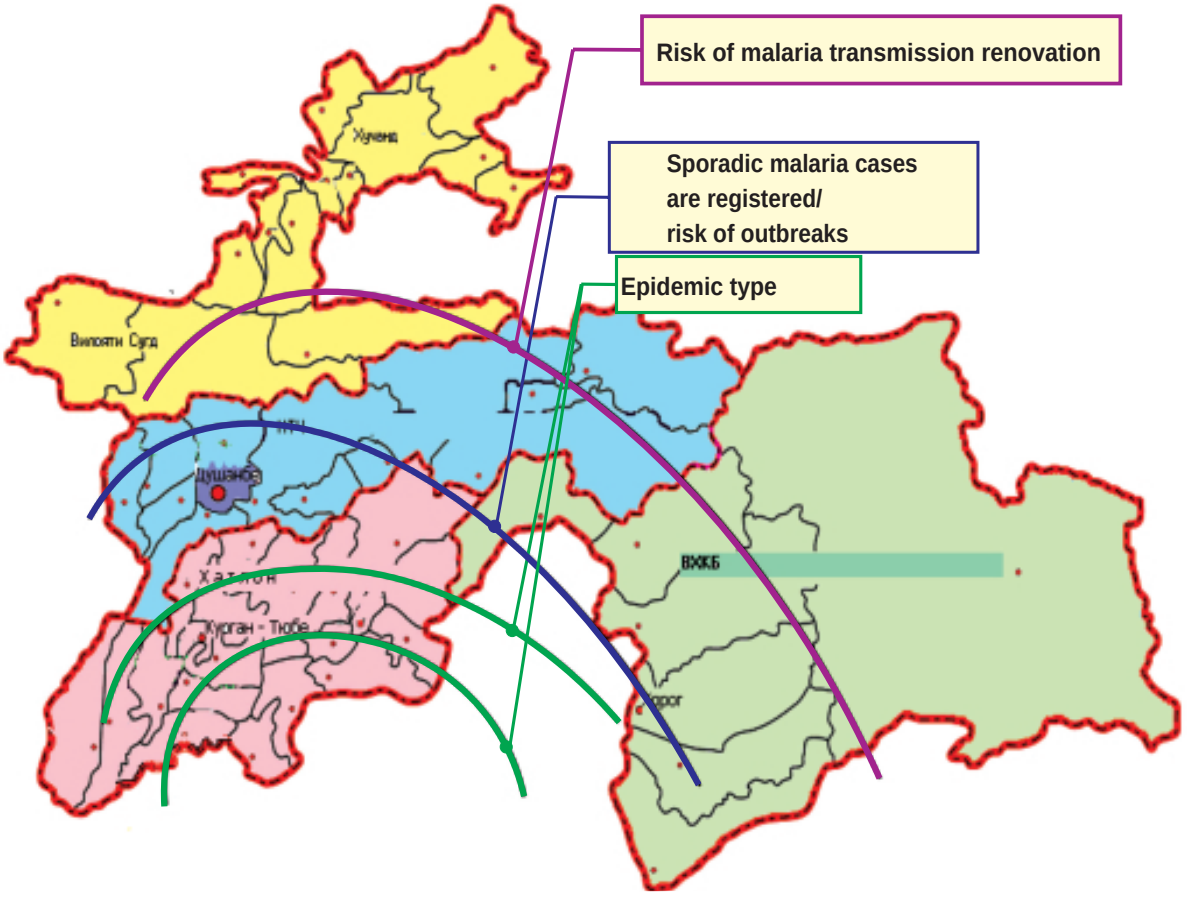
The situation is aggravated by spreading of drug resistant p.falciparum malaria in Tajikistan.

In Tajikistan is registered the high level of unsuccessful treatment of p.falciparum malaria cases with chlorochin and sulphadoxin-primetamin.

The aggravation of malaria situation in frontier with Afghanistan districts is observed.

In accordance with evaluation data, if the appropriate measures against malaria carriers will be not undertaken, the number of malaria cases in Tajikistan may reach 250 000 – 300 000.

Nowadays, USA renders support to the republic by delivering DDT alternatives, and in particular alfacipermetrin in framework of Project “Global Fund on HIV/AIDS and Malaria Control”. The price of these preparations is significantly higher that DDT, and such price is unacceptable for Tajikistan, which is a country with relatively small budget. High price of anti-malaria measures was formerly and is now the serious obstacle in sphere of malaria control both in developing countries and in countries with economy in transition, such as Tajikistan.



Map 2.3.3.2 Stratification of malaria in Tajikistan, 2005.
Source of information: Republican Center on Tropical Diseases within Ministry of Health of the Republic of Tajikistan, March 2006.

In spite of existing malaria situation in the country, Ministry of Health of Tajikistan considers that for malaria control should be used only DDT alternatives (i.e. preparations, which have not the POPs properties).

If in Tajikistan the epidemiological control will be not strengthened, the republic may become a main "donor" of malaria for many countries in the world, and first of all, for CIS countries, especially taking into consideration the migratory processes, which are more and more intensive.

2.3.4. Assessment of emission of unintentionally produced chemical substances, included to the Annex C (dioxins and furans).

In the Article 5 of Convention is specified following concerning unintentionally produced POPs:

to decrease, and if possible, completely stop the emissions of chemical substances, listed in Annex C, Part I (dioxins and furans), produced by anthropogenic sources.

2.3.4.1. Structure of sources of the dioxins and furans emission to the atmosphere.

The significant part of formation of unintentionally produced POPs (uPOPs) and their emission to the environment is realized by thermal processes and by availability of organic substances and chlorine as a result of incomplete burning or chemical reaction process.

In accordance with Annex C of Convention, the definition of main sources of dioxins and furans emissions to the environment is following:

Annex C, Part II: Categories of sources, leading to relatively high level of formation and emission of dioxins and furans to the environment:

- installations for combustion of wastes, including ones for combined combustion of municipal, hazardous and medical wastes or sediments of sewages;
- cement kilns for combustion of hazardous wastes;
- production of cellulose with use of elemen-

tary chlorine or substances, forming elementary chlorine for bleach;
- following thermal processes in metallurgy:
  - secondary copper production;
  - agglomeration installations on enterprises of ferrous metallurgy;
  - secondary aluminum production;
  - secondary zinc production.

To the above-mentioned important sources, the Convention adds following potential sources:

Annex C, Part III: Categories of sources:
- combustion of wastes, including garbage dumps, in the open air;
- thermal processes in the enterprises of metallurgical industry, not included to the Annex II;
- sources, connected with combustion processes in households;
- combustion of fossil fuel in boilers of municipal and industrial systems;
- installations for combustion of woods and other bio-mass fuel;
- certain processes on production of chemical substances, connected with emission of uPOPs and, first of all, chlorophenol and chloraniline;
- crematoria;
- transport means, and first of all, using ethylized fuel;
- combustion of carcasses;
- dyeing (with use of chloraniline) and processing of material in textile and tanning industry (by use of alkali extraction);
- installations for processing of decommissioned vehicles;
- treatment of copper cables with smolder;
- enterprises of processing of waste oil.

2.3.4.2. Potential sources of unintentionally produced POPs in Tajikistan.

As a result of initial inventory, from 10 categories of potential sources of dioxins and furans, described in "Methodical Manual on Revelation and Quantitative Assessment of Dioxins and Furans Emissions", the most significant for Tajikistan are following:

Category № 2. Production of ferrous and non-ferrous metals (sub-category c) production of cast iron and steel (foundry), e) aluminum production, d)copper production, f) lead production, h) brass production, j)production of other non-ferrous metals),

Aluminum production: Energy resources of Tajikistan are 527 billions kilowatt / hour, from which only one fourth may be used effectively. Taking into consideration the availability of cheap electric power, in republic was built the large-scale enterprise on aluminum production: State Unitary Enterprise "Tajik Aluminum Company", located in Tursunzadeh city. In 2002, Tajik Aluminum Company produced 307,6 thousand tons and in 2003 – 320 thousand tons of aluminum (it is the high quality of aluminum of highest and high types of various kinds: ingots; T-shaped, cylindrical and large-sized bars up to 10 tons; rolled wire of various profile and etc.); planned productive capacity of this Company is 500 thousand tons of aluminum per year. Metallic aluminum is produced by electrolytic regeneration in electrolysis baths with use of graphitic anodes (burnt anodes), which are produced in this plant. By production of graphitic anodes is used the great number of petroleum coke. Burning of "green" anodes is conducted in glowing furnaces.

There is limited information on unintentionally producing of dioxins and furans in this sector. It is not considered as a large source of emission. At the same time, such scientists of Russia, as N. A. Klyuev, B. A. Kurlandski, B. A. Revich and B. N. Filatov, emphasized in the book "Dioxins in Russia" (2001) that in Krasnoyarsk city was revealed following: the share of these substances emission to atmosphere from aluminum factory is 70%, and 22% of total emission of dioxins and furans from all enterprises of city accumulated on the land surface. The highest level of dioxins and furans emissions was registered by production of burned anodes.

Aluminum production from scrap iron, containing aluminum, is realized, besides Tajik Aluminum Factory, in several enterprises of republic, which are located in Sugd region: "Kairakkum Carpets" Ltd. (Kairakkum city), "Bodom" Ltd. (Kanibadam city), "Hunar" Ltd. (Hujand city) and Shurabski Mechanical Factory (Shurab city). In 2003, in these enterprises were smelt 460 tons of secondary aluminum. The secondary aluminum production is realized in cupola-furnaces and induction furnaces.

Production of cast iron and steel (foundry production): there are no special enterprises in Tajikistan for production of cast iron and steel, but their secondary processing (smelting) is realized by following enterprises: "LKRM" Ltd., TSMM"BPIP Ltd., "China-Tajik-Metallik" Ltd., "Bodom" Ltd., "Kairakkum Carpets" Ltd., "Lal" Ltd., "Nauselmash" Ltd., Tajik Aluminum Company, State Unitary Enterprise "Tajiktextilmash", "Humo" Ltd. (former "Tajikgidroagregat" Ltd.) and "Korhona Armaturi".

Copper production: copper production is realized in "LKRM" Ltd. in Sugd region. In 2003, in this enterprise were produced 5 tons of copper from scrap iron. Melting of scrap iron is made in copper furnace. For cleaning of gases is used "Cyclone TSN-15". Emissions are under the control. Dioxins and furans emission depends on scrap-iron composition.

Lead production: in 2003, from scrap iron, received by processing of vehicles' accumulators, in "Grant" Enterprise of "Sadaf" Ltd. (Hujand city of Sugd region) were received 0,5 tons of lead. The smelting is realized in injection-molding machine; for cleaning of waste gases is used the bag collector.

Brass production: in 2003, in "Bodom" Ltd. was produced 40 tons of brass. The brass production is realized in induction furnaces; there is no any system for air contamination control.

Production of other non-ferrous metals and alloys: in "LKRM" Ltd. (Hujand city of Sugd region) is produced the aluminum-vanadium ligatures (alloys). The main raw material for ligatures production is vanadium oxide (Y) (V2O5) and aluminum powder (AP-4). In 2003, the volume of ligatures production was about 200 tons. "Vostokredmet" Ltd. (Chkalovsk city of Sugd region), together with production from non-traditional kinds of raw materials of clean vanadium oxide (Y) (V2O5) and parting of gold and silver, is produced the alloy of ferromolybdenum from technical molybdenum oxide. In 2003, this enterprise produced this alloy in volume of 1900 tons. The ferromolybdenum alloy is produced also in "Rasuliyon" Ltd. (Hujand city of Sugd region), where as the starting materials are used the ingots of refractory and rare metals. In 2003, this enterprise produced ferromolybdenum in volume of 2000 tons. The waste gases from both these enterprises are cleaned through multi-stage cyclone system, scrubbers, dust-suppression chambers and mist separators.

Category № 3. Production of electric and thermal energy (sub-categories: a) electrical boilers on fossil fuel; d) heating of houses on bio-fuel; and e) heating of houses on fossil fuel).

Dushanbe Heat and Power Plant and Yavan Heat and Power Plant (not functioning now), and also the installations, producing thermal power for heating houses with fossil fuel and bio-fuel (mainly natural gas) are the potential sources of dioxins and furans.

General power production in republic in 2003 was 16407 millions kilowatt/hour; including 102,866 millions kilowatt/hour (0,6%) were produced by Dushanbe Heat and Power Plant with use as fossil fuel, mainly, natural gas.

For power production in industry are used various installations: from small furnaces with automatic stokes to large complicate systems with steam generated units, which were built mainly in 50-80th years of former century, and control of contaminations emission – cyclone, scrubbers and electric filters. However, the majority of dust/gas cleaning devices are already technically and physically obsolete; that is why, the quality of cleaning is not higher than 60%. In 2003, in accordance with State Statistics Committee data, total consumption of natural gas was 1410 thousand tons of standard coal; black oil – 329,5 thousand tons of standard coal; and coal – 3,8 thousand tons of standard coal.

In 2003, the municipal sector used: gas - 447,61 thousand tons of standard coal; black oil – 0,096 thousand tons of standard coal; and coal – 0,284 thousand tons of standard coal.

Rural population of republic, due to lack of access to natural gas and coal, due to limitation of electricity supply especially in winter period, uses mainly bio-fuel: firewood and *guzapoya – cotton stalks* (photo2.3.4.1) for heating of houses and cooking.

Photo 2.3.4.1 Use of guzapoya in household for cooking

Photo: GEF/UNEP Project

Category № 4. Production from mineral raw materials (sub-categories: a) cement furnaces, b) lime production; c) bricks production; f) asphalt blends production).

There are in republic about 50 enterprises on building materials production, which are considered as sources of dioxins and furans.

Cement production: State Unitary Enterprise "Tojiksement" (Dushanbe city) – is the single enterprise in republic on cement production; in 2003 it produced 193,6 thousand tons of cement. Cement is produced by liquid method. The temperature regime in rotary furnaces is supporting on the level of 1200 – 1450 ^{0}C, and this factor excluded the formation of dioxins and furans in great volumes. Temperature of waste gases in the place of exit is not higher than 300^0 C; as a fuel is used here the natural gas. It is considered that clinker contains no any dioxins and furans, but dioxins and furans are formed and then are thrown with dust after combustion of fuel. The waste gases are cleaned by multistage cleaning in de-duster chambers, electric filters UG-2-3-37 and UG-2-10, set of cyclones and cloth filter of FRKI-90 type. Dioxins and furans emission depends on effectiveness of waste gas cleaning by dust/gas cleaning devices, which are seriously obsolete both technically and physically in "Tojiksement" Ltd.

Production of building bricks: building bricks are produced in 20 enterprises of republic; the largest of them are: "KCM" Ltd. (Isfara city, Sugd region) – 22,5 thousand tons, State Unitary Enterprise "Tajik Aluminum Company" – 9,4 thousand tons, "Farfor" Ltd. (Tursunzadeh city, RRS) – 9 thousand tons. In 2003, the total number of produced bricks was 98,2 thousand tons. Burning of raw bricks (feed stock is local clay) is realized in circular furnaces and tunnel kilns; the natural gas is used as a fuel. There is no contact of gas with burning gas. Dioxins and furans emission is stipulated by fuel combustion; in all these plants there is no cleaning of waste gases.

Lime production: lime is produced in 11 enterprises; the largest are: "Tajikhimprom" Ltd. (Yavan city, Hatlon region) – 53 thousand tons; "Stoimateriali" Ltd. (Dushanbe city) – 6 thousand tons; in 2003, the volume of production was 60,9 thousand tons. The lime is produced by burning of limestone in, mainly, circular and shaft furnaces by the temperature about 1200^0 C, where the dioxins and furans formation is higher than in rotary furnaces. The rotary furnace is only in "Tajikhinprom" Ltd.

Asphalt blends production: asphalt blends are produced in 14 enterprises; the largest are: State Unitary Enterprise "Tajikair" (Former State Air Company of RT "Tojikistan") (Dushanbe city) – 50 thousand tons; Sugd Air-Enterprise – 30 thousand tons, Road Building Enterprise No. 11 (Penjikent city, Sugd region) – 15 thousand tons; in 2003, the volume of production was 130,5 thousand tons. As a rule, the asphalt/concrete plants of republic have multistage cleaning of waste gases.

Ceramics and glass production: in 2003, in "Farfor" Ltd. (Tursunzadeh city, RRS) were produced 1842 thousand units of white-wares; in "Lal" Ltd. (Hujand city, Sugd region) – 20,5 tons of glass-mass. In "Lal" Ltd. (Hujand city, Sugd region), the waste gases are cleaned by the system of dust/gas cleaning; as a fuel is used, mainly, the natural gas.

Category № 5. Transport (sub-categories: a) four-stroke carburetor engines; b) two-stroke carburetor engines, c) diesel engines).

In 2003, total number of vehicles in Tajikistan was 192095 units, including 40239 for use of juridical persons (enterprises) and 151656 – for use of physical persons. Accordingly to State Statistics Committee data, the import and consumption of petrol in 2003 was all over republic:

- gasoline – 156,0 thousand tons, 10% from this number is unleaded gasoline without catalyst (15,6 thousand tons);
- diesel oil – 180,5 thousand tons.

Category № 6. Uncontrolled combustion processes (subcategories: a) forest fires; b) fires, wastes burning, fires in industry and accidental fires).

Accordingly to data of Ministry on Extraordinary Situations, in 2003, the number of fires in state and private enterprises was 869, and in municipal sector – 403.

Accordingly to data of former State Committee on Environment Protection and Forestry, the large-scale forest fire in republic in 2000 took place in nature reserve "Tigrovaya Balka"; 4,12 thousand ha of forest territory were destroyed by fire and 2,557 thousand tons of woods were burned. In 2003, the large-scale forest fires were not registered.

There are no data about number of combusted agricultural wastes in agricultural fields (in Tajikistan, only the remainders of crops, in particular wheat, are combusted in the fields).

Solid municipal wastes (SMW). There is no any state statistics registration of formation

SMW in republic. There is no selective collection of SMW, incineration plants or wastes processing plants in republic. Re-use or recycling of wastes is also not realized. Burying of SMW is the main method of their removal (photo 2.3.4.2). Morphological composition of SMW was changed during last 15 years . According-ly to State Unitary Enterprise "Hojagii Manzili Kommunali", in 2003, the share of polymeric wastes was 27,3 %, kitchen wastes (foodstuff remainders) – 35,0 %, leaves – 12,0 %, paper and cardboard – 11,0 %, glass and ceramics – 7,7 %, leather and metals – 5,0 %.

● *Photo 2.3.4.2. Burial place to SMW, Dushanbe city*

The volume of formed SMW is determined by number of constant urban population. In 2003, the volume of SMW was 1152,52 thousand tons, including 1084,51 thousand tons, removed for burying. In Tajikistan, the problem of SMW utilization is very serious; often, SMW are combusted directly in waste dumps; in SMW burial places there are cases of spontaneous ignition (photo 2.3.4.3). Taking into consideration the approximate data of State Unitary Enterprise "Hojagii Manzili Kommunali" and environmental agencies, about 1% of formed SMW are burnt yearly in SMW dumps of cities and approved burial places (11,53 thousand tons – 2003).

● *Photo 2.3.4.3 Burning SMW burial place, Dushanbe city*

Medical wastes. The process of medical wastes destruction is the significant source of dioxins and furans emission, because is not conducted appropriately. In many medical institutions of republic, especially in remote districts, the separate collection of medical wastes for their special treatment is not conducted. For treatment and removal of medical wastes is used only chemical method of disinfection, by means of 0,5% chloride of lime solution. Such treatment may effect negatively on health of workers, and also lead to ecological problems by combustion of these

Photo: GEF/UNEP Project

wastes after treatment by low temperature, when as a result the dioxins and furans are formed. Certain part of these wastes is used as the secondary raw materials for production of polymeric commodities, which should be not used for foodstuff storing. Separation of medical wastes from other wastes and in accordance with categories in places of their formation is not conducted, in spite of necessity of such work for minimization of wastes, which need in additional treatment. There are no in Tajikistan special incinerators for medical wastes.

The effective system on medical wastes management in Tajikistan is not elaborated, that is why, the data about medical wastes formation and about volumes of annually destructed medical wastes are very approximate. On preliminary assessment, in 2003, the volume of medical wastes was about 70 thousand tons, including the polymeric ones – 2,0 thousand tons. The significant part of medical wastes is collected together with municipal wastes and removed to SMW burial places, or is buried in non-approved dumps, where often the spontaneous ignition of wastes take place, leading to formation of dioxins and furans. On the data of Ministry of Agriculture and Environment Protection, the share of medical wastes is about 5 – 7% from total number of SMW. In 2003, as a result of uncontrolled SMW combustion, which include the medical wastes, the emission of dioxins and furans was about 3,5 g/TE (toxicity equivalent), i.e. 11% of their total emission all over republic.

In 2004, the Republican Center of Immuneprophylaxis received the financial means for installation of small-scale incinerators (SSI). The number of all installed SSI was 26. It was planned to enhance this program for covering of all medical facilities in Tajikistan, where vaccination is conducted. By installation was used the De Montfort model for medical wastes incineration, which was modified with fuel tank for additional fuel delivery. Technical modification of installation was made for reaching of appropriate temperatures by combustion. During visiting of medical facilities was conducted assessment of two small-scale incinerators. In both cases was revealed following: leakage of incinerator's case, flue and door; and as a consequence, ambient air enters to incinerator and black smoke is thrown out to the environment. The oil tank was not connected with combustion chamber. The temperature regime was not observed. In general, the work of small-scale incinerators was not appropriate, so the medical wastes were combusted not completely. Is supposed that in the process of wastes combustion by low temperatures, the unintentionally produces POPs – dioxins and furans are formed. In these incinerators are combusted not only thrust wastes, formed after immunization, but also other types of medical wastes.

For destruction of medical wastes (combustion), and also expired medicines, and confiscated by customs services counterfeits, should be built the special (Biful) incinerators. Nowadays, the expired medicines are combusted in "Tajiktextilmash" Ltd. (Dushanbe city) in the aluminum meltdown furnace, which is not equipped with cleaning devices for waste gases (filters, scrubbers and etc.); it may lead to emission of a number of hazardous substances to the atmosphere, including: nitric oxide, carbon and sulfur, benz(α)piren, and dioxins and furans.

Introduction of BAT and BEP in this sphere is the key for solution of tasks on reduction of dioxins and furans emission and minimization of social problems of workers and local communities.

Category №7. Production of chemical substances and consumer goods (sub-categories: f) chemical substances production).

In Tajikistan, there is no pulp-and-paper industry.

"Tajikhimprom" Ltd. (Yavan city, Hatlon region) produces chlorinated inorganic chemical substances: chloride of lime, liquid chlorine, hydrate of sodium (NaOH), kitchen salt, calcium chloride, quick lime and disinfectant "Belizna" - calcium chloride. In certain conditions by production of above-mentioned substances, the formation of dioxins and furans is possible. In "Belizna" finished product, the concentration of dioxins is about 328,57 pg/kg.

Category №10. Revelation of "hot spots" (sub-category: b) places of chlorine production).

Yavan and Tursunzadeh cities and the territories of their negative effects are considered as the "hot spots". The sources of dioxins emissions on these territories are the agricultural fields, which in former time were treated

Фото: Проект ГЭФ/ЮНЕР

with great volume of pesticides, and industrial enterprises "Tajikhimprom" Ltd. and Tajik Aluminum Company, the industrial processes of which are connected with dioxins and furans formation.

Initial assessment of dioxins and furans emission. Initial assessment of dioxins and furans emission was conducted in accordance with manual, prepared by UNEP Chemicals and presented in "Methodical Manual on Revelation and Quantitative assessment of dioxins and furans emission", 2004, with use of unique for all countries indicators and factors of emission, which are necessary for receiving of contrastive assessment. The annual volume (2003) of dioxins and furans emissions to the atmosphere, in accordance with inventory data, is 31,082 g/TE, coming of these substances to slag - 232,308 g/TE (Table 2.3.4.1).

Table 2.3.4.1. Dioxins and furans emissions from certain categories of sources

Category	Emissions g/TE per year				
	Air	Water	Soil	Product	Slag
Uncontrolled combustion: - combustion of SMW in dumps - fires	3,966 3,457 0,509	0,000	0,000	0,000	7,424
Production of ferrous and non-ferrous metals	13,435	0,000	0,000	0,000	6,915
Production of electric and thermal energy	12,530	0,000	0,000	0,000	0,509
Production from mineral raw materials	0,750	0,000	0,000	0,000	133,384
Transport	0,401	0,000	0,000	0,000	91,500
Production and use of chemical substances and consumer goods	0,000	0,000	0,000	0,000	0,000
Total:	**31,082**	**0,000**	**0,000**	**0,000**	**232,308**

The figure 31,08 g/TE is obviously understated, because the data on combustion of medical wastes, unapproved wastes combustion in enterprises and households were not included; i.e. the categories, which stipulate the significant dioxins and furans emissions, and also other sources of these chemicals formation were not included.

Contribution of certain categories of dioxins and furans sources to the total volume of emission to the atmosphere is presented in Diagram 2.3.4.1, and to the slag – in Diagram 2.3.4.2. The most significant category of dioxins and furans emission sources in republic is production of ferrous and non-ferrous metals – 43,3%, where the main share belongs to aluminum production – 97%.

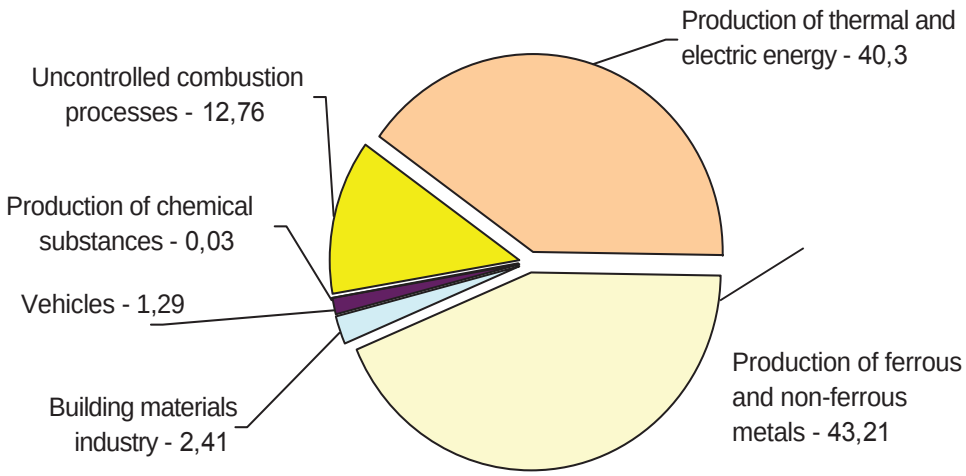


Diagram 2.3.4.1. Percentage of dioxins and furans emission to the atmosphere on certain categories of sources, 2003.

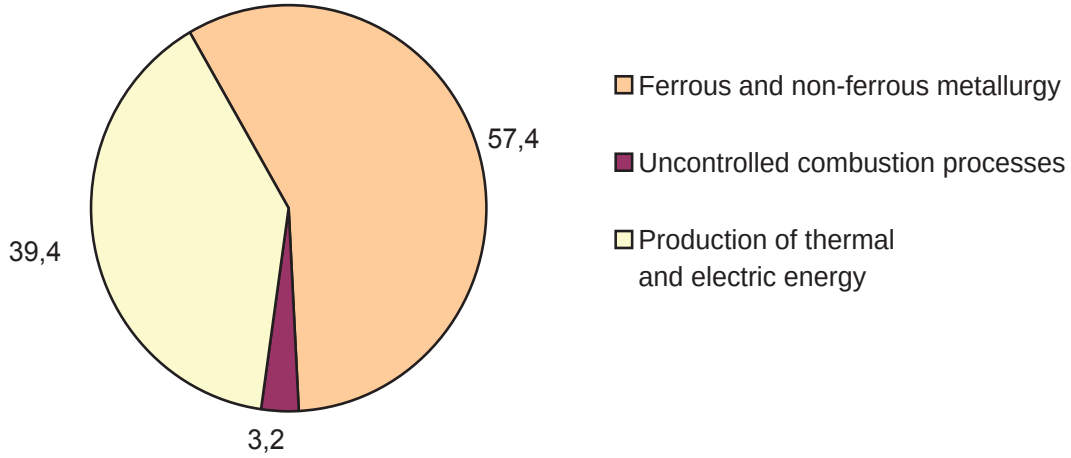


Diagram 2.3.4.2 Percentage of dioxins and furans coming in slag on certain categories of sources, 2003.

Second on its significance category of dioxins and furans sources are small installations on fuel combustion (municipal services and households) – 40,3 %. It is connected with the fact that almost everywhere the population of Tajikistan uses bio-fuel – woods and guza-poya (cotton stalks), especially it concerns the rural population – 74% from total number of population in republic. Dioxins and furans emission from guza-poya combustion is 97,79% from total number of formation these substances, formed by use of bio-fuel in 2003 for heating houses and cooking (Diagram 2.3.4.3). Factor of dioxins and furans emission by combustion of woods/guza/poya is 100 times higher than by combustion of natural gas.

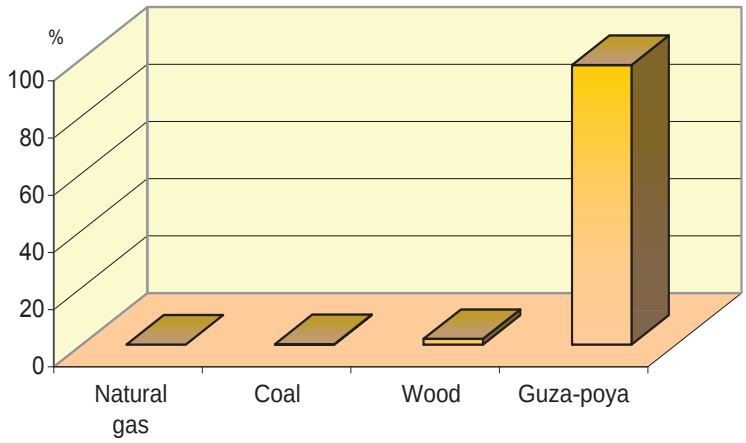


Diagram 2.3.4.3 Percentage of dioxins and furans emission to the atmosphere by fuel combustion in households, 2003.

Contribution of uncontrolled combustion to total volume of dioxins and furans emission is 12,8%, production of building materials – 2,4%. Share of dioxins and furans emission to the air from transport means is 1,2% from total volume of emission. It is the lowest indicator of dioxins and furans emission from all revealed significant sources.

The relatively full information is available only on 5 categories of dioxins and furans emission No. 2, 3 ,4, 5, 6. The are no wastes incinerators in Tajikistan; and in cement furnaces, the combustion of wastes is not realized (category No. 1). Other categories of dioxins and furans emission No. 7, 8, 9 and 10 may be assessed by receiving additional information on used technologies, raw materials, cleaning systems of waste gases and data on of dioxins and furans emission factors.

The main coming of dioxins and furans in slag relates to production of ferrous and non-ferrous metals - 57,4%, and to production of thermal energy and electric power - 39,4 %.

In future, establishment of state monitoring system will let it possible to cover all existing sources of emission in republic and receive the complete assessment of unintentionally produced POPs in Tajikistan. The intermediate report on initial assessment of chemicals, presented in Annex C, Part I of the Conven-

tion, contributes to revelation of important potential sources of these substances, and also the sources, on which the addition information should be received. The intermediate National Register on dioxins and furans emission in Tajikistan reflected the possible diapason of emissions in revealed processes, necessary for early determination of priorities, is presented in Annex A 7. Register of dioxins and furans emission – it is the detailed list of processes categories, identified as sources of emissions of these substances with quantitative assessment of emissions to various environmental components. In framework of preliminary assessment of unintentionally produced POPs were calculated only emissions to atmosphere and sediments. In future, in accordance with Stockholm Convention requirements, by elaboration of final register will be assessed the dioxins and furans emission to all environmental components: air, water, soil, sediments and foodstuff.

2.3.5. Data on POPs storages, contaminated territories and wastes: revelation, determination of quantity, regulations, methodical guidelines, measures for improvement of situation and data on local emissions.

Stocks and wastes of POPs-related pesticides are mainly in storage facilities and two pesticides burial places – Kanibadamski pesticides burial place (Sugd region) – 3,0 thousand tons and Vahshski pesticides burial place (Hatlon region) – 7,5 thousand tons; totally: 10,5 thousand tons. In the storage facility of Zafarabadski district (Sugd region) there are about 17 tons of illegally imported DDT, and 0,55 tons of DDT are in storage facilities of two households of Gissarski district (RRS).

Accordingly to data of laboratory investigations, in the mixtures of pesticides with soil, taken in non-approved excavation places of pesticides burial places, is available great number of various pesticides. In Vahshski burial place, the sum of pesticides in such samples varies in the limits from 11606 mg/kg to 40288 mg/kg. Availability of DDT and its metabolites is about 79% and HCH isomers – 36% from total sum of revealed pesticides. In all examined samples was revealed eptam, lindan, dinoseb, HCB and teodan; and in some other samples were revealed acrex, prometrin and dursban; availability of POPs-related chemicals varies in the limits from 7372 mg/kg to 23921 mg/kg.

In Kanibadamski pesticides burial place, the number of pesticides in mixtures with soil in non-approved excavation places is 2195 mg/kg – 31831 mg/kg, including POPs-related: 327 mg/kg - 8024 mg/kg. The share of DDT and its metabolites is 17 - 35%, and HCH isomers 3 - 13% from total number of pesticides. In majority of samples (85%) was revealed dieldrin in the limits 0,05 - 1,14 mg/kg, and in all samples was revealed HCH, hexachloran, eptam, ovex, acrex, dinoseb and dursban.

Materials of examination Kanibadamski pesticides burial place, conducted in 2002 showed, that the more fare from burial place the lower is level of soils contamination with pesticides. In 100 m from burial place, the DDT and hexachloran availability exceeded maximum permissible concentration in 8 times; in 1200 m, DDT availability exceeded maximum permissible concentration in 3,5 times and HCH – in 1,3 times. In 2 km was revealed DDT in number not exceeded maximum permissible concentration. The surface contamination of surrounding territories with pesticides was the result of rain flows, melting of snow and mudflows, which washed away the upper soil layer of the burial place. By examination of water samples, taken from well (54 m depth) located in Kanibadam city, these substances were not revealed.

The analyses of soils samples (analyses were made by Bashkir Republican Scientific Research Ecological Center, Ufa city, Russian Federation), taken in 2005 in several defined points of zone with negative influence of Tajik Aluminum Company (RRS, Tursunzadevski district), showed the availability of aldrin, HCB, γ-HCH, DDT and its metabolites. Availability of chlordane, heptachlor, dieldrin and aldrin is lower than minimally detected level – 0,001 mg/kg. Exceeding of DDT maximum permissible concentration in all samples of soils is from 2 to 72 times (maximum permissible concentration = 0,1 mg/kg). Total concentration of DDT and its metabolites varies from 0,56 to 9,86 mg/kg, HCH isomers – from to 40 of maximum permissible concentration (Diagram 2.3.5.1).

Analysis of these soils samples for availability of PCBs, as precursor of dioxins and furans, revealed the availability in four (from ten) di-, tri-, tetra-, penta and hexachlorbyphenils, the total number of which is in the limits of 0,02-2,3 mg/kg. Exceeding of relatively safe level of influence on the sum of PCBs is ≈ in 40 times and in two places ≈ in 2 times.

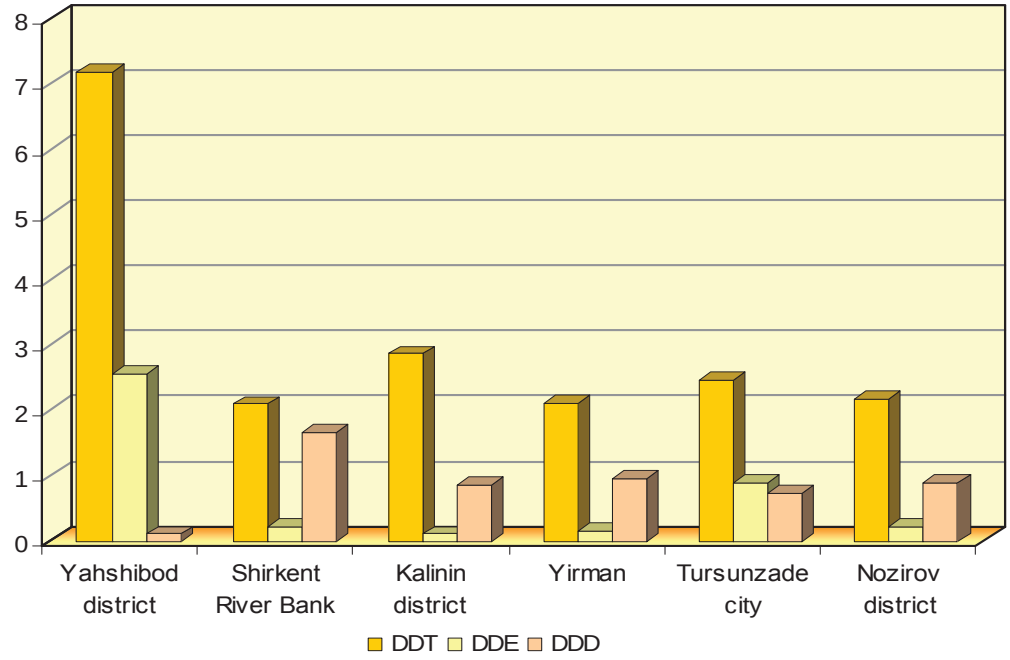


Diagram 2.3.5.1 Availability of DDT and its metabolites in soils samples (mg/kg) of Tursunzadeh district, 2005.

Analysis of these soils samples for availability of PCBs, as precursor of dioxins and furans, revealed the availability in four (from ten) di-, tri-, tetra-, penta and hexachlorbyphenils, the total number of which is in the limits of 0,02-2,3 mg/kg. Exceeding of relatively safe level of influence on the sum of PCBs is ≈ in 40 times and in two places ≈ in 2 times.

Burying of SMW in pesticides burial places is the main method of their removal. In Tajikistan there are 62 burial places for SMW. Total territory of burial places is 300 ha. However, the condition of these burial places often doesn't correspond to requirements of building and sanitary standards for such places. As a result, the spontaneous ignitions take place here constantly, leading to dioxins and furans formation. On preliminary calculations the dioxins and furans emission is about 3,5 g TE – 11% from total number of emission to atmosphere all over republic (2003). There are no in Tajikistan the system of selective SMW collection, waste incinerators and waste processing plants.

Special researches on POPs emissions in various territories (agricultural fields, dumps of industrial wastes and SMW, territories of industrial and agricultural enterprises and etc.) were never conducted in Tajikistan in former time, and also not conducted in framework of Project "Enabling Activities for the Development of a National Plan for Implementation of the Stockholm Convention on POPs in Tajikistan".

The are no special statements, regulations, instructions and methodical manuals on improvement of current situation on POPs and POPs-contaminated territories, due to newness of this issue in republic.

2.3.6. Brief information about future production, use and emission of POPs – requirements for exemption.

In Tajikistan were never produced pesticides, including POPs-related ones, PCBs and PCB-containing electro-technical equipment. As the Party of the Stockholm Convention on POPs, Tajikistan has the commitment on non-admission of these substances production in future. Use of POPs-related pesticides in agriculture was forbidden in period of 1970 – 1992.

In elaborated draft Statement of Government of Tajikistan, which is now under the consideration "About Measures on Implementation of the Stockholm Convention", the import of materials and PCB-containing equipment (transformers and capacitors) and POPs-related pesticides to Tajikistan is prohibited.

Use of PCBs in Tajikistan is limited by the number of containing PCBs in exploited electro-technical equipment, and on the moment of inventory this number was 67,4 tons (2003). In decommissioned transformers and capacitors, the PCBs availability is 14,8 tons, i.e. 18% of total number. Accordingly to Annex A, Part II

of Stockholm Convention, the stopping of use PCB-containing electro-technical equipment is planned to begin in 2007 with taking into consideration the approved schedule of stage-by-stage decommissioning and its replacement with alternative equipment. In this case, the main part of electro-technical equipment will be replaced by the year 2010. The effectiveness and completeness of this activity implementation depends on financial support, necessary for such kind of work, and on period of financial supply. Ecologically safe removal of PCBs and contaminated electro-technical equipment will be done by the year 2012, in case of appropriate financial support.

The total dioxins and furans emission varies dependently on industrial activities. Taking into consideration the fact that the main share of total dioxins and furans emission belongs now to production and processing of ferrous and non-ferrous metals (47%) and combustion of fuel in municipal sector and households (44%); and the increasing of dioxins and furans emission in nearest future will be stipulated, first of all, by growth if primary aluminum production. In 2006, the planned volume of primary aluminum production (category No. 2) is 470,0 thousand tons; it means that dioxins and furans emission in this category will be increased at 47%, i.e. it will be 16,45 g of TE. Dioxins and furans emission in category No. 3 (production of electric power and thermal energy) in nearest 5 years will be probably at the same level. In households, due to lack of electricity and natural gas, use of fire-woods, including guza-poya (cotton stalks), for heating of houses and cooking will be not reduced. So, in nearest years the dioxins and furans emission in this category will at the same high level. Dioxins and furans emission in category No. 4 (production from mineral raw materials) in 2006 will probably increase at 24% and it will be 0,15 g of TE. It is connected, first of all, with launching of cement production in new cement factory with use of “dry method”; the productive capacity of this factory is 150 thousand tons; it was built within Isfarinski Building Materials Factory (Isfara city, Sugd region). Also it is stipulated by increasing of cement production in Dushanbe Cement Factory to 300 thousand tons (2006) and more in consequent years. Nowadays, there is the reconstruction of this factory by support of “Inecon Group” Company of Czech Republic. During realization of project on modernization of this factory is planned to build a new kiln for transition to half-dry method of cement production and alternative combined fuel: solid municipal wastes + water-carbonic fuel + gas. In nearest perspective is planned the building of new cement factory in Shaartuzski district in Hatlon region with productive capacity 2500 thousand tons per year; and it will lead to significant increasing of dioxins and furans emission.

The calculated level of dioxins and furans emission, due to lack of information on sources of their emission, is understated: the level of dioxins and furans emission by non-approved combustion of wastes, by production in private sector and by combustion of medical wastes is not determined. Also, the data of dioxins and furans emission are understated due to lack of reliable information concerning volumes of combusted SMW in burial places and etc., i.e. in such categories, which are the most significant sources of unintentionally produced POPs. Creation in future the state system on dioxins and furans monitoring and special instrumental base will allow controlling of theirs formation sources and making the exact assessment of both their emission to environment and their availability if productions.

Besides of all above-mentioned, the great negative role plays the low level of understanding of ecological issues not only by population but also by governing structures. As a result, such situation may lead not to decreasing of dioxins and furans emission but, in contrary, to its increasing.

2.3.7. Existing programs on monitoring of POPs emission and their effects on health of peoples and environment.

In accordance with Article 11, Part I, the Parties should:

In frameworks of their abilities to support and/or realize the appropriate researches, monitoring and collaboration on persistent organic pollutants both on national and international level.

Establishment of reliable monitoring system, though it is not the direct requirement of Stockholm Convention, is the necessary condition for its implementation. Accordingly to Convention, the researches and monitoring should cover:

a) sources and emissions to environment;

b) POPs-availability levels in human organism and environment;

c) transmission in environment, “life cycle” and transformation;

d) effects and human health and environment;

e) socio-economical and cultural consequences;

f) reduction and/or cessation of emissions;

g) unification of methodologies on registration of sources and analytical methods on measuring of emissions.

In Tajikistan, the serious investigations on all above-mentioned aspects are not conducted. Results, received during initial inventory, in spite that they were limited, allowed to see the general picture on capacity of POPs monitoring system in Tajikistan and on problems, which should be solved immediately,

Ministry of Agriculture and Environment Protection and Ministry of Health have scrappy information about examination of soils and about pesticides effects on human health, conducted in 80th years of former century. These works were conducted on various grants, however, due to lack of inter-agency coordination and ordered system on collection and keeping of information, there is no any documentation on the results of these activities. Agency on Hydrometeorology within Ministry of Agriculture and Environment Protection realizes the monitoring of quality of atmospheric surface level, water and soil; but its laboratory don't conduct analyses on revelation of POPs-related pesticides and PCBs in the environmental components.

The current capacity on conducting monitoring is presented as obsolete laboratory and institutional structure of state analytical control, inherited after Soviet time. In those period worked departmental systems of monitoring and control in framework of various ministries; moreover, examinations were conducted by Scientific-Research Institutions within Academy of sciences and corresponding departments of sanitary-epidemiological control within Ministry of Health. Ministry is the responsible body for monitoring of health condition of population in Tajikistan, whose professional activities is connected with use of pesticides. Before 90th years, Tajik Institute of Hygiene and Epidemiology and Tajik Institute of Preventive Medicine within Ministry of Health of RT conducted certain works on revelation of residuals of pesticides, including organochloric ones, in foodstuff of vegetative and animal origin, in bio-substrates (breast milk), in surface and underground waters. Nowadays, such activities are not realized due to lack of appropriate technical equipment in existing laboratories.

Accordingly to Article 65 of the Law of the Republic of Tajikistan "About Nature Protection", all agencies on nature protection, on sanitary control, on control of safety in industrial enterprises and agencies on mountains control are responsible for observation of state control in sphere of environment protection. This Law gives the comprehensive rights to the agencies of state control, including rights on closure of enterprises, for violation of environmental legislation. In this Law is reflected the system of departmental and administrative control (Article 66) and social control (Article 67) in sphere of environment protection. In spite of lack in this Law the concrete POPs issues, in the Article 48 is specified following: "Use of chemical substances with long period of decomposition, which may negatively affect on human health and environment, is forbidden". In the Article 28 are fixed the requirements to the residuals of chemical substances in foodstuff, which are elaborated and approved by the bodies on sanitary control of Tajikistan on the base of documentation submitted by State of Agro-Chemical Service in Tajikistan and in accordance with international standards.

However, in the Laws "About Nature Protection", "About Safe Industry and Use of Pesticides and Agro-Chemicals", the principles and procedures of monitoring are not reflected; also there are no any requirements concerning necessity of completeness of information and conditions/rules of its distribution among interested juridical and physical persons. Formulation of above-mentioned principles is beyond the frameworks of these Laws and demands elaboration of special Law "About Environmental Monitoring" and appropriate normative documentation. Normative documents should include the provisions about adaptation and implementation of modern methods and systems on taking samples, statistical data processing and computerized modeling of environmental processes. By elaboration of National Monitoring Programs it is necessary to orient on international requirements on control of quality and comparability of data; also the National System should be included to the Global System of POPs Monitoring, which is now in stage of elaboration.

By elaboration of POPs Monitoring Programs it is necessary to take into consideration the fact that the requirements and capabilities on various POPs categories are various, and they demand the thorough and selective elaboration of normative base on every of them. Moreover, it is important to note that regular POPs monitoring is extremely complicated and expensive work. Accordingly to UNEP data, the full and regular monitoring of all 12 POPs is conducted only in 17 developed countries.

Special characteristics of monitoring realization include availability of analytical base, institutional structures and qualified personnel. In spite of the fact that tasks of monitoring on various POPs categories are different, it will be reasonable to implement them in framework of unique program, though the conditions of monitoring, places and frequency of taking samples may differ significantly. Consequently, it is necessary to consider the main problems on POPs monitoring capacity building with taking into consideration the separate approach to three POPs categories: pesticides, PCBs and unintentionally produced POPs.

POPs-related pesticides, and especially DDT, were used widely during Soviet period in agriculture and for malaria carriers' control. In spite of the fact, that their use was officially forbidden more that two decades ago, most probably that they are used in the country for various purposes illegally. Due to steadiness of DDT metabolites to the processes of natural decomposition, there is a serous threat of contamination of soils, underground and surface waters, and as a result – foodstuff. During initial inventory were revealed the serious negative effects of obsolete POPs-related pesticides due to their inappropriate keeping in storage facilities and two pesticides burial places. All these factors confirm the necessity of conducting monitoring on availability of POPs-related pesticides in environmental components, and including this task to the priorities on reduction of negative POPs effects in Tajikistan.

During Soviet period, to the problem of pesticides monitoring was paid rather great attention. In framework of departmental and scientific programs was conducted monitoring of availability pesticides in soils and foodstuffs. Hydro-geological Service conducted the regular monitoring of underground waters from wells in hundreds points all over republic and controlled physicochemical parameters of substances, which availability should be regulated. However, during last 10 years, in framework of state inspections and monitoring programs, the work on determination of availability POPs-related pesticides in various environmental components was not conducted.

Pesticides, (in particular DDT) differ from other POPs by relatively high indicators of maximum permissible concentration (for example: thousands times higher than for dioxins and furans); and this factor allows conducting of their analyses by use of existing in republic analytical equipment. This equipment and qualified personnel are in the V. I. Nikitin Institute of Chemistry within Academy of Sciences of the Republic of Tajikistan. That is why, it was reasonable on the first stage to use all existing capabilities. It will allow revealing of "hot spots" and preparing of base for establishment of monitoring system.

However, the data received in process of national monitoring might be not accepted by potential donors or other international institutions. Use of foreign certified laboratories is extremely expensive, and such approach may be used only as temporary or control measure. In this connection, it is necessary to find, as soon as possible, the appropriate financial support (may be used financing in framework of capacity building project) for equipping of existing republican laboratories in accordance with international standards and purchasing of modern analytical equipment and obtaining of certificate for central analytical laboratory of environmental agencies.

The next step should include rehabilitation of toxicological and agro-chemical laboratory system within Ministry of Agriculture and Environment Protection with their consequent appropriate equipping. Places and frequency of monitoring conducting will be specified during process of detailed inventory. The most intensive work should be conducted in districts with the highest indicators of pesticides use and in nearest territories of revealed "hot spots" (pesticides storage facilities, burial places and former agricultural air-fields).

For determination of potential pesticides effects on human health, it is reasonable to conduct researches jointly with environmental agencies and Ministry of Health on availability of pesticides in foodstuffs (both imported and produced in the country); also it is necessary to conduct the selective investigations on availability of pesticides in human organism (breast milk, fatty tissues), especially in peoples, related to the risk groups.

Problem of PCBs handling and the task on their monitoring were accentuated in the country only after signing of Stockholm Convention. Before and in the moment being, there is no in the country any special regulation on their use, utilization and destruction. During inventory was revealed, that in republic are exploited 12 transformers and 1930 capacitors, the volume of PCB in which is 67,4 tons.

By elaboration of schedule on decommissioning of PCB-containing electro-technical equipment, the special measures on analytical

control and reporting of enterprises should be taken into consideration. State analytical control may be realized during selective inspections in accordance with internal schedule on the base of received notifications about violations.

Solution of second task is aggravated by lack of control of PCB-containing waste materials in former time. The waste transformer oils were simply thrown away and seeped in soil of burial places, built for keeping of wastes from enterprises, in dumps and, most often, in uninhabited places. That is why, during conducted of detailed inventory, it will be necessary to pay special attention to revelation of such burial places and unapproved dumps.

Analysis of PCBs availability is rather complicated process; nevertheless, revelation of chlorine is the indicator of possible PCBs availability. That is why, it is reasonable to examine the industrial burial places and land plots, contaminated with oil products and, in case of receiving positive results, to conduct more detailed analytical works by using methods of fluid or gas chromatography. PCBs have significant potential for contamination soils, underground and surface waters; so, the positive results of monitoring on availability of POPs-related pesticides, may serve as indicator of PCBs availability. Moreover, in former time PCBs were used as stuff for pesticides production. Special attention should be paid to establishment of analytical base, in particular, to updating of measuring instruments, obtaining of appropriate standards and training of stuff.

Unintentionally produced POPs. From the technical point of view, monitoring and regulation of unintentionally produced POPs (uPOPs) is the most expensive and complicated process. The maximum permissible concentration of these substances is measured in picogram per kilogram of dry weight; moreover, various kinds of dioxins and furans differ on their toxicity in thousand times. For revelation of dioxins and furans, and especially for their identification in various objects, it is necessary to use the extremely expensive and complicated analytical methods – combination of gas chromatograph with mass-spectrometer of high solution. Price of one analysis may reach many hundreds of USD. Controlling of dioxins and furans emission during industrial processes is the more difficult process. Nowadays, the economical condition of Tajikistan will not allow establishing of analytical laboratory for revelation of dioxins and furans in environmental components. So, it is reasonable to consider all possibilities on establishment of regional scientific center on dioxins and furans issues, which will be supplied with modern chemical-analytical equipment.

Effective POPs controlling system in the country will be created on conditions that: POPs will be included to the list of forbidden chemical substances; ecological standards of their availability will be elaborated for environmental components (soil, water, sediments) and foodstuffs (maximum permissible concentrations for pesticides are available from Soviet period); changes and additions will be inserted to normative-methodical acts of Tajikistan in sphere of health care and environment protection in accordance with requirements of Convention.

2.3.8. Existing level of information, public awareness and training of appropriate groups. Mechanism of information exchange with other Parties.

The POPs problems are relatively new for Tajikistan, so one of the NIP purposes is providing of republican authorities, responsible for realization of state policy in sphere of health care and environment protection, and public community with appropriate information.

Information management in framework of NIP realization includes collection of data, their exchange, analysis, processing and preparation of special information for interested users and for dissemination of information and its regular publication.

The main users of information are:

- republican authorities, responsible for Convention realization;
- National Coordination Committee on POPs regulation in the Republic of Tajikistan (includes representatives of various ministries and agencies);
- local executive agencies;
- official structures of Stockholm Convention, Conference of Parties, international organizations;
- scientific and educational institutions;
- NGOs and public community.

Experts in sphere of environment protection, scientists and NGO representatives, thankful to their participation at international seminars, meetings, Conferences of Parties and other measures, created the good base for establishment of collaboration and information exchange in sphere of POPs inventory and monitoring with states, realized Stockholm Convention (Annex A 1). The established cooperation was used by elaboration of NIP, and it will be used

in further activity for receiving of administrative, financial and technical assistance in sphere of realization Action Plan on NIP fulfillment.

Mechanism on information exchange with other Parties of Convention became valid thankful to creation of effective international net of information exchange, including efforts of such international organizations as UNEP Chemicals, UNIDO, UND, international net on POPs and etc. The main task of development of information management is creation of program-technical complexes for collection, processing and keeping of initial data, including automatic control of their quality and strengthening of capacity of information-analytical centers.

2.3.9. Corresponding activities of non-governmental interested organizations.

In process of NIP elaboration, the NGOs and Project Coordinating Office conducted following activities:

- informing of republican governmental bodies and public community by means of conducting of information campaigns, seminars, conferences, "Round Tables", actions, theater plays, school competitions, mobile exhibitions and etc.;
- organization of informational programs – dissemination of booklets, calendars, brochures, placards; conducting measures with showing thematic films: POPs and their effects on human health and environment;
- preparation and demonstration of ecological video-films and their translation on Central and regional TV; conducting of telecasts on POPs and chemical safety;
- conducting of "Round Tables" on elaboration of suggestions and projects on public community involvement to the process of POPs control; on facilitation of access to the ecological information; and on establishment of information exchange with local, governmental, social and international agencies;
- publication in newspapers and magazines the information concerning POPs problems and methods of their solution;
- conducting of seminar-trainings for teachers of natural sciences (chemistry, biology, geography and etc) from secondary schools and lyceums;
- elaboration of training programs on POPs problems for students of higher and secondary educational institutions;
- in framework of agreement with republican social organization "Youth of 21st Century" and Youth Group on Environment Protection in Sugd region was elaborated and implemented the Program "Dissemination of POPs Problem among Youth of the Republic of Tajikistan"; there is special section in the portal www.caresd.net;
- in www.caresd.net portal is presented website www.pops.tj, created in the framework of project
- Tajik Association "Green Patrol", working in 25 districts of Tajikistan and translating in Sugd TV channel CM-1 the ecological telecast "Space (Kosmos)", prepared the special thematic telecast on POPs problems in the Republic of Tajikistan.

2.3.10. Review of technical infrastructure for assessment of POPs; relationship with international programs and projects.

Availability of technical infrastructure is the necessary condition for realization of NIP measures and conducting of POPs monitoring in Tajikistan. Nowadays, there is no the modern technical infrastructure in republic for solution of tasks of RT on realization of Stockholm Convention. Certain agencies, responsible for individual aspects of chemicals, including POPs, have some elements of such infrastructure, including obsolete laboratory equipment of various sensitiveness level and readiness for work. For example: all sanitary-epidemiological stations of Ministry of Health have chromatographs, produced in USSR: Tsvet-100, Tsvet-550, Tsvet-3006, Kristal-2000, and also the chromatographs of Czech production: Chrom-4 and Chrom-5. This equipment either completely dismantled or is in non-working condition due to lack of spare parts or standard chemical substances, related to POPs.

The Service of State Control for Nature Resources Use and Environment Protection and its Agency – Center of Analytical Control within Ministry of Agriculture and Environment Protection, is responsible for technical realization of measures on environmental control; also it implements the chemical-analytical works in framework of state tasks on environmental monitoring. This Center and its regional department (Hujand city, Sugd region) have gas and gas-fluid chromatographs with such technical parameters, which after reparation of this equipment and purchasing of certified standards of POPs-related pesticides, may implement the analyses on availability of chlorine-containing pesticides in soil, plants and foodstuffs.

Hydro-geological Service of Main Department on Geology within Government of Ta-

jikistan conducts regular monitoring of underground waters in wells for determination of serial physicochemical parameters and availability of controlled substances in water, used as drinking water and also for other purposes.

The above-mentioned agencies conduct inspections in framework of their authorities and capacities; however, the works on purposive determination of POPs-related chemical substances were never conducted in former time and are not implemented nowadays.

For conducting of monitoring on soils condition in framework of former Republican Scientific Organization "Tajikselhozhimia" was established the net of agrochemical laboratories, supplied with modern for those moment equipment; however, nowadays these laboratories are practically not functioning.

The relatively new and modern chemical-analytical equipment are in laboratories of V. I. Nikitin Institute of Chemistry. Following equipment of this Institute is in working condition: chromatographs (high-fluid, gas-fluid and gas one) of CHROM-4, CHROM-5, TSVET-550, TSVET-100 type; spectrophotometers of SHECORD-M-80 and M-40 types (Germany); SPEKTROMOM 204 (Hungary); Thermo Spektronic (India) and etc. In laboratories of this Institute works the qualified personnel.

Thus, on the first stage of NIP realization, the existing chromatographic equipment in laboratories of various agencies and institutions of Tajikistan allow conducting of monitoring of organochloric pesticides availability in various environmental components, in case if standards of these substances would be included to the register.

For determination of PCBs availability in environmental components are used predominantly following methods: gas-fluid chromatography with use of selective to chlorine-containing electron-seeking detector; combination of gas chromatography and mass-spectrometry of low definition; and for determination of planar PCB (No. 77, 81, 126, 169) should be used combination of gas chromatography with mass-spectrometry of high resolution. Purchasing of above-mentioned analytical equipment and mastering of methods will allow solving of any problem, connected with detecting of PCBs, regardless of matrix character (of the object).

Of a great importance is equipping of one of these analytical laboratories with chromato-mass-spectrometer for conducting of reliable analysis of dioxins and furans.

For conducting of monitoring on all POPs categories it is necessary to purchase certified standard samples and standard blends for identification and determination of examined POPs concentration.

In Tajikistan were never conducted any special researches on POPs-related chemicals' effects on human health and environment. In 1985, Tajik Institute on Hygiene and Epidemiology within Ministry of Health conducted works on revelation of pesticides residuals. Form chlorine-containing pesticides were examined only DDT and its metabolites and HCH on their availability in oils, dairy produce and breast milk of rural women. In 1991, Tajik Institute of Preventive Medicine within Ministry of Health conducted research on contamination of irrigation and surface (channel) waters, where DDT, its metabolites and HCH were revealed. In 2001, Ministry of Health of RT, WHO and German Federal Environmental Agency (UMVEL BUNDESAMT) conducted research on contamination of underground and surface water-sources with pesticides in 49 districts of republic. From POPs-related pesticides in examined objects were revealed following: aldrin, dieldrin, DDT and its metabolites. In Tajikistan, special researches/projects on these substances' effects on human health and environment were never conducted.

There are no direct provisions on support of BET and the cleanest technologies in environmental legislation of the Republic Tajikistan. But nowadays, the increasing number of enterprises in republic, taking into consideration economical and ecological profits from effectiveness of natural resources use and understanding the requirements of market and accepting public opinion on ecological condition of environment, realize the necessity of elaboration of ecologically safe instruments. In January 2006, former State Committee on Environment Protection and Forestry of the Republic of Tajikistan and Government of Norway concluded the contract on realization of Program "Clean Production", the purpose of which is the cost effective reconstruction of industrial enterprises and simultaneous improvement of ecological indicators of their work. Training Program of "Clean Production" is focused on profitability of industrial enterprises by means of reduction of water and power consumption, decreasing of contaminants emission and wastes, improvement of productions' quality and increasing of labor safety. In framework of

Program, the Norway specialists conduct training courses, including collaboration with system of environmental management, for workers of industrial enterprises in Tajikistan.

From November 2006, by financial support of Sweden Government (Sweden Agency on International Development), in Tajikistan is implemented the Project "Initial Study of SMW (solid municipal wastes) Management in Dushanbe City". The main purpose of project is improvement of SMW management, including rehabilitation of selective wastes collection, transportation, processing and their utilization in Dushanbe city and nearest districts; and also restructuring of sector on wastes management for increasing effectiveness of activity and standards of hygiene, commercialization and coordination of works of city's SWM authorities for achievement of financial and economical sustainable development. Project is intended for introduction of best methods of SMW management, including their processing (wastes processing enterprise), removal (burial places in accordance with international standards), destruction (plant for SMW combustion). Project realization will allow eliminating of uPOPs sources (dumps, SMW burial places) in the capital of Tajikistan.

Joining under the aegis "Initiative on Protection and Safety of Environment" (ENVSEC), OSCE, UNEP, UNDP and NATO launched in Central Asia the Project "Rapid Environment and Health Risk Assessment" (REHRA Project). The purpose of Project is establishment of working frameworks for collaboration in environmental sphere, with taking into consideration the trans-border issues; supporting of peace and harmony in the region by means of establishment of collaboration; and also reaching of sustainable development. Ferganskaya Valley, the key region ENVSEC, is the one of most important and densely populated regions of Central Asia with rich natural resources and sweet water reserves. This valley is spread on territories of Kyrgyzstan, Tajikistan and Uzbekistan. During examination of environmental condition in Ferganskaya Valley were revealed several "hot spots" – contamination of surface and underground waters, industrial and agricultural contamination, toxic and radioactive wastes and land degradation. These problems are considered from the point of view of national safety, especially with taking into consideration the high density of population and certain socio-economical issues.

REHRA Project is intended for advanced study, monitoring and control of emissions to the atmosphere, and harmful effects on public health from industrial objects located in Ferganskaya Valley. At the same time, the project is intended for strengthening on national and regional monitoring systems, plans and nets on risk management. Main purposes of project include following:

- implementation of rapid risk assessment for receiving the general information on risks for environment and human health, from selected objects, with taking into consideration the priority risks and measures on their reduction;
- rendering support and strengthening of national monitoring on industrial and ecological risks, and also rendering of scientific support by means of conducting specific and thematic training in the fields;
- determination of collaboration frameworks on ecological trans-border risks;
- involvement of population to the risks reduction.

In elaboration of project are used the internationally recognized definitions on admissible levels of harmfulness for environment, public health and risk thresholds.

As the objects of investigation were selected four districts of Ferganskaya Valley, bordering to nearest countries, and posed the transfrontier risk to environment and public health: ***Kanibadamski pesticides burial place (Tajikistan)***; storage facility for industrial wastes of Kadamjaiski Industrial Complex on antimony production (Kyrgyzstan); Haidarkanski Industrial Complex and its storage facility for industrial wastes (Kyrgyzstan); Ferganski Oil-processing Plant (Uzbekistan).

This Project is financed mainly by Nature and Territories Protection of Italy and Canada Funds. The term of Project implementation is from March 2005 to July 2006.

2.3.11. Revelation of population and territories under the threat of POPs effects. Evaluation of scales and significance of threat for peoples and environment, and also the social consequences for prevention of negative effects on workers and community.

POPs contaminate the environment as a result of their practical use as the target products – pesticides and PCBs, or as unintentionally produced POPs of certain technological processes and industries – dioxins and furans.

Nowadays, in Tajikistan, there are no sufficient data about levels of POPs effects on human health and on contamination of environmental components with these chemical substances.

The investigations in sphere of assessment risk of organochloric pesticides (OCP) and PCBs effects on peoples, working with these chemical substances, were never conducted in republic. Use of certain POPs-related pesticides was prohibited during period from 1970 to 1992; that is why, to make the assessment of their effects on health of workers, dealing with them, is nowadays practically impossible.

Till beginning of NIP elaboration in Tajikistan, there was no any information on dioxins and furans emission and quantitative data on their contamination of environmental components. So, in Tajikistan were not conducted any study on dioxins and furans effects on health of workers in enterprises, which are the sources of these POPs.

Presently, to make the assessment of dioxins and furans effects on health of workers in enterprises, which are the sources of these substances, is impossible because of following:

- the industrial processes with dioxins and furans emission to the working zone are not determined completely;
- lack of quantitative data on contamination of working places with dioxins and furans;
- during long period it is necessary it is necessary to conduct special observations and purposive assessment of health conditions of workers, including biological monitoring for receiving of data on human organism contamination; it will allow to determine the cause-effect relation between contamination of organism and extent of health loss;
- for assessment of dioxins and furans effects on public health, it is necessary to examine all pathological revelations in workers handling with these substances.

For assessment of POPs threat significance for human health, were chosen two objects: Tursunzadevski and Yavanski districts.

Tursunzadevski districts. Selection of this object was stipulated by the fact that on territory of Tursunzadevski district is located the State Unitary Enterprise “Tajik Aluminum Company”, which, accordingly to data of initial inventory, is one of the main sources of uPOPs (47% from total emission in Tajikistan). About 70% of population in this district live in rural locality, where as the energy source are used fossil fuel and bio-fuel, including guza-poya (cotton stalk), which relate to the second on its significance source of dioxins and furans in republic.

Electro-technical equipment, used in Tajik Aluminum Company, contains about 54% (44,0 tons) of PCBs from total volume in republic. The decommissioned equipment contains about 4,0 tons of PCBs, or 28% from total volume of PCBs wastes (14,4 tons) all over republic. Analyses of soils samples for PCBs availability showed following: in four samples from ten were revealed di-, tri-, tetra-, penta- and hexachloro-biphenyls, the total number of which is in the limits of 0,02-2,3 mg/kg. In two places, on the sum of PCBs was revealed the exceeding of the relatively safe level of influence in 2 and 40 times.

In former time and presently, Tursunzadevski district is the place of intensive agriculture. On its territory, cotton, rice, forage crops and vegetables are cultivated; also horticulture and viticulture are full-developed. The maximal pesticides use, and mainly DDT, was in 60th years; in average, it was in Tursunzadeh district about 19,0 and 15,0 kg of reactant, correspondingly. The main method of pesticides use, including POPs-related ones, was air-treatment, leading to contamination of environmental components: soil, water, silt, plants and etc. By the end of 80th years, the intensity of pesticides decreased significantly thankful to introduction of integrated system on pests control and use of more effective preparations.

In Tursunzadevski district, the systematic control of containment POPs pesticides in environmental components was never conducted. There are only scrappy data (for the period from 1985 to 1990) on availability of DDT and its metabolites and γ-HCH in soils and plants, which confirm the exceeding of their maximum permissible concentration in soils and agricultural crops.

In connection with the fact, that pesticides were used during long period (over 40 years), their components are available in the environmental components. Analyses of soils’ samples, taken in 2005 in defined points of Tajik Aluminum Company zone of influence, showed availability of aldrin, HCB, γ-HCH, DDT and its metabolites. Availability of chlordane, heptachlor, dieldrin and aldrin was lower than minimally detected level - 0,001 mg/kg. Availability of DDT in soils exceeded the maximum permissible concentration in the limits from 2 to 72 times (MPC = 0,1 mg/kg); the total availability of DDT and its metabolites varies from 0,56 to 9,87 mg/kg; the sum of HCH isomers – from 0,2 to 3,87 mg/kg.

Thus, Tursunzadevski district was selected for conducting of ecological-hygienic researches of possible negative POPs-effects on public health, as the territory exposed to influence of all POPs categories: pesticides, PCBs and uPOPs – dioxins and furans.

Yavanski district. As the second object was selected Yavanski district, on the territory of which is located "Tajikhimprom" Ltd. – the enterprise producing the chlorine-containing goods. Moreover, this district is the large producer of cotton raw materials.

Assessment of POPs-effects was conducted in vulnerable public groups (children and pregnant women) and in high risk groups, working and living in zone of emission POPs, with taking into consideration the national peculiarities in households and etc.

Determination of indicators for study of POPs effects on public health. Nowadays, about 30 various effects of POPs effects on human health and environment are revealed. POPs may cause: diseases of immune system, leading to asthma and diabetes, diseases of thyroid gland; syndrome of exhaustion; decreasing of mental abilities; various disorders in reproductive system and development of children; abnormalities in behavior; and oncological diseases.

The most vulnerable to POPs effects are fetus and newborns. Effecting of mother's organism, POPs are transferring to fetus and newborn via placenta and breast milk, causing various complications, including prematurely of fetus, mortinatality and etc. Agricultural production in Tajikistan is characterized by great involvement of women to technological process; it increases the risk of environmental negative effects on specific functions of female organism. High rates of mortinatality, miscarriages, congenital malformations and diseases of reproductive system – it is incomplete list of POPs effects consequences for people. Special anxiety is stipulated by data on health condition of children, who was born districts with high level of pesticides use, including POPs-related ones. The intensive use of pesticides was stopped by the end of 80th years of last century; however, POPs accumulated in environmental components are seriously harmful for public health.

Methods of investigations and results. As a control zone, was taken the Gornaya Matcha district, located in the north of republic (Sugd region). The inhabitants of this district are dealing mainly with cattle breeding, so they are not exposed to POPs effects. The conducted situation analysis, in accordance with state reporting form No. 12 of the Ministry of Health of the Republic Tajikistan, showed the increase of morbidity number in sphere of respiratory diseases at 13% in population of Tursunzadevski and Yavanski districts, in comparison with clean control zone of Gornaya Matcha district (Diagram 2.3.11.1).

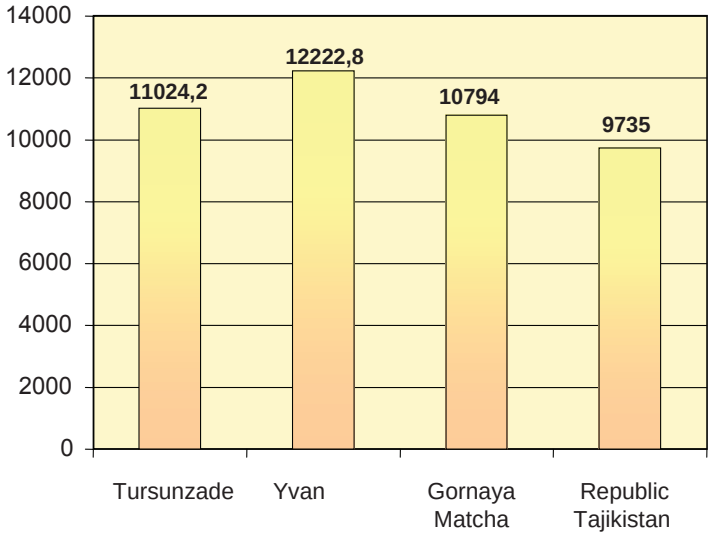


Diagram 2.3.11.1 Primary morbidity in sphere of respiratory diseases (per 100 thousand of population), 2004.

Analyses of data, presented by Republican Center of Medical Statistics within Ministry of Health, showed that in comparison with Gornaya Matcha district, in zones of higher risk of POPs effects, including effects on women's health, the number of miscarriages increases in 9,6-29,0 times (Diagram 2.3.11.2); number of premature infants increases in 1,7-2,6 times (Diagram 2.3.11.3); mortinatality increases in 3,7-3,8 times per 1000 of newborn (Diagram 2.3.11.4).

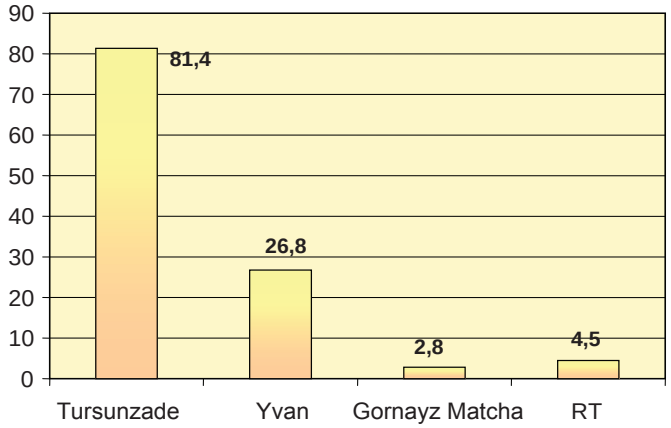


Diagram 2.3.11.2 Miscarriage per, 1000 of live-born, 2004

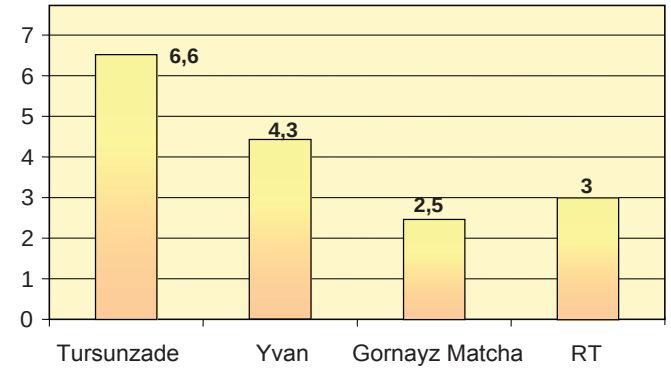


Diagram 2.3.11.3 Number of immature newborns in percent to the number of live-born, 2004

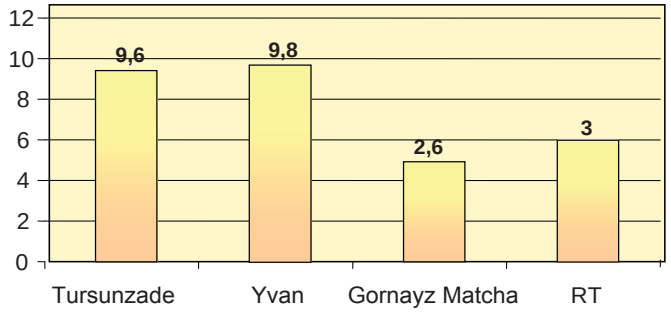


Diagram 2.3.11.4 Mortinatality per 1000, in percent to the number live and stillborn, 2004

The conducted study confirms the results of numerous works in sphere of POPs effects on reproductive health. In agrarian-industrial districts, to which Tursunzadevski and Yavanski districts belong, it is connected, in all probability, with influence of POPs, including POPs-related pesticides, and also with PCBs, dioxins and furans emissions.

Socio-economical aspects of POPs problem in Tajikistan. Tajikistan, as other countries in the world, is and will be during long time under the POPs effects, which have both indirect negative effects and direct positive influence in sphere of socio-economical situation in republic; and in any case it concerns every citizen in the country. The history of POPs use in Tajikistan is directly connected with development of agricultural, energy and other sectors of industry, and also the health care system. However, conducting of full-scale socio-economical assessment of POPs use is complicated due to lack of reliable statistical data, the main part of which was lost in the period of disorderly institutional reformations during first years of obtaining independency.

Ratification of Convention obliges Tajikistan to implement responsibilities, which will lead to concrete changes in the system of existing socio-economical relations. By the planning of all activities, it is necessary to take into consideration the fact, that Tajikistan is still one of the poorest countries in the world; so the obligatory intention of the National Plan should be conservation of sustainable development in the national economy and increasing of living standards of population in accordance with Poverty Elimination Strategy. The activities on Stockholm Convention implementation demand significant financial resources and thorough scrutinizing of various methods on Convention realization

for maximally effective use of these financial means. So, country priorities in NIP framework were chosen on the base of criteria, which may influence on social and economical situation both in short-term and long-term perspective.

The positive socio-economical effect of pesticides use is connected, first of all, with preservation of cotton raw materials, which is the main agricultural production of Tajikistan. Thankful to use of alternative methods in agricultural pests control, the DDT share decreased uninterruptedly from the beginning of 1970th, and the cotton-plant productivity was high till the collapse of USSR.

The special attention should be paid to use of pesticides in health care, where the social benefits from DDT use against malaria carriers were very high. In former time, the malaria mosquito combat by means of solid treatment of malaria zone with DDT helped to save the tens thousands of lives. The prohibition to use DDT for medical disinfection was implemented on the base of Order of the Ministry of Health of the USSR No. 138 from 2nd February 1989. However, the practically eliminated malaria in those times appeared once more in 1970th and reached the epidemic level at the end of 20th century.

In spite of the fact, that radical aggravation of malaria situation may be connected with various natural and social factors, and especially with its transferring from neighboring Afghanistan, the role of reduction or stopping of anti-malaria measures in last decades of former century should be not understated. Presently, malaria spreading is controlled by means of use the POPs-free preparations, delivered to the country as humanitarian assistance. So, in 2005, accordingly to data of Ministry of Health, were used 2376 kg of “solfac” and “triton” insecticides for anti-malaria treatment of near 10 millions m2. The terms of rendering assistance are limited, and in nearest future Tajikistan may face the threat of new epidemics due to lack of financial means for right time purchase of protective preparations.

At the same time, POPs properties predestine the wide diapason of interconnected negative effects with significant social consequences and, may be remote, economical consequences. The harmful substances effect directly on human health, change the soils characteristics, contaminate surface and underground waters and break the eco-systems balance. The possible results of their effect may be growth of morbidity (particularly: various types of cancer, disorders of endocrine system, miscarriages and etc.).

Generally, the negative socio-economical effects of POPs pesticides includes following components:

- deterioration and lowering of economical value of soils as a result of POPs contamination;
- contamination of water-reservoirs and lowering of water ecosystems’ productivity;
- increasing of concentration in foodstuffs due to POPs up-transition in food chain;
- negative effects on human health;
- increasing of economical expenses, connected with worsening of public health condition (payment for sick-list, reduction of labor productivity and etc.).

Determination of effects of exceeded pesticides concentrations on the economical value of soils may became an effective mechanism for stimulation of their use reduction. In several CIS countries were elaborated penalties for soils contamination. However, such penalties have empirical characters, so they cannot be used selectively concerning POPs in our country. Nowadays, there are no specific data for even approximate classification of soils in accordance with extent of their contamination with POPs.

On possible potential of POPs pesticides effects on human health, all population of the country may be divided into three main groups:

1. communities, which are prior for undertaking of special measures. To this category relates population of settlements, adjusting to places with higher concentration of POPs pesticides. They include large pesticides burial places, storage facilities, former agricultural air-fields and fields of agricultural enterprises, where in former time pesticides were used in extremely high volumes.

2. communities of potentially high risk. They include practically all rural population, involved to agricultural production, for which the higher volumes of pesticides use are typical (cotton growing and horticulture). The special anxiety is stipulated by the fact that majority of cotton-pickers are women (in accordance with existing data – about 80%);

3. communities of potential risk, connected with eating of foodstuffs and water with high concentration of pesticides. Practically all population of the country relates to this group, and first of all, it concerns the rural inhabitants.

Ecological-epidemiological analysis, conducted in Tursunzadevski and Yavanski district, revealed the significant growth of morbidity, which may be connected with POPs effects. These data differ greatly from results, received

in Gornaya Matcha district, where pesticides were practically not used. The average morbidity indicators, in particular connected with reproductive health, in contaminated districts differ significantly from indicators in Gornaya Matcha district and from average indicators all over the country. Such statistics confirms the great level of ecological problems in Tajikistan and necessity of conducting subsequent researches for revelation of communities, which are prior for undertaking of urgent measures. Revelation of such "hot spots" and determination of public risk groups is the task of detailed inventory.

PCB-containing electro-technical equipment was used in Tajikistan during long period; however, due to lack of information about PCBs toxicity, there was no any system of regulation of their use, utilization and destruction. On the same reason, there is no data on number of imported PCBs, number of their availability in environmental components as a result of escape or intentional replacement of waste materials, and also no data on extent of territories' contamination. Nowadays, in spite of long exploitation period, the majority of PCB-containing electro-technical equipment is functioning well and making profit.

It is considered, that potential effects of existing PCB-containing electro-technical on human health and environment cannot be compared with pesticides effects, because the PCB-containing systems are closed and technically isolated. The number of personnel, dealing with such equipment is approximately several hundreds peoples. Realization of Stockholm Convention demands significant financial and technical support for replacing of PCB-containing transformers and capacitors with alternative equipment, and also for establishment of infrastructure on their collection, transportation and ecologically safe destruction.

The unintentionally produced dioxins and furans, which are the side products of several technological processes, are not useful themselves; but the enterprises, which are the sources of uPOPs are often of a great importance for economical development of the country. In Tajikistan, there were not revealed enterprises, which are considered by Annex C of Convention as the large dioxins and furans sources; moreover, lack of reliable medical statistics for the last years is the serious obstacle for making any conclusions on risk assessment. The most significant social process, leading to dioxins and furans emissions, is domestic combustion of fuel (mainly, guza-poya - biological fuel), which, in accordance with calculations of initial inventory, is the source of 43% of these substances emission from their total number.

The principle variants of solution problem on removal of POPs-containing materials are following:

- safe removal and destruction of POPs-containing materials in existing of newly created industrial enterprises of the country;
- transportation/export of POPs-containing materials for their ecologically safe destruction.

Every of these approaches have their advantages and shortcomings; moreover, depending on results of technical-economical assessment, the combined variant may be accepted. In any case, solution of Stockholm Convention task on safe removal of POPs-containing materials implies the establishment of special infrastructure and import of high-tech and expensive equipment to the country; in its turn, it will lead to creation of additional working places and, to considerable degree, it will improve the ecological awareness of peoples and health of the nation.

2.3.12. Information about existing evaluation system and lists of new chemical substances.

Accordingly to Article 8, Tajikistan as the Stockholm Convention Party may give suggestions on inclusion of additional substances to the Annex A, B and C in accordance with requirements of Annex D.

In accordance with data, received during initial inventory of obsolete and forbidden pesticides, Tajikistan supports the suggestion of Mexico concerning inclusion of γ-HCH (lindan) to the list of chemical substances, regulated by Stockholm Convention, for discussion at the Conference of Parties. Accordingly to characteristics, prepared by Al-Union Scientific Research Institute of Hygiene and Toxicology of Pesticides, Polymeric and Plastic Mass, HCH is the medium-toxic (3rd class of harmfulness), harmful on its volatility extent and very resistant in the environmental components. In 1967, in republic were used about 11 thousand tons of γ-HCH on preparation (1,8 thousand tons on reactant); in 1991, γ-HCH consumption decreased in 8,5 times and became about 1,3 thousand tons on preparation (0,20 thousand tons on reactant). In 2006, about 3,0 tons of lindan (on preparation) were used for treatment of soils in Dangarinski district of Hatlon region. In spite of the fact that in 1986 technical HCH was forbidden for use; in 1987, limitations for use of 12% HCH dust were introduced by Ministry of Health of USSR; and in 1990, lindan was prohibited for use, in the

environmental components, including surface (channels) and underground waters, in soils, in fruits and vegetables, in meat and cow milk (in cattle-breeding production, the availability of γ-HCH is inadmissible), and also in breast milk the γ-HCH residuals were revealed (1995). There were cases of MPC. On the opinion of Mr. Zusovski - famous Polish scientist, availability of HCH in soils, even after its complete prohibition, will be revealed till 2050.

Chlordecon, suggested by European Union (EU) and its states, which are parties of the Stockholm Convention, for insertion to the list of chemical substances regulated by Convention, was never produced and used in Tajikistan as the agricultural pesticide. So, there is no data on its import, use and stocks. Nevertheless, if this preparation corresponds to all POPs criteria, Tajikistan as the Stockholm Convention Party will support of inclusion this preparation to the list of Convention.

In Tajikistan, there is no production of hexabrombiphenyls, suggested by European Union and its states, which are parties of the Stockholm Convention, and ether pentabrombiphenyl, and perfluoroctan sulfonate (PFOS) and 96 connected with PFOS substances, suggested by Sweden.

Tajikistan will support the inclusion of these substances to the list of new POPs in case if national experts will receive the information concerning places and types of their use in republic, qualitative and quantitative data about these substances emissions to the environment and other criteria, on base of which, accordingly to Item 6 of the Article 8 and Annex E, these substances will be included to the Annex A or Annex B of the Stockholm Convention. At the moment being, we have not such information.

Tajikistan, as the Party of Convention, will prepare the suggestions concerning inclusion of other substances, corresponding to POPs criteria and causing anxiety in the country, and also will fix appropriate obligations for elimination of these chemical substances.

2.3.13. Detailed data about existing assessment system and regulation of chemical substances, which are available in the market.

Appearance of pesticides in Tajikistan's markets should be officially registered by State Committee on Chemical Safety - special authorized state body, which was established on the base of Governmental Statement of the Republic of Tajikistan No. 92 from 3rd March 2003 and State Sanitary Epidemiological Station of the Republic of Tajikistan, functioning accordingly to Law of the Republic of Tajikistan "About Assuring of Sanitary-epidemiological Safety of Population" (2003). Registration is realized on the base of decision of experts' commission and on the results of registration examination of pesticides for the period of two years, and in future for 10 subsequent years. Registration may be abolished or suspended before the appointed period by revelation of new data on their harmfulness. For providing of consumers with information about safe pesticides handling, the juridical and physical persons, who apply for state registration of pesticides, are obliged to give appropriate recommendations on transportation, use and storing of pesticides, and also the label and precautionary marks. Delivery of hazardous productions (pesticides) to the markets of Tajikistan is realized on the permission of Ministry of Agriculture and Environment Protection and Ministry of Health.

Republican Center on Sanitary-epidemiological Control within Ministry of Health of the Republic of Tajikistan and its regional sub-divisions make selection of samples, including pesticides, sold in the markets for controlling of correspondence of productions (preparations) to their labels. Specification of production and its effects on agricultural pests and etc. are taken into consideration. The inspections are conducted in accordance with Law of the Republic of Tajikistan "About State Sanitary Control" (1994) and Statement about State Sanitary-epidemiological Control of the Republic of Tajikistan (2003). Juridical and Physical persons, dealing with packaging, labeling, storing and transportation of pesticides, are inspected accordingly to Statement about State Sanitary-epidemiological Service of the Republic of Tajikistan. By revelation of transgressions, the officials of Sanitary Epidemiological Service have a right to give special instructions, obliging these physical and juridical persons to implement them in appointed period. The reports of regional sub-divisions about such examinations are submitted to the Republican Center of State Sanitary-epidemiological Control within Ministry of Health. The checking of markets is conducted irregularly, mainly after receiving of negative information from consumers.

Chemical preparations for domestic use, before their delivery to the market, are controlled by the Agency on Standardization, Metrology, Certification and Trade Inspection within Government of the Republic of Tajikistan and Ministry of Health.

3. ELEMENTS OF STRATEGY AND ACTION PLAN OF THE NATIONAL IMPLEMENTATION PLAN

Chapter 3 includes two elements – official political statement and strategy of NIP. Political Statement reflects the commitments of Tajikistan on POPs problems solution, including official acceptance of NIP support. Strategy of implementation will include the exact action plans or strategies of implementation commitments on Convention and other additional purposes, determined by the country.

3.1. POLITICAL STATEMENT FOR SUPPORTING OF IMPLEMENTATION COMMITMENTS OF TAJIKISTAN ON REALIZATION OF STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS.

Participation in international agreements, regulating ecological aspects of the country in 21st century, is necessary for the sate for its coming-to-be progressive in national policy on achievement of Millennium Goals.

The Republic of Tajikistan, sharing the anxiety of international community, connected with POPs use, signed the Stockholm Convention on POPs in 2002 and ratified it the on 6th December 2006. Government of Tajikistan will conscientiously implement and undeviatingly observe all provisions of Convention.

NIP is the first national document on implementation of Stockholm Convention, and it is the officially approved approach to realization of commitments of the country. Plan includes the activities, based on Stockholm Convention provisions and legislation of the Republic of Tajikistan. In NIP are presented the strategic purposes of the Tajik Government and priorities on POPs problems solution on the national level.

Tajikistan, accordingly to its commitments on implementation of provisions and requirements of Stockholm Convention, is intended to decrease the negative POPs effects both on human health and environment till minimum, in accordance with time period fixed in Convention, and by availability of appropriate financial and technical means it may be done earlier.

This political statement is confirmed by NIP. Process of its implementation is based on active participation of national partners: ministries, agencies, scientific-research and educational institutions, community and mass media. Dissociation of their activity in sphere of POPs problems solution will be removed by planned working program.

For achievement of NIP purposes, Tajik Government, in the limits of its possibilities, will allocate financial and technical resources for its realization. The important condition for successful NIP realization is rendering of timely and appropriate technical and financial support to Tajikistan, which is the Party with economy in transition, taking into consideration the peculiar demands of country in sphere of capacity building and its strengthening for fulfillment of commitments on Stockholm Convention on POPs.

Participation of Tajikistan in the Stockholm Convention on POPs – it is the real step for integration of country to the process of international collaboration on elimination of these hazardous chemical substances.

3.2 STRATEGY OF IMPLEMENTATION.

This sub-section contains the description of activities specified in NIP on implementation of Stockholm Convention commitments, and also the coordination mechanism of certain NIP activities, including review, reporting, assessment and updating of NIP.

Table 3.2.1. Suggestion and priorities on implementation of development strategy and capacity building.

Suggestions and priorities on implementation of development strategy and capacity building	Responsible implementing agencies *
1	2
Establishment of National Center on Implementation of Stockholm Convention on POPs (NCSC). Giving to the National Center the coordinating and informational powers and functions in sphere of assessment projects and environmental measures in accordance with legislation of the Republic of Tajikistan on chemical substances management, and also in sphere of changing existing practice on decision making and acceptance of economical measures.	Tajik Government, MA&EP
Building of appropriate technological capacity for removal of PCB wastes, POPs-related pesticides, POPs contaminated wastes, and also contaminated soils and sediments	Tajik Government, MA&EP, ME&I, MH
Identification and assessment of POPs effects on human health and environment, based on criteria, standards and norms/limits, which are recognized on international level	Tajik Government, MH, MA&EP, Academy of Sciences, SSC

1	2
Conducting of research on alternative chemical substances	MA&EP, ME&I, MH, Academy of Sciences
Conducting of works on review, reporting, evaluation and updating of NIP.	MA&EP, ME&I, MH
Determination of commitments of national partners	Tajik Government, MA&EP, ME&I, MED&T

** См. Перечень сокращений и аббревиатур.*

The listed in the Table 3.2.1 committees, ministries, agencies and institutions are responsible for following components of NIP realization:

- development of national institutional and technical capacity for realization of NIP provisions; implementation of commitments on Convention, including its requirements, reporting, establishment of information exchange; assuring of full-right participation in Stockholm Convention as its Party;
- achievement of high level of awareness on POPs problem and steady devotion to implementation of NIP and commitments of Stockholm Convention by officials, responsible for decision making;
- achievement of high level involvement of public community and other interested parties in elaboration, updating and realization of NIP;
- capacity building for monitoring of POPs availability in environmental components and POPs effects on human health; inclusion of this issue to the National System of Environmental and Social-Hygienic Monitoring;
- establishment of base for timely financing of NIP measures by means of preparation package of suggestions concerning investments, technical assistance and capacity building for subsequent receiving of grants in framework of constant financial mechanism of Convention, with taking into consideration issues of co-financing in framework of financial possibilities, specified in strategy of collaboration; and also receiving financial support from other international sources.

During process of NIP realization, interested ministries, agencies and etc. will determine jointly the cost of every activity implementation in accordance with Working Plan.

3.2.1. Principles of implementation.

By realization of NIP measures, the special support will be rendered to implementation of following principles:

Public community involvement. Effective realization of Stockholm Convention on POPs with taking into consideration the establishment of inter-agency coordination on the national level. Such coordination approach is intended on collaboration of public community and interested partners on all levels of chemicals' management and assurance of chemical safety from side of responsible persons in industrial sector, interested labor and social collectives, and also NGOs.

Providing of public community with information.

Observation of internationally recognized criteria, standards and norms, acceptance of which will be possible only after detailed assessment of existing national standards.

Significant support will be rendered to the researches in sphere of chemical substances, *which are the POPs alternatives*.

General agreement on work will be reached on the base of determined commitments of national partners.

Timely implementation of obligations will help to avoid the introduction of special exemptions.

Determination of *economical effectiveness* of drafted Working Plan.

Taking into consideration *the real economical condition* of enterprises.

Observation of BAT and BEP principles.

In Tajikistan, the process of NIP realization will start in 2008.

NIP will add the existing national activities in corresponding spheres on the base of collaboration with interested ministries and agencies during conducting of detailed POPs inventory, collection and storing of POPs pesticides, PCB-containing equipment and their safe elimination. The appropriate conditions will be created for collaboration with other National Program Documents (National Action Plan on Environment and Health Protection, Strategy on Poverty Reduction, National Action Plan on Environment Protection) and international projects (Regional Action Plan on Environment Protection, Initiative "Environment and Safety" and etc.), and also for assuring of providing public community with appropriate information.

Plan of NIP realization will include following: determination of responsible ministries/agencies; terms of implementation; budget expenditures (cost of implementation); and probable sources of financing.

3.2.2. Approval of national priorities.

Conclusions on Phase III of the POPs Project, which were done during National Seminar on determination and approval of priorities, include the national priorities and approved purposes, recognized and approved by all seminar participants and members of National Coordination Committee on POPs in Tajikistan. The priorities include following:

- improvement of legislative and normative basis on POPs regulation in accordance with Stockholm Convention provisions and International Agreements. Purpose: harmonization of legislation in accordance with Stockholm Convention provisions, elaboration of appropriate legislation with taking into consideration the POPs reduction;
- strengthening of institutional capacity on POPs management - Establishment of National Center on realization of Stockholm Convention on POPs . The purpose is elaboration of national infrastructure for more effective management of POPs and POPs-containing wastes;
- establishment of laboratorial base in accordance with international requirements/standards. Purpose: strengthening of existing laboratories of Ministry of Agriculture and Environment Protection, Ministry of Energy and Industry and Academy of Sciences, or creation of new analytical laboratories. This purpose includes also the training on standardizations of methodologies and equipment;
- detailed inventory on all POPs categories and creation of system on monitoring and state statistic reporting on POPs (pesticides, PCBs, dioxins and furans) and similar to POPs substances. Purpose: conducting of detailed inventory on all POPs categories, establishment of appropriate national structure for effective management in sphere of safe handling and stage-by-stage reduction and eliminating of POPs;
- reduction of risk for public health and environment from POPs-containing pesticides. Purpose: preparation and conducting measures on revelation of sources of pesticides contamination (pesticides' burial places, storage facilities and agricultural air-fields), and also reduction of risk for peoples and environment from stored pesticides. Basing on results of researches and risks assessments, the technical measures on safe removal and elimination of pesticides in priority sources of contamination will be elaborated and implemented;
- conducting measures on eradication of malaria pest-holes by use of POPs-free preparations. The purpose of this priority is prevention of malaria outbreaks and epidemics without use of DDT and other preparations, related to POPs. Such approach will contribute to non-contamination of environment with POPs-containing substances;
- safe removal and elimination of PCBs and PCB-containing electro-technical equipment. Purpose: elaboration and implementation of technical measures on stage-by-stage removal of electro-technical PCB-containing equipment and its replacement with the alternative ones;
- study of unintentionally produced POPs effects on public health and environment. Purpose: determination of effects on human health in accordance with results of risk assessment and laboratory analyses; and also reduction of dioxins and furans emissions by means of BAT/BEP introduction, conducting of regular POPs monitoring;
- strengthening of informing process, awareness rising of policy makers, representatives of ministries, agencies and public community in all aspects of top-priority activities on POPs. Purpose: establishment of information exchange between interested ministries, interdepartmental committees in sphere of POPs regulations, and also between Convention Parties; conducting of POPs training programs (Manuals on BAT/BEP); increasing of accessibility of population to the Informational POPs Centers and all POPs-related information;
- Financial and technical resources.

The priorities were determined on the base of results of initial POPs inventory during Project Phase II. The main documents are presented in materials on conducted initial inventory.

Observation of principles on protection of human health and environment in all stages of POPs management, including study of chemicals' effects during their use; study of negative consequences; and inculcation of penalties for environment contamination – all these issues should be discussed with citizens, who has right to know and take part in the work of POPs management, and with all partners.

For solution of above-mentioned tasks, the following priority activities were determined:

1. 1. Elaboration and acceptance of Law "About persistent organic pollutants" in the Republic of Tajikistan. This Law will allow establishing the effective system on POPs

management in accordance with Stockholm Convention provisions and commitments of Tajikistan on this Convention implementation. This Law will be the foundation for elaboration of normative base in all sectors, which are dealing with issues of POPs turnover or their effects on public health and environment.

2. Establishment of National Center on Stockholm Convention on POPs realization within Ministry of Agriculture and Environment Protection of the Republic of Tajikistan. This Center will realize the management and interdepartmental coordination of all activities on implementation of Stockholm Convention provisions in Tajikistan. Its task will be controlling and evaluating of NIP realization and making decisions on its revision, updating and insertion of NIP elements to other national strategies, political solutions and plans. Functioning of Center will contribute to the capacity building and strengthening on Stockholm Convention implementation and to effective use of financial means, allocating from internal and external sources. In framework of National Center will function the information agency for assurance of appropriate exchange of POPs information. One of the tasks of this agency will be collection and processing of information concerning implementation of Stockholm Convention, and familiarization of policymakers, representatives of ministries and agencies with such information. Also, the functions of agency will include: organization of seminars for training of specialists in sphere of POPs problem solution; conducting of training for population; establishment of collaboration between National Center on Stockholm Convention and mass media and issue of press-releases. This agency will be the instrument of implementation commitments of Tajikistan on Aarhus Convention of UN European Economical Commission 1998 about Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters.

3. Re-packaging and elimination of obsolete and forbidden pesticides. Obsolete pesticides are storing in inappropriate conditions, without reliable isolation from population and environment. Practically all containers are worn-out and don't correspond to their functions; storage facilities are also in inappropriate conditions. As a result, the soil inside and around storage facilities contains high concentration of pesticides, and it is the serious threat for public health and environment. The existing system of registration and guarding don't ensure prevention of thefts and other kinds of escapes. It is necessary to conduct modernization of storage facilities, including re-packaging of pesticides and cleaning of neighboring territory.

4. Liquidation of potential threat for public health and environment by means of rehabilitative measures in Kanibadamski and Vahshski burial places of pesticides. For determination of risk's extent and selection of optimal method for liquidation of potential threat of pesticides burial places will be conducted special researches (geological, meteorological, hydro-geological, sanitary-hygienic with taking into consideration the risk for human health, environment and socio-economical situation), and also the technical-and-economic substantiation for conducting of rehabilitative works will be prepared. On the base of technical-and-economic assessment, the special project will be elaborated. The main direction of alternative activities is: liquidation of Kanibadamski and Vahshski pesticides burial places and/or appropriate isolation of buried pesticides (about 10,5 thousand tons, including 3,1 thousand tons of DDT) for the long period.

5. Eradication of malaria pest-holes by DDT alternative methods. Climatic conditions and geographic location of Tajikistan stipulate the uninterrupted conducting of anti-malaria measures in the regions of potential malaria spreading. Eradication of malaria pest-holes by POPs-free preparations demand conducting of expensive measures on the base of thorough planning, constant financing and international assistance. Observance of above-mentioned conditions will allow refusing of DDT use, even as exemption, for control of malaria carriers.

6. Replacement of electro-technical PCB-containing equipment with alternatives and its ecologically safe elimination. In accordance with Annex A, Part II of Stockholm Convention and approved schedule of stage-by-stage decommissioning and replacement with alternatives, the process of stopping use PCB-containing equipment will start in 2008 and complete by 2011. Effectiveness and completeness of these activities depend on availability of financial support for fulfillment of planned activities and right-time providing with appropriate financing. Ecologically safe removal of PCBs and PCB-contaminated equipment will be completed by 2013, in case of availability appropriate financial support.

7. Reduction of dioxins and furans emissions in industry and energy sector, as a result of implementation Best Available Technologies (BAT) and Best Environmental Practices (BEP). Use of BAT and ecologically safe practices is the key for solution of abovementioned issues, including reduction of dioxins and furans emissions and improvement of social problems of local communities. Implementation of BAT and BEP is very important for reconstructed and new enterprises, which are the sources of dioxins and furans emissions. It is necessary to conduct the researches concerning use of cotton-stalks (guza-poya) as a fuel, which is the source of dioxins and furans emission, and to find of alternative energy sources.

8. Solution of problems, connected with uncontrolled combustion of solid municipal wastes, by means of BAT and BEP introduction. Uncontrolled combustion of solid communal wastes and medical wastes, in accordance with international experience, is considered as the most significant source of dioxins and furans emissions to the environment. It is necessary to establish the strict system of registration solid municipal wastes and medical wastes all over the country and implement BAT and BEP for their elimination and utilization.

9. Elaboration of POPs monitoring system and establishment of chemical-analytical laboratory oriented on implementation of the Stockholm Convention requirements and accredited on the international level. BIn the process of NIP realization, the acute need in such laboratory will appear. The multilevel system of POPs monitoring should be establish practically anew on the base of existing institutions and infrastructure; the sectors of implementation should be determined and schedules of monitoring should be prepared. The important condition of this task implementation is providing laboratories with appropriate equipment and training of specialists.

3.2.3. Main principles of NIP realization.

NIP will add the existing national activities in corresponding spheres by means of collaboration with interesting ministries and agencies during conducting of detailed inventory of POPs, collection and storing of POPs pesticides, electro-technical PCB-containing equipment and their safe elimination. The appropriate conditions will be prepared for establishment of collaboration with other National Program Documents (Strategy on Poverty Reduction, National Action Plan on Environment and Health Protection and National Action Plan on Environment Protection) and International Projects (Regional Action Plan on Environment Protection, "Environment and safety" and etc), and also for public awareness raising.

For avoiding of duplication activities, specified in Action Plan and NIP strategies, and for assurance of their step-by-step implementation, it is necessary to determine the main principles of realization, which will help to coordinate the starting time and period of implementation, and also the distribution of financial and technical means.

Principles of realization of Stockholm Convention NIP:

- *inter-agency coordination on the national level:* coordination will be realized jointly with all interested partners with taking into consideration the responsibility for chemicals' management on all levels, and also with specialists on chemical safety issues, including representatives of industry, health care, agriculture and public community. Coordination of activity will be realized by National Center on Stockholm Convention within Ministry of Agriculture and Environment Protection;
- *information (data on POPs and their management):* the information will be collected and processed, especially in cases if it concerns the national or local situation or health of population and environment; it is necessary for making decisions and risk management with taking into consideration the local conditions;
- *main legislation and infrastructure:* it is necessary to strengthen the legislative, institutional / administrative and technical infrastructure for achievement of their adequate level. It will help to improve the control of implementation provisions of the Stockholm Convention on POPs;
- *reporting:* in accordance with Law of the Republic of Tajikistan "About Persistent Organic Pollutants", accepted on the base of existing procedures, the reporting should be observed. Both Ministry of Agriculture and Environment Protection and National Center on Stockholm Convention will be responsible for preparation of reports for the Secretariat of Convention;
- *POPs risks determination and assessment:* the assessment of POPs risks for human health and environment will be conducted.

As far as possible, the national standards and norms will be accepted;

- *risks management with taking into account the establishment of appropriate management:* this process will include all activities, connected with import / export, transportation, storage, use and elimination of POPs. Special attention will be paid to POPs pesticides and PCBs;
- *the work on revelation of most vulnerable public groups, subjected to POPs effects;* collaboration with public community involved to solution of POPs problems;
- *alternative chemicals:* the large-scale researches on POPs alternatives will be conducted;
- *conducting of NIP review, evaluation and updating, reporting;*
- *achievement of agreements with national partners.*

3.2.4. Mechanisms of the implementation strategy review.

The strategy on NIP realization includes the mechanisms of reporting and progress monitoring. It is a pledge of successful implementation of measures and controlling of effectiveness of used instruments.

Moreover, it is necessary to determine the interconnection of NIP results in whole and components of separate NIP parts. With this purpose, the terms and legislative and regulative measures of implementation of Stockholm Convention should be determined.

3.3. ACTIVITY, STRATEGY AND ACTION PLANS.

This section includes the list of strategies, activities and action plans with taking into consideration the necessity to improve situation on national level in sphere of realization Stockholm Convention on POPs.

Activity, strategy and action plans	Responsible executors
Legislative, institutional measures and measures on strengthening of regulations.	Government of Tajikistan, MA&EP, MH, ME&I
Reduction of POPs emission to the environment, including combustion of solid fuel, municipal wastes, fires and etc. Reduction of POPs effects on human health.	MA&EP, M3, ME&I, Municipal Service «Hojagii manzili komunali»
Liquidation of old stocks and used POPs chemicals (especially it concerns PCB-containing electro-technical equipment), their elimination by safe methods for environment and human health.	MA&EP, ME&I, MH
Introduction of BAT / BEP in future strategies on the industry development.	MA&EP, ME&I, MED&T
Collection of additional data, necessary for objective assessment of POPs stocks in individual economical branches.	MA&EP, ME&I, Municipal Municipal Service «Hojagii manzili komunali»
Optimization of monitoring programs of the ministries and agencies for realization of tasks, connected with Stockholm Convention implementation.	MA&EP, MH, ME&I, Municipal Service «Hojagii manzili komunali»

Plan of NIP realization includes: specification of responsible ministries/agencies; terms of implementation; budget expenses (cost of measures implementation), possible financial sources.

3.3.1. Activity: Legislative, institutional measures and measures on regulation strengthening.

This activity includes the improvement the existing legislation in accordance with the Stockholm Convention and insertion of provisions about creation of broad approach to the chemical safety in the country. This activity includes also the elaboration of special normative-methodical acts and manuals / handbooks for their practical use. The main element is the establishment of institutional collaboration in sphere of POPs problems solution all over republic and further dissemination of experience on chemical safety.

In Tajikistan, problem on chemicals, including POPs, is very serious. There is no in the country the appropriate legislation, specifying the activity of corresponding bodies (ministries, agencies and etc.) on implementation of POPs Convention, which should undertake the appropriate measures for achievement of Convention purposes. In Tajikistan, the success of Convention implementation depends on introduction of certain provisions to the institutional and legislative structure on chemicals' management in the country.

It is obviously, that the legislation of Tajikistan should be based on international provisions and norms, and it will be the foundation for timely and effective implementation of Stockholm

Convention on POPs. Implementation of Convention's provisions and conducting of POPs inventory on the national level should have the legislative basis, reflecting responsibilities of private and state institutions, enterprises and etc. For this purpose it is necessary to insert the amendments to the legislation of Tajikistan in accordance with Stockholm Convention on POPs or to elaborate a new law, the provisions of which will not only regulate the management of POPs pesticides, PCBs and PCB-containing equipment, which became wastes or are simply thrown to the environment, but also they should require the conducting of obligatory testing (during production or purchasing) for assessment of potential threat of chemical substances for human health by their emission to the environment.

In accordance with legislation of former Soviet Union, the substances listed in the Annex A (excepting PCBs) and Annex B of Convention (DDT use for medical disinfection was forbidden by the Order of the Ministry of Health of USSR No. 138 from 02.03.1989) were forbidden during period from 1970 to 1992. Thus, legislation of Tajikistan concerning chemical substances should be elaborated in accordance with demands of the country and requirements of Convention. As to unintentionally produced POPs, new legislation and regulations should be directed on reduction, and if possible, on complete elimination of emission POPs, listed in the Annex C of the Convention. Moreover, it is necessary to elaborate such regulatory mechanisms, which will allow assuring the flexibility by expansion of list of the forbidden substances accordingly to demands and conditions of the country.

In the light of above, the most reasonable way is the acceptance of law on POPs. New legislative provisions should be supported by special regulative measures: normative-methodical acts, statements and instructions and etc. for practical introductions of POPs legislation, i.e. to use it as the instrument of management.

For implementation of Stockholm Convention on POPs, the following work is necessary:

- establishment of National Center on implementation of Stockholm Convention on POPs (NCSC) within Ministry of Agriculture and Environment Protection;
- preparation of guidelines on POPs elimination problem with taking into consideration the advantages of non-combustion technologies;
- insertion to all corresponding guidelines the standards on POPs availability in sewages (risk for environment; contamination of food-chain; adaptation of methods on treatment sewages from industrial enterprises) and soils;
- introduction of limits on availability of dioxins and furans in wastes (gaseous, fluid and solid) and elaboration of norms for availability of POPs in other wastes;
- for prevention of "new hot spots" formation, it is necessary to fix legislatively the prohibition of POPs-containing wastes in dumps of industrial wastes and SMW.

In this section is given the description of suggested institutional structure with special emphasize on its potential; here is specified the necessity of involvement government to the long-term process on solution of issues concerning observation of legislation by means of establishment of constant body. For implementation of commitments on the Stockholm Convention it is necessary to arrange coordination between ministries and agencies, working with POPs problems.

For arrangement of effective coordination and collaboration with government and interested ministries and agencies it is necessary to establish NC SC within Ministry of Agriculture and Environment Protection (as the juridical person) and the expert net inside of the country. Its tasks will be following: arrangement of coordination between individual ministries, institutions and agencies, working on this problem; rendering support in implementation of Stockholm Convention on POPs; updating of national POPs inventory with regard to legislative provisions; control and evaluation of NIP realization; and making decisions on its updating. Other important task of NC SC is the insertion of NIP elements to other national strategies, political solutions and plans. Moreover, it will coordinate the activity on implementation of such international agreements as Stockholm Convention, Rotterdam Convention and Aarhus Protocol on Register of Toxic Chemical Substances Transmission with taking into consideration the establishment of collaboration, increasing of cost efficiency, transparency, improvement of reporting and mutual development.

NC SC should be the responsible link in the process of appropriate information collection, assessment of conditions for successful implementation, evaluation of progress activity and removal of obstacles for NIP realization. NC SC should establish the stable system of reporting and conducting of training for representatives of

all involved parties; it should submit periodically the reports on activity results to the Ministry of Agriculture and Environment Protection. NC SC will work with Secretariat of Convention and other agencies in sphere of information exchange (Article 9), conducting of international investigations and monitoring (Article 11), rendering of technical assistance (Article 12), providing of financial resources (Article 13) and observation of reporting requirements (Article 15, Annex A – Part II, Annex B, Part II, Article 5 (a)).

The main activity of NC SC should be focused on practical realization of ecological idea – work without frontier for "POPs-free Future" and on establishment of institutional base for realization of Tajikistan's commitments, as the Stockholm Convention Party. The principles of NCSC activities should be following: sustainability, transparency, professionalism, reliability, inter-agency collaboration and combination of program (development of programs on the state level – POPs monitoring, elimination of intentional POPs wastes, introduction of cleaner production for reduction of uPOPs emission, information and education, and etc.) and project approach in sphere of POPs management.

NCSC activity should be based on understanding of global harmfulness of POPs, which spread in spite of all political and administrative borders and departmental interests. It is necessary to create the appropriate conditions for collaboration with other international projects.

Ministries and other state institutions will be responsible for monitoring and evaluation of activities in their subordinated sectors. The received results will be included to the process of making corresponding decisions. The local authorities will be responsible for monitoring and evaluation of activities in accordance with their powers. Executive agencies of individual projects will be responsible for monitoring of their activity and for timely reporting.

Table 3.3.1.1. Action Plan on legislative, institutional and regulatory strengthening.

Measures	Responsible executors	Terms of implement-tation	Indicators of imple-menttation	Total (thou-sands USD)	Potential sources of financing
1	2	3	4	5	6
Improvement of legislative structure					
Elaboration and acceptance of Law about POPs	Govern-ment of RT, MA&EP	2009-2010	Statement of Majlisi Oli of RT about ac-ceptance of Law	20,0	International do-nor's assistance, republican budget
Changing of legislation of RT in accordance with requirements of Stockholm Convention: Cre-ation of normative-methodical base for POPs-chemicals man-agement, assuring prevention of duplication of activities and contradictions with provisions of Stockholm Convention on POPs; establishment of system on chemical safety. Consulta-tions with partners.	MA&EP, NCSC, ME&I, Ministry of Justice (MJ)	2009-2011	Package of normative legal normative and methodical docu-ments, approved by special authorized bodies. Protocols of partners' agreements	100,0	International do-nor's assistance, republican budget
Insertion to legislation the is-sues, connected with POPs elimination; specification of advantages of combustion-free technologies; elaboration of standards on POPs destruction, basing on principles of effective POPs elimination.	MA&EP, NCSC, ME&I, MJ	2009-2011	Insertion of Conven-tion provisions on POPs elimination to the national leg-islation. Package of documents, approved by special authorized bodies.	50,0	International do-nor's assistance, republican budget
Insertion to the legislation the issues concerning accumula-tion of hazardous wastes, in-cluding POPs-containing ones, in damps, burial places, stor-age facilities (new "hot spots"	MA&EP, NCSC, ME&I, Municipal Service «Ho-jagii manzili ko-munali», MJ	2009-2011	Insertion of Conven-tions' provisions on POPs-containing wastes to the legisla-tion of RT. Package of documents, ap-proved by special authorized bodies.	50,0	International do-nor's assistance, republican budget

1	2	3	4	5	6
Improvement of institutional structures					
Establishment of National Center on Stockholm Convention on POPs implementation (NC SC) within MA&EP with capacity, which can be used by Government for long-term period for solution of issues in sphere of POPs and other chemicals management.	Government of RT, MA&EP, MJ	2008	Statement of Government of RT about establishment National Center on Stockholm Convention on POPs implementa-tion and approval of NC SC provisions	100,0	GEF, international donor's assistance, republican budget
Arrangement of coordination in sphere of implementation of international commitments of Tajikistan on Stockholm and Rotterdam Conventions; and improvement of management in sphere of NIP realization.	MA&EP, MFA, NCSC	2008-2009	Working Plan of NC SC, Approved by Head of main authority. Establishment of coordination committees	150,0	International donor's assistance, republican budget
Rendering support to the Stockholm Convention implementation: training of personnel and infrastructure building (new equipment: computers and etc.), including conducting seminars and updating of national POPs inventory data by means of official regulation.	MA&EP, NCSC, MF and ME&I	2008-2012	Assessment of needs, elaboration of manuals, programs and plans	150,0	International donor's assistance, GEF, republican budget
Development of regulatory mechanisms					
Elaboration of recommendations on improvement of national policy on POPs and other chemicals management.	MA&EP, NCSC, ME&I, MJ	2008-2009	Instructions, technical documents; Register of POPs-containing wastes; Register of PVB-containing equipment.	150,0	International donor's assistance, GEF. republican budget
Introduction of legislative provisions on POPs in activity of administrative bodies.	MA&EP, NCSC, ME&I, MH, MJ	2009-2010	Normative-legislative acts, approved by specially authorized bodies	40,0	International donor's assistance, republican budget
Systematic updating of list on forbidden for use POPs.	MA&EP, NCSC, MH	Constantly	List, approved by authorized body (Committee on chemical safety)	15,0	Republican budget
Elaboration and introduction of norms on POPs containment in air, soil, water, foodstuffs and wastes (gaseous, fluid and solid).	MA&EP, NCSC, MH, ME&I	2009-2012	Norms, approved by MH of RT	50,0	GEF, international donor's assistance, republican budget
			Total:	**875,0**	

3.3.2. Activity: Measures on reduction and stopping of emission by intentional use.

In the Republic of Tajikistan, the agricultural pesticides, PCBs and electro-technical PCB-containing equipment were never produced. Nowadays, Tajikistan does not import on use the POPs-containing chemicals, excluding PCBs containing in electro-technical equipment, which is exploited in the moment being. Tajikistan, as the Party of Convention and in accordance with Article 3 of the Convention is obliged to accept the legislative and administrative measures, which are necessary for reduction and stopping use of chemical substances, listed in Annex A.

Table 3.3.2.1. Action Plan on reduction and stopping of emissions from intentional use.

Measure	Responsible executors	Terms of implementation	Indicators of implementation	Potential financial sources
Changing of Tajik legislation in accordance with requirements of Stockholm Convention	MA&EP, NCSC, MJ	2009	Introduction of Convention's provisions to the Tajik national legislation	International donor's assistance, republican budget
Reduction / stopping of POPs emissions from their intentional use	MA&EP, NCSC, ME&I	2011-2013	Recorded quantitative data about reduction of POPs emission from their intentional use	International donor's assistance, republican budget
Establishment of system on control of environmental components contamination with POPs in the regions with higher ecological risks	MA&EP, NCSC, MH	2010	System of control on state and departmental levels, approved by specially authorized body	International donor's assistance, republican budget
Prohibition of import and prevention of illegal import of chemicals, listed in Annexes A and B	MA&EP, NCSC, Customs Service	2008	Statement of Government of the Republic of Tajikistan	Republican budget
Elaboration and approval of rules on handling with obsolete and forbidden pesticides	MA&EP, NC SC, MH	2008-2009	Instructions, approved by special authorized body	International donor's assistance, republican budget
Destruction of POPs (pesticides and PCBs wastes).	MA&EP, NCSC, ME&I, MH, specialized enterprises	2010-2028	Documentation on destruction	GEF, international donor assistance, contribution of republic (budget and local investments)

3.3.3. Activity: Production, import, export, use, storage and wastes of POPs-containing pesticides, included to Annex A, Part I.

Stockholm Convention on POPs includes the prohibition of import and export of all pesticides, included to the Annex A, excepting the purposes of ecologically safe removal and purposes, which are listed as exemptions. In Article 3 of the Convention, Annex A, is fixed the full prohibition for production of aldrin, dieldrin, endrin, heptachlor and toxaphene. As the certain exemption, the production of chlordane, hexachlorobenzene and mirex may be allowed. Aldrin, chlordane, dieldrin, heptachlor, hexachlorobenzene and mirex may be included to the "Register for Certain Exemption". However, the certain exemptions for these chemicals will be invalid on 17th May 2009; but also they may be continued on the base of request of interested Party at the Conference of Parties. There is no any exemption for toxaphene and endrin, i.e. the work with them should be connected only with their ecologically safe removal. DDT is the separate preparation in this list, and to it should be paid special attention. If the Party is intended to use DDT for diseases carriers' control, it should:

1. register this purpose;

2. elaborate and implement the Action Plan with specification of following: use only for diseases carriers combat; introduction of alternative productions, methods and strategies on diseases control; reduction of morbidity cases.

The concrete exemptions for DDT will be invalid on 17th May 2009, but they may be continued on the base of request of interested Party at the Conference of Parties.

The initial inventory, conducted in 45% of pesticides storage facilities (167 from 372), functioned in republic at the beginning of 90th years of former century, showed availability of 1601,1 tons of obsolete and forbidden pesticides, about 4500 tons of pesticides and soils mixtures, which are located in storage facilities and on the adjusting territories. In storage facilities of Zafarabadski district of Sugd region and Gissarski district of RRS, there are 17,55 tons of DDT. In two pesticides burial places are buried 10,5 thousand tons of pesticides, including 3,1 thousand tons of DDT.

This NIP chapter was elaborated with taking into consideration the conducting of operative measures on removal of POPs pesticides – Annex A of the Convention. Institutional and regulatory measures were elaborated in accordance with statements, specified in chapter 3.3.1 and 3.3.2.

- *Table 3.3.3.1. Action Plan on liquidation of storage and wastes of POPs pesticides (Annex A, Part 1)*

Measures	Responsible executors	Indicators of implementation	Terms of implementation	Total cost, USD thousand	Potential financial sources
1	2	3	4	5	6
Organization of training for Working Group members in Sugd and Hatlon regions and RRS (40 specialists on plant protection) in sphere of detailed inventory methods with use of the newest standard FAO Forms	MA&EP, NCSC	Training program. Giving out of certificates on training completion	2008	30,0	GEF, international donor assistance, republican budget
Detailed inventory of inventory, including POPs-related ones: inspection of burial places for obsolete and forbidden pesticides, pesticides storage facilities and agricultural air-fields	MA&EP, NCSC	Working Groups reports	2009-2010	150,0	GEF, international donor assistance, republican budget
Identification of pesticides samples, taken during inventory of pesticides storage facilities	MA&EP, NCSC, Academy of Sciences	Data of analytical analyses	2009-2010	150,0	GEF, international donor assistance. republican budget
Identification of pesticides samples, buried in pesticides burial places	MA&EP, NCSC, Academy of Sciences	Data of analytical analyses	2009-2010	150,0	GEF, international donor assistance. republican budget
Processing of information on sources of POPs pesticides emission, including solution of issues on wastes and monitoring conducting	MA&EP, NCSC	Report, approved by NC SC	2009-2010	10,0	GEF, international donor assistance. republican budget
Updating of database on pesticides	MA&EP, NCSC,	Complete register on obsolete and forbidden pesticides, including POPs related ones (printed and electronic versions)	2009-2010	10,0	Republican budget
Building of new storage facilities for temporary storing of pesticides, which should be destructed; or use for this purpose the existing pesticides storage facilities after bringing them to accord with special standards	MA&EP, NCSC	Acts on storage facilities reception	2009-2010	250,0	International donor assistance, contribution of republic (budget and local investments)
Organization of training for representatives of 3 regions (40 persons) in sphere of repackaging and transportation of pesticides by means of safe environmental methods; conducting of consultations with partners and local authorities	MA&EP, NCSC	Written reports on training conducting (3 Training-seminars), minutes of consultations	2008-2009	125,0	GEF, international donor assistance. republican budget

1	2	3	4	5	6
Repackaging of obsolete and forbidden pesticides, including POPs ones and assuring of safe conditions for their storage till beginning of process on their destruction	MA&EP, NCSC	Acts on acceptance of work on pesticides repackaging	2009-2012	300,0	GEF, international donor assistance. republican budget
Assurance of safety during re-packaging and transportation of obsolete and forbidden pesti-cides and their mixtures, includ-ing POPs-containing ones	MA&EP, NCSC	Instruction, approved by special authorized bodies	Cons-tant-ly during work-ing process	150,0	GEF, international donor assistance. republican budget
Preparation of Technical-Economical Assessment for elaboration of optimal variants on destruction of obsolete and forbidden pesticides, including POPs related ones, and also POPs-contaminate environmen-tal components (on the base of BAT / BEP). Establishment of Working Group	MA&EP, NCSC, ME&I	Conclusions of Work-ing Group, agreed with interested Par-ties	2008-2010	20,0	GEF, international donor assistance. republican budget
Elaboration of program on de-struction of forbidden and obso-lete pesticides, including POPs-related ones, with taking into consideration time, place and method of destruction	MA&EP, NC SC	Programme, ap-proved by special authorized bodies	2009-2010	40,0	GEF, international donor assistance, republican budget
Transportation of repackaged pesticides to the place of de-struction on the territory of Tajiki-stan or abroad	MA&EP, NC SC	Acts on reception of pesticides wastes, prepared by organiza-tion of destruction	2011-2017	Cost depends on place of destructtion	GEF, international donor assistance, contribution of republic (budget and local invest-ments)
Destruction of forbidden and obsolete pesticides, including POPs-related ones, and their mixtures	MA&EP, NC SC	Acts on destructions	2011- 2017	500,0	GEF, international donor assistance, republican budget
Realization of complex measures on. Destruction of pesticides mixtures with soils and other substances, located in places for preparation of pesticides solu-tions	MA&EP, NC SC	Acts on destructions	2011- 2017	5000,0	GEF, international donor assistance, republican budget
Building / purchasing of enter-prise on destruction of forbidden and obsolete pesticides, including POPs-related ones	MA&EP, NC SC, ME&I	Act of State Commit-tee on reception of enterprise	2010-2015		GEF, international donor assistance, contribution of re-public (budget and local investments)
Conducting of complex ecological researches in pesticides burial places*, for elaboration of sug-gestions on their further function-ing or liquidation. Establishment of Working Group.	MA&EP, NC SC, MH, Head Geolog-ical Depart-ment within Government of RT	Report of Working, approved by special authorized body	2009-2010	150.0	GEF, international donor assistance, republican budget
Cleaning, rehabilitation, elimina-tion of storage facilities and soils, contaminated with pesticides, in-cluding territories of burial places	MA&EP, NC SC, MH	Acts on works com-pletion	2010-2014	Cost will de-pend on inven-tory results	GEF, international donor assistance, republican budget
			Total:	**7035,0 ****	

*** L. Complex ecological researches include following:**

- study of geological-hydrological conditions of land plots;
- renovation and construction of regime wells' net for control of underground waters;
- determination of possible ways of pesticides transition to the environment;
- analytical researches of eco-systems for pesticides availability;
- assessment of risks for public health;
- updating and organization of regular local monitoring in every burial place.

On the results of conducted researches, it is necessary to elaborate the program on burial places monitoring.

**** without taking into consideration the cost of:**

a) transportation of repackaged pesticides to the places of their destruction;

b) building / purchasing of enterprise on destruction of obsolete and forbidden pesticides;

c) cleaning, rehabilitation, elimination of storage facilities and soils, contaminated with pesticides, including territories of burial places.

3.3.4. Activity: Production, import, export, use, revelation, labeling, removal, storage and elimination of PCB (chemical substances, included in Annex A, Part II).

PCBs relate to POPs, included to Annex A of the Convention. Ratification of Stockholm Convention on POPs by Tajikistan means the strong responsibilities for undertaking measures on reduction of intentional production of all substances, listed in the Annex A of the Convention, including PCBs (Article 3). Import and export of all substances, included to Annex A of the Convention, should be forbidden, excepting purposes of ecologically safe removal and special exemptions.

In contrast to other POPs, the Stockholm Convention in its Annex A, Part II specifies the strong time-period for PCBs elimination and priority measures in dependence on quantitative indicators (volume and availability of PCBs in the equipment). Stockholm Convention requires stopping the PCBs use in equipment by 2025 – Annex A, Part II, Item (a); and ecologically safe destruction – not later than 2028 – Annex A, Part II, Item (e).

Moreover, in the Convention are specified the concrete technical measures for PCBs, such as obligatory labeling for all PCB-containing equipment. The priority measures include following: revelation, labeling and decommissioning of equipment in containing PCBs in concentration more than 10% in 5 liters tanks and higher 0,05% in more than 5 liters tanks (Annex A, Part II, Item (a), subparagraph i, ii, iii). If such equipment will be revealed, their owners, irrespective of property form, are obliged to withdraw and dismantle it. The purposes and priorities of Action Plan are elaborated on such way that rehabilitation of fluids, containing more than 0,005% (50 ppm) is not allowed, excluding cases of necessity when equipment should be repaired till its decommissioning. After 9th May 2007, i.e. after coming Stockholm Convention into force in Tajikistan, all PCB-containing electro-technical equipment should be considered as a waste. By conducting of detailed inventory, the additional number of non-functioning PCB containing electro-technical equipment may be revealed. In this case, the number PCB-containing wastes will increase. The management of revealed stocks should be realized by means of safe environmental methods.

The initial inventory showed the availability of PCB-containing transformers and capacitors practically in all regions of republic. However, the monitoring and registration of import of open, half-closed and closed equipment, including PCB-containing transformers and capacitors is not conducted on appropriate level. In accordance with initial inventory, in Tajikistan were revealed 13 transformers and 2743 capacitors, containing PCBs. The number of PCBs in this equipment is 82,2 tons. The territories, contaminated with PCBs, were not revealed during inventory, excepting small plots around equipment, which were contaminated due to depressurizing of transformers.

The suggested activity includes the measures on PCBs management both for short-term and long-term period with taking into consideration the implementation of commitments on Stockholm Convention. For prevention of import PCB-containing electro-technical equipment and materials to Tajikistan, and also re-export of such equipment from Tajikistan, the draft of Statement of Government of the Republic Tajikistan "About Measures on Implementation of Stockholm Convention on Persistent Organic Pollutants" was prepared. The elaborated reporting form No. 1 – PCBs will allow controlling of movement of PCB-containing electro-technical equipment and materials in enterprises, which use such equipment.

In accordance with commitments on Stockholm Convention implementation and ***by availability of appropriate financial resources***, it is planned to stop completely the use of PCB-

containing equipment by 2010, and to eliminate the PCB-containing wasted by means of safe ecological methods by 2012. In the same period, the obsolete electro-technical equipment should be replaced with the modern one.

The methods on elimination of PCB-containing electro-technical equipment may be divided into two categories: transformers and capacitors. To every category, the individual technologies of destruction should be applied. Transformers, containing oils of Sovol type, may be emptied, their metal parts may be washed (till PCBs availability in the water less than 50 ppm) and sent to the meltdown. Constructions, made from wood and poured out transformer's oil together with scourage, should be combusted by ecologically safe methods or destructed by chemical methods. Capacitors may be destructed wholly in specialized furnaces; also it is possible to dismantle the metal carcass after washing and burning and then to down melt it. The internal parts of capacitor (PVB-sodden paper, foil and cellophane) should be burned in incinerators for hazardous wastes.

The small quantity of revealed PCB-containing electro-technical equipment (2756 units) during initial inventory allow supposing that it will be mo reasonable to destruct it in the enterprises of other states (from the point of view of economical and ecological aspects).

Table 3.3.4.1. Action Plan on identification, labeling, transportation, storage and destruction of PCBs and PCB-containing equipment (chemicals, listed in Annex A, Part II).

Measures	Responsible executors	Indicators of implementation	Terms of implementation	Total cost, USD thousand	Potential financial sources
1	2	3	4	5	6
Changing of legislation of RT in accordance with requirements of Stockholm Convention	MA&EP, NC SC	Introduction of Stockholm Convention provisions to the national legislation of RT	2009-2010	10,0	Government of RT, GEF, international donor's assistance
Elaboration of normative requirements, regulating the turnover, exploitation, storage and elimination of PCB-containing electro-technical equipment and wastes	MA&EP, NC SC	Approval of normative-legal acts by the Government of RT	2008-2009	10,0	Government of RT, GEF, international donor's assistance
Elaboration of system on monitoring and control; register of PCB-containing electro-technical equipment	MA&EP, NC SC	System on management, monitoring and control, approved by specially authorized body	2009-2010	50,0	GEF, international donor's assistance, republican budget,
Prohibition of import / /export to and from RT the PCB-containing materials and equipment	MA&EP, NC SC	Statement of the Government of RT	2008	-	Government of RT
Conducting of detailed inventory of PCB-containing electro-technical equipment in accordance with sectoral principle	MA&EP, NC SC, ME&I	Reports of Working Groups	2008-2010	50,0	International donor's assistance, GEF, republican budget
Revelation and labeling of equipment, containing more than 50 ppm of PCBs	MA&EP, NC SC, ME&I	Register of electro-technical equipment, containing more than 55 ppm of PCBs	2008-2012	100,0	International donor's assistance, republican budget, GEF
Revelation of PCBs contaminated territories	MA&EP, NC SC, ME&I, Municipal Service, "Hojagii manzili communali"	List of territories with specification of contamination level	2009-2010	50,0	GEF, international donor's assistance, republican budget, local authorities
Examination of SMW dumps and industrial wastes dumps for availability of PCB-containing equipment	MA&EP, NC SC, ME&I "Hojagii manzili communali"	List of industrial dumps and number of PCB-containing electro-technical equipment on their territories. List of territories (m2)	2009	50,0	Donor's assistance, GEF, republican budget, local authorities, international

1	2	3	4	5	6
Identification of samples of transformer oil and soils on contaminated territories	MA&EP, NC SC	Documentary approved data of analytical researches	2009-2010	Will be determined after detailed inventory	International donor's assistance, GEF, republican budget
Updating of database	MA&EP, NC SC	Complete register of PCB-containing electro-technical equipment and materials (in printed and electronic version).	2008-2010	15,0	Republican budget
Elaboration of forms and procedure of obligatory reporting on PCBs)	MA&EP, NC SC, SSC	Statistic reporting form No. 1 – PCBs, approved by SSC	2008-2009	10,0	Republican budget
Labeling of PCB-containing electro-technical equipment.	Owners of equipment	Reports of enterprises	2008-2010	80,0	Finances of enterprises owning the equipment, republican budget,
Elaboration of schedule on stage-by-stage decommissioning of PCB-containing electro-technical equipment	MA&EP, NC SC, ME&I, owners of equipment	Schedules of decommission-ing, agreed with NC SC and approved by heads of enterprises	2008-2010	-	Finances of enterprises owning the equipment
Organization of temporary storage facilities for decommissioned PCB-containing electro-technical equipment and wastes till beginning of their elimination process	MA&EP, NC SC, ME&I	Approval of selected / fitted storage facilities by representatives of MH and MA&EP	2008-2010	50,0	Finances of enterprises owning the equipment , international donor's assistance,
Examination of storage facilities in enterprises and timely transportation of PCBs and PCB-containing electro-technical equipment and wastes for their elimination	MA&EP, NC SC, ME&I	Testing certificates	2008-2013	-	Finances of enterprises owning the equipment
Collection and transportation of PCB-containing electro-technical equipment and wastes to the places of temporary storing	MA&EP, NC SC, ME&I	Acts of reception of PCB-containing electro-technical equipment and wastes for storing	2009-2013	10,0	International donor's assistance, finances of enterprises owning the equipment, GEF
Preparation of Technical-economical assessment (TEA) on elaboration of optimal methods on utilization of PCB-containing equipment and elimination of PCBs wastes (on the base of BAT / /BEP principles). Establishment of Working Group. Consultations with partners.	MA&EP, NC SC, ME&I	Conclusions of Working Group. TEA, agreed with interested parties	2009-2010	20,0	International donor's assistance, GEF, republican budget
Building / purchasing of enterprises on utilization of PCB-containing electro-technical equipment and elimination of PCB-containing wastes, and also PCB-contaminated environmental objects / components (basing on BAT / BEP principles). Purchasing of devices on PCBs extraction from equipment with its subsequent washing and utilization.	MA&EP, NC SC, ME&I	Act of State Committee on reception of enterprise	2010-2013	Impossible to determine till making decision about place / enterprise, where PCB-containing equipment will be destructed	International donor's assistance, GEF, contribution of republic (budget and local investments)
Identification of new potential PCBs sources (taking samples and conducting analysis in specialized laboratory, assessment of results and elaboration of recommendations).	MA&EP, NC SC, ME&I	Updated list of sources	2009-2010	150,0	International donor's assistance, GEF, republican budget

1	2	3	4	5	6
Identification of new potential PCBs sources (taking samples and conducting analysis in specialized laboratory, assessment of results and elaboration of recommendations).	MA&EP, NC SC, ME&I	Updated list of sources	2009-2010	150,0	International donor's assistance, GEF, republican budget
Elaboration of plan on utilization of PCB-containing electro-technical equipment and elimination of PCB-containing wastes	MA&EP, NC SC, ME&I	Plan, approved by specially authorized body and direction of enterprises	2009	30,0	International donor's assistance, financial means of enterprises, republican budget
Replacement of PCB-containing electro-technical equipment with alternative one in accordance with development of enterprise	MA&EP, NC SC, ME&I	Plan, approved by specially authorized body and direction of enterprises. The acts on replacement.	2009-2011	The cost will be determined only after detailed inventory	International donor's assistance, financial means of enterprises, republican budget
PCBs transportation to the place of destruction on the territory of RT or abroad	MA&EP, NC SC, ME&I	Acts on PCBs reception by organization on destruction	2011-2012	Cost depends on place of destruction	International donor's assistance, financial means of enterprises, republican budget
Utilization of PCB-containing equipment and elimination of PCB-containing wastes	MA&EP, NC SC, ME&I	Acts on destruction	2011-2013	200,0	International donor's assistance, GEF, republican budget
Assessment of possible effects on peoples, biota and environment. Establishment of Working Group.	MA&EP, NC SC, MH	Assessment report of Working Group	2009-2012	150,0	International donor's assistance, GEF, republican budget
				Total:	**1035,0***

*** without cost of:**

a) replacement of PCB-containing electro-technical equipment with alternative one;

b) transportation of PCBs wastes to the place of destruction;

c) Building / purchasing of enterprises on utilization of PCB-containing electro-technical equipment and elimination of PCB-containing wastes.

3.3.5. Activity: Production, import, export, use, storage and wastes of DDT (chemical substances, included to Annex B), if they are used in the country.

DDT is not produced in Tajikistan, and from 1971 it was forbidden for use in agriculture as an insecticide. The issues concerning stocks and wastes of DDT and their possible use for combat against infectious diseases carriers were discussed in Chapter 2.3.3. By revelation of obsolete DDT stocks, which are kept by farmers, it is necessary to persuade them to return the forbidden pesticide for its ecologically safe destruction. The significant role in successful conducting of this action should play the local authorities and public community.

In Table 3.3.5.1 is presented the activity on adaptation of DDT management in the Republic of Tajikistan.

● *Table 3.3.5.1. Import, use, storage and wastes of DDT (chemicals of Annex B), if they are used in the country.*

Measures	Responsible executors	Indicators of implementation	Terms of implementation	Total cost, USD thousand	Potential financial sources
Updating of inventory data on import, use and storage of chemicals and their wastes, listed in Annex B (DDT)	MA&EP, MH, Customs Service	Updated database in printed and electronic version	2008-2009	20,0	GEF, international donor's assistance, republican budget
Establishment of system on management of data on chemicals, listed in Annex B (DDT)	MA&EP, MH	System on data management, approved by special authorized body	2010	15,0	International donor's assistance, republican budget
			Total:	**35,0**	

3.3.6. Activity: Register of concrete exemptions and necessary exemptions (Article 4).

In accordance with Article 4 of the Convention:

Any state, which became the Party, may register one or several concrete exemptions, listed in Annexes A and B on the base of written notification of Secretariat.

In Tajikistan, there is no the industrial potential for production of chemical substances, listed in Annex A and B of the Stockholm Convention. In future, their production and use is also not planned. In this connection, there are no reasons in Tajikistan for registration of special exemptions concerning chemical substances, listed in Annexes A and B, Article 4 of the Convention.

3.3.7. Action Plan: measures on reduction of emission as a result of unintentional production (Article 5).

In accordance with Article 5, the Parties of Convention are obliged:

As the minimum, to undertake measures, directed to reduction of total volume of emissions from anthropogenic sources of every chemical substance, listed in Annex C, for their constant minimization and, where it will be possible, complete elimination.

In Tajikistan, there are a lot of non-solved POPs problems; especially it concerns the assessment of dioxins and furans emission per capita and per m2. It is necessary, as far as possible, to intensify the process of revelation new uPOPs sources in the country and their study. It means that in Tajikistan should be improved the situation on dioxins and furans emission in accordance with international standards. In general, the main task is direct or indirect reduction of POPs emission to the environment; reduction of their availability in foodstuffs, in human organism, and also the public health protection.

The conducted initial inventory of uPOPs was very limited. It is supposes that in nearest 3 years, the emission of chemical substances, listed in the Article 5, Annex C of Convention (dioxins and furans) from anthropogenic sources cannot be reduced. Conducting of large-scale inventory of sources with great uPOPs emission will allow receiving of broader assessment of their emission to the environment. For receiving of reliable data on dioxins and furans emission, it is necessary to specify the details of uPOPs emission inventory, including detailed description of technological processes used in the enterprises; kind and volume of used raw materials; volume of production; type and effectiveness of treatment facilities exploited in these enterprises; kind, quality and quantity of used fuel; volumes of combustion / /destruction of wastes; indicators of emission factors and etc.

For conducting of detailed assessment it is necessary to cover such categories of uPOPs sources, which were nor examined during initial inventory:

- enterprises of non-ferrous metallurgy (Tajik Aluminum Company – burning of “green” anodes);
- enterprises of chemical industry (production of chlorine and chlorine-containing production);
- enterprises of hydrocarbon production (combustion of casing-head gas);
- coal production (spoil fire);
- enterprises of machine-building sector (smelting furnaces);
- enterprises of woodworking sector (combustion of waste wood);
- enterprises of food industry (smokehouses, installations for dried fruits production);
- medical facilities and veterinary services (combustion of medical wastes and died animals);
- motor-transport enterprises (utilization of various waste oils, tyres);
- dumps of SMW and burial places for industrial wastes (low-distillation combustion without system of control);
- small domestic ovens.

Elaboration of strategies on reduction of uPOPs emissions (on the base of BAT / BEP) includes following:

- creation of effective legislative and normative-methodical base in sphere of management uPOPs emissions to the environment;
- review of economical aspects concerning combustion of coal, bio-mass (in particular: guzapoya) in households. Assessment of dioxins and furans emissions showed that emissions from domestic ovens, in which these fuels are combusted, is 43,7% from total volume of dioxins and furans emission;
- continuation of works on identification and monitoring of possible POPs emission sources, including fires in SMW dumps, combustion processes during industrial operations, destruction of medical wastes and etc.;
- use of available information on inventory of emissions from such sources as small incinerators for medical wastes;
- profound description of republican regions with high level of POPs contamination of en-

vironment, including preparation of combined information about emission to the environment; it is necessary for elaboration of policy on reduction of emission from small sources, because the total volume of emissions from such sources is rather high.

During initial inventory, the assessment of soils and waters contamination with dioxins and furans was cont conducted. In spite of the fact that such activities are not included to the Stockholm Convention, these data are very important for planning of corresponding works. That is why; by conducting of complete inventory of dioxins and furans emissions to the environment it is necessary to specify the information on emissions of theses substances to the water and their residuals in foodstuffs and wastes.

For implementation of the Stockholm Convention provisions on dioxins and furans monitoring, it is necessary to conduct periodical analyses of emissions from industrial enterprises and other sources of these POPs. However, nowadays there is no in republic any laboratory on dioxins and furans revelation. Tajikistan has not sufficient financial capabilities for purchasing of such laboratory, the cost of which is about USD 1 million. In this connection, it is reasonable to establish the regional dioxin laboratory for servicing of several countries in our region (Afghanistan, Iran, Pakistan and Tajikistan).

Introduction of BAT and BEP in existing enterprises – sources of dioxins and furans is possible only by means of conducting modernization, based on analysis of used technological processes, types of raw materials, cleaning technologies for waste gases, and also improvement of workers' knowledge in sphere of BAT and BEP for these substances management. By consideration of suggestions concerning building of new facilities / enterprises (for example: building of aluminum and cement factories in Hatlon region) or significant modification of existing facilities / enterprises, the greatest attention should be paid to alternative processes, methods or practice in environmental sphere, assuring the prevention of dioxins and furans formation. By solution of these issues it is necessary to scrutinize the advanced experience of foreign countries and to find the modern technologies.

It is necessary to render support to the processes of training and improvement of professional level in accordance with strategies on Stockholm Convention implementation; every five years the strategies should be reviewed and their effectiveness should be evaluated.

Table 3.3.7.1. Action Plan on reduction of emissions from unintentional production of dioxins and furans (Article 5).

Measures	Responsible executors	Indicators of implementation	Terms of implementation	Total cost, USD thousand	Potential financial sources
1	2	3	4	5	6
Elaboration of normative-legislative acts in sphere of uPOPs management (dioxins and furans) in accordance with requirements of Stockholm Convention	MA&EP, NC SC, MJ	Documentation, approved by special authorized body	2009	40,0	International donor's assistance, republican budget
Creation of national monitoring system on dioxins and furans emissions	MA&EP, NC SC	National monitoring system on dioxins and furans emissions, approved by Government of RT	2009-2011	150,0	International donor's assistance, GEF, contribution of republic (budget and local investments)
Establishment of republican dioxin laboratory. Accreditation of this laboratory accordingly to appropriate procedures.	MA&EP, NC SC	Certificate on accreditation	2010-2013	2000.0	International donor's assistance, GEF, contribution of republic (budget and local investments)
Conducting of full assessment of uPOPs (dioxins and furans). Revelation of new sources of dioxins and furans emission, their identification.	MA&EP, NC SC, ME&I, Municipal Service "Hojagii manzili komunali"	Taking samples; analysis (laboratory control); updated register of uPOPs emission	2009-2011	150,0	International donor's assistance, GEF, republic budget

1	2	3	4	5	6
Receiving of more complete information concerning dioxin and furans emission in metallurgical sector, especially by production of initial aluminum and burnt anodes (burning of "green" anodes) in Tajik Aluminum Factory. Creation of Working Group.	MA&EP, NC SC ME&I, Academy of Sciences, Tajik Aluminum Company	Elaboration of research program – taking samples (laboratory control). Report on levels of dioxins and furans formation by production of initial aluminum and burnt anodes.	2009-2014	100,0	International donor's assistance, Tajik Aluminum Company, republic budget
Elaboration of annual register on dioxins and furans emissions	NC SC	Annually updated dioxins and furans register	yearly	30,0	International donor's assistance, republic budget
Elaboration of recommendations on implementation of BAT / BEP in reconstructed and new enterprises for reduction of dioxins and furans emissions. Creation of Working Group.	MA&EP, NC SC, ME&I	Report of Working Group with recommenda-tions on BAT / BEP implementa-tion in reconstructed and new enterprises.	2014-2018	100,0	International donor's assistance, contribution of republic (budget and local investments)
Elaboration of specific laws, methodical recommendations and normative documents on ecologically safe / appropriate management of medical wastes	MA&EP, MH, NC SC	Insertion of Convention's provisions concerning waste management, including medical wastes, to the national legislation	2008-2010	30,0	GEF, international donor's assistance, contribution of republic (budget and local investments)
Training of corresponding personnel of medical facilities (hospitals, inpatient clinics and etc.) and personnel responsible for medical wastes destruction in Dushanbe city, as the part of system on medical wastes management. Elaboration of training program.		Training programs for medical personnel, approved by special authorized body. Conducting of training seminars for medical personnel.	2008-2010	100,0	GEF, international donor's assistance, contribution of republic (budget and local investments)
Elaboration and inculcation of system on selective collection of medical wastes.	MH, MA&EP, NC SC	System on medical wastes management, approved by special authorized body. Implementation of approved system in Dushanbe city.	2010-2011	300,0	GEF, international donor's assistance, contribution of republic (budget and local investments)
Implementation on BAT / BEP to the process of medical wastes destruction for reduction of dioxins/ furans and other micro-pollutants emission. Establishment of enterprise for their destruction on base of BAT/BEP. Creation of Working Group.	MH, MA&EP, NC SC	Report of Working Group. Building of enterprise or installation of plant for destruction of medical wastes on base of BAT/BEP for reduction of dioxins and furans emissions. Act on putting into operation the enterprise / plant in Dushanbe city.	2010-2012	450,0	Contribution of republic (budget and local investments), GEF, international donor's assistance
Elaboration of measures on reduction of dioxins and furans emissions from small sources, including motor-vehicles, which influence significantly on total volume of emission. Creation of Working Group.	MA&EP, NC SC, ME&I, MT&C, Municipal Service "Hojagii manzili komunali"	List of measures, agreed with interested ministries and agencies.	2010-2012	30,0	International donor's assistance, contribution of republic (budget and local investments)
Supporting of education and training basing on the public awareness raising strategy, as the part of commitments on Stockholm Convention; review of strategy every five years for assessment of success in activity.	MA&EP, NC SC NGOs	Educational programs. Activity reports.	2008-2025	30,0	International donor's assistance, contribution of republic (budget and local investments)
			Total:	**3510,0**	

3.3.8. Strategy: measures on reduction of emission from storages and wastes (Article 6).

In accordance with Article 6, Paragraph (e), the Parties of Convention should:

make efforts for elaboration of appropriate strategies on revelation of territories, contaminated with chemical substances, listed in Annex A, B and C; in case of these territories rehabilitation, the works should be conducted by ecologically safe methods.

For reduction of POPs emissions from their storages and wastes, it is necessary to create the fundament for solution of problem, connected with POPs contamination in former years: database on "hot spots", old stocks, wastes and contaminated territories. Nowadays, there are no the appropriate methods of investigation and determination of real numbers of POPs wastes. Besides elaboration of project on inventory of stocks, used substances and wastes, it is necessary to determine the process of their elimination.

For further examination of territories to assess the risk and elaborate the suggestions on their rehabilitation (including insertion of new information to existing database), it is necessary to make the mapping of territories on level of POPs contamination, including sources of contamination (storage facilities, pesticides burial places and etc.).

The long storing of materials, containing any kind of POPs, is inadmissible even in dumps. They are the sources of ecological problems; it is necessary to undertake timely measures on prevention of possible contamination of environment. The storing of wastes in the open air should be stopped for prevention of POPs contamination of food-chain.

It is necessary to conduct inventory of sewage sediments in water purification enterprises for determination of POPs concentration; to elaborate the quality standards; to determine the technological priorities and parameters of decontamination; to conduct assessment of existing financial resources and need in them for implementation of systematic separation of industrial effluents from municipal sewages, this process is essential for prevention of possible POPs contamination of water, delivering to water purification enterprises.

Also, it is necessary to conduct investigations and elaborate new technologies on liquidation of POPs wastes and POPs contaminated materials.

For solution of problems, connected with POPs stocks and wastes, it is essential to find the appropriate financial resources.

Table 3.3.8.1. Action Plan on determination of stocks, used substances and wastes for assessment and management of emissions from stocks and wastes, containing pesticides, DDT, PCBs and unintentionally produced POPs (Chemicals of Annex A, B and C)

Measures	Responsible executors	Indicators of implementation	Terms of implementation	Total cost, USD thousand	Potential financial sources
1	2	3	4	5	6
Completion of work on creation of database on "hot spots", obsolete stocks, wastes and contaminated territories	MA&EP, NC SC	Database in printed and electronic version	2009-2013	15,0	International donor's assistance, republican budget
Elaboration of program on examination of places, including risk assessment. Elaboration of recommendations on rehabilitative measures.	MA&EP, NC SC, MH	Programmer, approved by special authorized body	2009-2011	150,0	International donor's assistance, GEF, republican budget
Mapping of territories on levels of POPs contamination, including sources of POPs contamination (storage facilities, burial places and etc.).	MA&EP, NC SC, ME&I	Maps of land contamination	2009-2012	175,0	GEF, international donor's assistance, contribution of republic (budget and local investments)

1	2	3	4	5	6
Elaboration of methodical manuals: on elimination of POPs stocks and wastes; on rehabilitation of contaminated land plots and monitoring of their condition.	MA&EP, NC SC, MH	Manuals, approved by special authorized body	2010-2013	30,0	International donor's assistance, republican budget
Elaboration of program on solution of problem, connected with contaminated territories, with taking into consideration the availability of appropriate financing	MA&EP, NC SC, MH, MF	Program, approved by special authorized body. Determination of financial sources	2011-2014	30,0	International donor's assistance, republican budget
Prohibition of keeping materials containing any POPs in dumps	MA&EP, NC SC, ME&I, MH, MJ	Normative – legislative documents, approved by special authorized body	2009	15,0	Republican budget, international donor's assistance
Support of conducting investigations and elaboration of new technologies, basing on principles of complete liquidation of POPs wastes. Determination of optimal method on removal (recycling – combustion – storing) of wastes. Creation of Working Groups	MA&EP, NC SC, Academy of Sciences, ME&I	Reports of Working Groups, approved by special authorized body	2009-2011	90,0	International donor's assistance, contribution of republic (budget and local investments)
			Total:	**505,0**	

3.3.9. Activity: management of storages and appropriate measures on treatment and removal of used materials.

Revelation of appropriate storage facilities for temporary storing of stocks.

Updating of existing information on safe management of stocks, including preparation of manuals on safe handling and destruction of stocks; and transportation of used substances to reliable storage facilities.

Elaboration of schemes and establishment of centers on collection of used substances.

- *Table 3.3.9.1. Action Plan on stocks management and undertaking measures on handling and destruction of used materials.*

Measures	Responsible executors	Indicators of implementation	Terms of implementation	Total cost, USD thousand	Potential financial sources
Identification of storage facilities, intended for temporary keeping of stocks	MA&EP, NC SC, ME&I, MH	List of storage facilities	2008	15,0	International donor's assistance, republican budget
Updating of existing normative-methodical base and information for assuring of safe stocks management	MA&EP, NC SC	List of normative-legislative documents, regulating the stocks handling, approved by special authorized body	2009	75,0	International donor's assistance, republican budget
Elaboration of manual on safe handling (transportation and safe storing) and destruction of stocks	MA&EP, NC SC	Manual, approved by special authorized body	2010	15,0	International donor's assistance Republican budget
Elaboration of schemes and centers on collection of used substances	MA&EP, NC SC, MH	Approved scheme of collection used substances; Establishment of center on collection of used substances	2010	15,0	International donor's assistance, republican budget, MH
			Total:	**120,0**	

3.3.10. Strategy: revelation of contaminated territories (with chemical substances, included to Annex A, B and C) and their ecologically safe management.

In accordance with Article 6, Paragraph (e), the Parties of Convention should:

Make efforts for elaboration of appropriate strategies on revelation of territories, which are contaminated with chemicals listed in Annexes A, B and C; during conducting of rehabilitative works should be used the ecologically safe methods.

Strategic NIP purposes in sphere of identification and management of territories:

- the base for identification and management of contaminated territories is conducting of thorough inventory in this spheres with subsequent analysis of ecological risks and assessment of needs for rehabilitation. It is necessary to make the economical assessment of such activities implementation;
- the thorough inventory of contaminated territories is also essential for prevention of further contamination due to leakage, evaporations or contamination of environmental components as a result of natural disasters, such as floods, torrents, landslides, earthquakes and etc., and for such situations should be elaborated special preventive measures;
- elaboration of assessment methodologies on contaminated territories with taking into consideration their current or potential effects on human health and environment; it will allow creating the rational and scientifically-founded method on conducting of comparative assessment of such territories all over Tajikistan. For assessment of contamination extent should be elaborated and approved the standards of contaminants' availability in environmental components (maximum permissible concentration of contaminants in soil, water and air);
- elaboration and approval of rehabilitative measures for identified contaminated territories;
- elaboration of manual on contaminated territories management, which should contain the strategy on contaminated territories management, including their identification and assessment, and also preparation and introduction of measures on their rehabilitation, and in particular:
  - determination of ways on reclamation of contaminated territories (elaboration of technologies on reclamation of POPs-contaminated lands):
    -- raising of upper soil's layer and its packaging in hermetic containers for
    --further transportation to the place of destruction of cleaning;
    -- biological reclamation of contaminated lands.
  - Determination of methods on contaminated soils destruction:
    -- organization of destruction in existing industrial enterprises in Tajikistan (Dushanbe Cement Plant);
    -- establishment of new enterprise for destruction of contaminated soils with taking into consideration its economical reasonability;
    -- export and destruction of contaminated soils to other countries (Russia, Germany, France, Switzerland and etc).
- elaboration of normative-legislative documents on contaminated territories management;
- training and improvement of professional level of personnel, working in sphere of contaminated territories rehabilitation;
- elaboration of Republican Program on inventory of contaminate territories with high risk for human health and environment. Determination of financial sources;
- determination of agency, responsible for regulation and management of contaminated territories.

3.3.11. Activity: revelation of contaminated territories (with chemical substances, included to Annex A, B and C) and their ecologically safe rehabilitation.

In framework of contaminated territories management it is necessary to conduct inventory of contaminated territories and assessment of ecological risk, and also the assessment of contamination extent and demand in finances for implementation of corresponding works. For reduction of potential risk of spreading contaminants from contaminated areas, it is essential to use the methods with taking into consideration the local situation.

Also, the appropriate measures should be undertaken for prevention of appearance new ecological problems by means of sanitary norms observation, improvement of legislation in sphere of POPs-containing wastes treatment (introduction of limits for their storing and combustion).

Table 3.3.11.1. Action Plan on identification of contaminated territories (chemicals of Annexes A, B and C) and their rehabilitation by ecologically safe methods

Measures	Responsible executors	Indicators of implementation	Terms of implementation	Total cost, USD thousand	Potential financial sources
Elaboration of normative-methodical documents on revelation of contaminated territories and their management	MA&EP, NC SC, MJ	List of normative-methodical documents, approved by special authorized body	2008-2010	100,0	International donor's assistance, republican budget
Elaboration of Republican Program on inventory of contaminated territories with high risk for public health and environment. Determination of financial sources	MA&EP, NC SC, MH, MJ	Program, approved by the Government of RT. The financial source is determined.	2009-2010	20,0	International donor's assistance, republic budget
Conducting of detailed inventory of contaminated territories. Revelation of territories contaminated with POPs (pesticides and PCBs).	MA&EP, NC SC, ME&I	List of contaminated territories. Level of contamination, availability of POPs in soils and sediments.	2011–2013	200,0	International donor's assistance, GEF, republican budget
Analysis of ecological risks and assessment of necessity in cleaning of contaminated territories / destruction of contaminated soils	MA&EP, NC SC, ME&I	List of contaminated territories, which should be cleaned urgently	2012-2014	40,0	International donor's assistance, GEF, republican budget
Selection of methods on rehabilitation of contaminated soils. Creation of Working Groups.	MA&EP, NC SC, ME&I	Recommendations of Working Group	2010-2011	15,0	Republican budget
Training of high qualified personnel, for rehabilitation of contaminated territories	MA&EP, NC SC	Establishment of training center. Elaboration of training program and conducting of training.	2012-2013	100,0	International donor's assistance, GEF, republican budget
Rehabilitation of contaminated territories accordingly to existing standards	MA&EP, NC SC	Acts on acceptance of works on rehabilitation of contaminated territories	2013-2020	It will be determined after elaboration of plans on rehabilitation	International donor's assistance, GEF, contribution of republic (budget and local investments)
Selection of methods on destruction of contaminated soils. Creation of Working Groups.	MA&EP, NC SC, ME&I, MH	Recommendations of Working Group	2009-2010	15,0	Republican budget
Destruction of contaminated soils	MA&EP, NC SC, ME&I, MH	Acts of acceptance of implemented works	2013-2020	It will be determined after elaboration of plans on destruction	International donor's assistance, GEF, contribution of republic (budget and local investments)
Prevention of new contamination of territories	MA&EP, NC SC, ME&I, MH	System of control on sanitary norms observation in sphere of POP-containing wastes treatment, approved by special authorized body	Constantly from the moment of control introduction	It will be determined after elaboration of control system	International donor's assistance, contribution of republic (budget and local investments)
			Total:	**490,0***	

*** without taking into account the following:**

a) rehabilitation of contaminated territories accordingly to existing standards;

b) destruction of contaminated soils;

c) prevention of new contamination of environment.

3.3.12. Activity: Facilitation and establishment of information exchange and involvement of interested parties.

For obtaining and use of reliable and rather full information by administrative agencies, it is necessary to elaborate the special system on

collection, storage, processing, treatment, analysis, and also the system on operative submission of results for decision-makers in convenient for them form. It is necessary to organize the information industry with capable infrastructure accordingly to above0mentioned requirements.

For effective chemicals' management, it is necessary to organize the information exchange process. The effective information exchange on POPs in Tajikistan will allow providing of all partners, involved to the process on chemicals' management and assuring of chemical safety on the national level, with appropriate data.

The necessary step for implementation of above-mentioned tasks is establishment of information centers for providing all interested parties in all regions of the country with information and for information exchange in regional and sub-regional level. For this purpose is planned following:

- establishment of National Agency on information exchange within National Center on Stockholm Convention (NC SC), which will be responsible for implementation of following functions:

1. elaboration and implementation of strategies on establishment collaboration in sphere of information exchange, its collection and dissemination;

2. subscription for internet-sites, containing information on national inventories and etc.;

3. supporting of existing informational mechanisms of NC SC and their introduction to other structures;

4. establishment of public relation for involvement of interested parties to the process of discussion problems concerning chemicals' management.

- appointment of National Coordinator on information exchange;
- determination of information, which may be exchanged;
- providing representatives of governmental structures, scientists, business and NGOs with corresponding information, such as data analysis, informational technologies and etc., by means of internet, publications, electronic magazines and etc.;
- purchasing and installation of equipment: computers, communicative technical means and etc. for organization of operative information exchange, including assurance of access to informational resources for scientists, public and other organizations;
- training of personnel in sphere of appropriate collection and dissemination of information, including involvement of public community;
- strengthening of national capacity on collection and use of multi-sectoral information;
- elaboration of training materials and programs;
- conducting of training.

Determination of partners' commitments:

- determination of appropriate partners and organizations;
- establishment collaboration with partners;
- information exchange with partners;
- involvement of partners to the work on program implementation.

Introduction of information exchange mechanism with other Parties of Convention will be possible by means of creation effective international net on information exchange. The main task of development in sphere of information management is establishment of program-technical complexes for keeping, processing and use of initial data, including automatic control of their quality, and also strengthening of informational-analytical centers' capacity.

Table 3.3.12.1. Facilitation of process on information exchange and involvement of interested parties

Measures	Responsible executors	Indicators of implementation	Terms of implementation	Total cost, USD thousand
Establishment of National Agency on information exchange within NC SC	MA&EP, NC SC, NGOs	2008-2009	55,0	International donors' assistance, republican budget
Training of personnel for obtaining new knowledge and skills	MA&EP, NC SC	2008-2010	15,0	International donors' assistance, republican budget
Strengthening of national capacity in sphere of collection and use of information from various sectors	MA&EP, NC SC, NGOs	2008-2010	20,0	International donors' assistance, republican budget
Determination of partners' commitments	MA&EP, NC SC	2008	-	-
Support of health care issues consideration	MA&EP, NC SC, MH, NGOs	2008- 2010	10,0	International donors' assistance, republican budget
			Total:	**100,0**

3.3.13. Activity: Public awareness raising, information and education (Article 10).

In accordance with Article 10 of the Convention:

Every Party, in the limits of its capabilities, should assure the access to information about persistent organic pollutants; support the awareness raising of its directive and administrative bodies in sphere of persistent organic pollutants issues.

The success of Stockholm Convention on POPs implementation in Tajikistan may be reached only if the public community will know about POPs problem and its effects on human health and environment. It is necessary to improve the process on constant public awareness raising by means of dissemination detailed information on POPs and training conducting. For this purpose the following should be done:

Preparation and introduction of program on public awareness raising on POPs issues:

- elaboration and publication of POPs-elucidative materials: brochures, placards, bulletins and etc.;
- organization of TV and Radio programs;
- preparation of articles and books for strengthening of process in whole;
- organization of practical seminars for vulnerable public groups.

Elaboration of policy and making decisions on awareness raising for officials, who are responsible for solution of POPs issues:

- selection of officials, responsible for political solutions and elaboration of policy;

Implementation of programs in sphere of public awareness raising:

- providing mass media with appropriate information;
- determination of reserve persons for realization of process on public awareness raising, including ministries, local administrative bodies and NGOs;
- training of reserve persons;
- establishment of collaboration with educational institutions, connected with solution of POPs issues.

Support of elucidative activities in sphere of POPs effects on human health and environment:

- presentation of information concerning advantages of POPs alternatives use;
- organization of TV and Radio broadcasts;
- elaboration of mini-grant program for public organization for public awareness raising in sphere of POPs problems.

Selection of POPs information:

- establishment of information center;
- elaboration of mechanisms for collection of information about POPs, included to Annexes A, B and C.

Support of process on dissemination of information:

- updating of web-site and issue of bulletins;
- support of process on preparation and dissemination of POPs information for ministries, agencies and other interested agencies.

Training of workers, teachers, technical and administrative personnel in corresponding institutions:

- organization of training for trainers;
- publication of training materials;
- conducting of practical seminars.

Table 3.3.13.1. Action Plan on public awareness raising, dissemination of information and education.

Measures	Responsible executors	Indicators of implementation	Terms of implementation	Total cost, USD thousand	Potential financial sources
1	2	3	4	5	6
Elaboration of program on public awareness raising	MA&EP, NC SC, Academy of Sciences, NGOs, IO	2008-2009	Program, approved by special authorized body	15,0	International donor's assistance, GEF, republican budget
Implementation of program on public awareness raising	MA&EP, NC SC, Academy of Sciences, NGOs, IO	2009-2010	Plan on public awareness raising	5,0	International donor's assistance, GEF, republican budget
Support of process on public awareness raising in sphere of POPs effects on human health and environment	MA&EP, NC SC, MH, Academy of Sciences, NGOs, IO	Constantly	Special information for mass media (printed, electronic), seminars, training and etc.	50,0	International donor's assistance, republican budget

1	2	3	4	5	6
Collection and processing of POPs information. Creation of Working Group on collection of information.	MA&EP, NC SC, Academy of Sciences, MH, NGOs	Constantly	Generalized information for public community and interested organization	30,0	International donor's assistance, republican budget
Establishment of process on dissemination of information	MA&EP, NC SC, NGOs	2008-2009	Seminars, "Round Tables", information in printed electronic mass media	80,0	International donor's assistance, GEF, republican budget
Training for teachers, technical and administrative personnel in corresponding agencies	MA&EP, NC SC	Accordingly to approved schedule	Schedule of training conducting. Reports about conducted training.	50,0	GEF, republican budget
			Total:	**230,0**	

3.3.14. Activity: research activities and monitoring (Article 11).

Article 11 of the Stockholm Convention on POPs:

Obliges the Parties, in the limits of their capabilities, to support and/or realize the appropriate scientific researches, monitoring and collaboration in POPs issues and when it is necessary, their alternatives and potential POPs, both on national and international level.

After conducting of initial inventory it was revealed that infrastructure and institutional potential for conducting of POPs researches and monitoring in Tajikistan are developed insufficiently.

In this Chapter, the planned activities in sphere of POPs researches and monitoring in Tajikistan are presented.

Capacity building in sphere of institutional structure and research of POPs problem.

- determination of institution, which have the potential for conducting of POPs researches;
- strengthening of national capacity in sphere of conducting scientific and technical researches, infrastructure on exchange of information and results of analyses;
- development of mechanism on establishment of collaboration between research institutions;
- elaboration of procedures on providing public community with information concerning investigations and development;
- conducting of researches on determination of POPs alternatives.

Inventory of corresponding laboratories for monitoring of all kinds of activities on POPs.

- preparation of list on existing laboratories;
- elaboration of criteria on assessment of these laboratories capacity for POPs analyses;
- conducting of assessment and selection of laboratories.

Modernization of laboratory / laboratories, which are capable to conduct the analyses of chemicals, listed in Annexes A, B and C.

Investigations in sphere of health care:

- monitoring and evaluation of tendencies of effects POPs (listed in Stockholm Convention) and chemical substances, which may be included to POPs list in future, on blood of pregnant women, breast milk and other human tissues;
- conducting of researches on assessment of potential POPs effects and risk for human health, with taking into consideration the food and with special attention to development of fetus and infants, whose development depends on breast feeding;
- conducting of researches, intended for reduction of POPs effects on reproductive health.

Investigations in sphere of environment protection.

- conducting of researches concerning environmental processes, which may influence on life cycle and spreading POPs and other chemical substances, which may be included to the POPs list in future;
- supporting of development new, improved technologies on revelation of POPs and other chemical substances, which may be included to the POPs list in future, in environmental components.

Determination of POPs concentration levels in environmental components:

- selection of methods on samples taking and analysis;
- conducting of samples taking;
- conducting of soils, air, water, breast milk and other biota components analyses for POPs revelation.

Improvement of data management process:

- data collection and monitoring with minimization of activities duplication;

- improvement of procedure on management of analyses' results;
- elaboration of manuals on processing of monitoring results and preparation of monitoring report accordingly to international standards.

Creation of mechanism on assuring of monitoring quality:

- establishment of effective system on control and quality assurance;
- establishment of committee on data assessment before their official acceptance.

● *Table 3.3.17.1. Researches and monitoring (Article 11).*

Measures	Responsible executors	Indicators of implementation	Terms of implementation	Total cost, USD thousand	Potential financial sources
Development of institutional and research capabilities in sphere of POPs management	MA&EP	2008-2009	Establishment of NC SC within MA&EP	500,0	International donor's assistance, GEF, republican budget
Creation of mechanism, assuring quality of monitoring on all POPs categories	MA&EP NC SC	2009-2010	National POPs monitoring system, approved by special authorized body	100,0	International donor's assistance, republican budget
Identification of appropriate laboratories for conducting of monitoring on all kinds of activities, connected with POPs. Creation of Working Group.	MA&EP Academy of Sciences, MH	2009-2010	Conclusions of Working Group	20,0	International donor's assistance, republican budget
Modernization of laboratories for conducting of analyses of chemical substances, listed in Annexes A, B and C	MA&EP NC SC Academy of Sciences, ME&I	2010-2013	Receiving of certificate on laboratory accreditation from Agency on Standardiza-tion, Metrology, Certification and Trade Inspection	1000,0	International donor's assistance, GEF, contribution of republic (budget and local investments)
Determination of POPs concentration levels in environmental components and biosubstrates	MA&EP NC SC MH	Constantly	Program on researches conducting. Schedule of samples taking. Officially recorded data.	500,0	International donor's assistance, GEF, republican budget
Establishment of appropriate data management	MA&EP NC SC	Every three year	Manual on data management (results and reporting). National registers	250,0	International donor's assistance, GEF, republican budget
			Total:	**2370,0**	

3.3.15. Activity: Assessment of efficiency (Article 16).

In Article 16 of the Stockholm Convention on POPs *is specified the requirement to Parties concerning elaboration of mechanisms on receiving of comparable monitoring data on chemical substances of Annexes A, B and C. Assessment should be done with taking into consideration the existing scientific, environmental, technical and economical data, including national reports.*

Assessment of efficiency of Convention implementation in Tajikistan:

- elaboration and assessment of program;
- elaboration of control table or forms for conducting of assessment;
- elaboration of national criteria on conducting of assessment.

Preparation of report on assessment results:

- mechanism of reporting;
- preparation of assessment report.

3.3.16. Activity: Reporting.

1. In Article 15 of the Stockholm Convention on POPs *is specified the requirement to the Parties concerning submission of reports to the Conference of Parties on effectiveness of undertaken measures. Moreover, every Party should submit to the secretariat the statistical data on total volume of production, import/export of every substance, listed in Annexes A and B with specification of countries, importing/exporting these substances. The report is*

the significant contribution to assessment of Convention realization effectiveness (Article 16); the report should be prepared not later than four years from the moment of Convention coming into force.

2. Report about measures, undertaken in framework of implementation of Stockholm Convention on POPs:

- list of measure, elaborated for implementation of Convention's provisions;
- elaboration of reporting format in accordance with Convention format;
- identification of software for submission of statistical report data and results of Stockholm Convention implementation.

3. Report on measures on reduction or stopping of emissions of intentional production and use of chemicals, listed in Annex A and B of the Convention.

Submission of reports on following issues:

- legislative/administrative measures on stopping production and/or use of chemicals listed in Annex A of Convention with specification of corresponding dates;
- legislative/administrative measures on reduction of import/export of chemicals listed in Annex A of Convention;
- measures on reduction of import/export of chemicals listed in Annex B of Convention.

4. Report on measures on reduction or stopping of emissions of unintentional production.

Submission of reports on following issues:

- Action Plan on identification and classification of emission of chemicals, listed in Annex C;
- implementation of Action Plan;
- difficulties and successes of implementation;
- assessment of measures on prevention of current emissions of chemicals from anthropogenic sources, listed in Annex C of Convention:
  - elaboration of assessment format
  - category of source;
  - annual emissions (in gram of TE) to the air, water, soil and their availability in foodstuff;
  - collection of data on current emissions;
  - collection of data on prevention of emissions;
  - data analysis and preparation of report;
  - review of strategies and success of their implementation in accordance with commitments of Article 5 of the Convention.

5. Report on measures on reduction emissions from stocks and wastes.

Elaboration of process on data collection and conducting of inventory on following:

- stocks of chemicals, listed in Annexes A and B of Convention with taking into consideration the type of chemicals, their volume, location and condition;
- production and substances, listed in Annexes A, B and C of Convention, which are used in current time or are available in wastes;
- conducting of training on use of inventory forms;
- data collection;
- data analysis and preparation of reports;
- report on legislative and/or administrative measures on waste management.

6. Report on progress in sphere of reduction PCBs use.

7. Report on information exchange.

8. Report on public awareness raising and education.

9. Report on researches, development and monitoring.

Report should include following:

- measures on support of researches, development and monitoring of POPs, including sources of emission to the environment;
- current situation and tendencies of POPs availability in human organism and environmental components in accordance with Article 11;
- elaboration of format for submission of results/reports;
- timely involvement of partners to the process of investigations and preparation of reports for National Coordinator in framework of elaborated format;
- preparation of reports for information centers, such as International Program on Safe Management of Chemical Substances;
- measures on dissemination of information in sphere of investigations, development and monitoring.

3.3.17. Activity: Technical and financial assistance (Articles 12 and 13).

For implementation of individual NIP activitiesб the significant financial and technical means will be necessary. Taking into account the sharp deficit of the republican budget, one of the most important conditions for successful NIP realization, together with guaranty of financial providing, is activation of work on attraction of investments, determination of national and international donors.

Thus, the most important conditions of successful NIP realization is adequate technical and investment support.

Government of Tajikistan needs in rendering of technical and financial support in following spheres:

- improvement of national legislative structure on solution of POPs issues, oriented on international legislation;
- elaboration of financial mechanisms for realization of planned measures;
- rendering support to NC SC in sphere of NIP realization, conducting of assessment and preparation of reports on NIP, establishment of coordination with other international projects and projects with bilateral financing;
- establishment of national information system (extended database with reliable and constantly updated information on POPs);
- strengthening of NC SC capacity in sphere of processing and submitting of data;
- elaboration of program on POPs monitoring in sphere of environment protection and health care;
- strengthening of capacity on reporting and analysis;
- rendering support in sphere of PCBs identification in electro-technical equipment and conducting measures on PCBs elimination;
- rendering support in sphere of identification, management and purification of POPs contaminated territories (storage facilities, burial places and air-fields);
- rendering support in revelation and assessment of new sources of uPOPs emissions;
- conducting of training for workers of industrial enterprises and farms;
- study of potential for implementation of planned in NIP measures;
- elaboration and introduction of programs on public awareness raising, basing on the principles “public community has the right to know and participate”.

For realization of planned measures on purification of contaminated territories, the Government of Tajikistan needs in international financial support on following aspects:

- providing with materials for re-packaging of obsolete pesticides;
- destruction of obsolete pesticides;
- utilization of electro-technical equipment and destruction of transformer oils containing PCBs and PCB-containing wastes;
- purification of POPs-contaminated territories / soils.

The Republic of Tajikistan relates to the states with economy in transition and, accordingly to Articles 12 and 13 of the Convention, it has the right on receiving technical and financial support. Implementation of commitments on Stockholm Convention on POPs in Tajikistan depends on receiving of appropriate assistance. For receiving of necessary financial and technical assistance for achievement of goals, connected with solution of global POPs problems, the following procedures should be fulfilled:

- assessment of technical needs;
- assessment of financial needs;
- determination of financial sources;
- preparation of written application for receiving of financial support.

GEF is the Financial Agency of the Stockholm Convention.

Table 3.3.18.1. Technical and financial assistance (Articles 12 and 13).

Measures	Respon-sible executors	Terms of implement-tation	Total cost, USD thousand	Indicators of implementation
Search of sources for rendering of technical assistance for successful implementation of Stockholm Convention	Government of the Republic of Tajikistan, MA&EP, NC SC	2008-2009	15,0	List of international and republican donors
Search of sources for rendering of financial assistance for successful implementation of Stockholm Convention	Government of the Republic of Tajikistan, MA&EP, NC SC	2008-2009	15,0	List of international and republican donors
		Total:	**30,0**	

3.4. RECOMMENDATIONS AND PRIORITIES IN SPHERE OF DEVELOPMENT AND STRENGTHENING OF CAPACITY.

In the Chapter 3.4 are specified the priority aspects for achievement of NIP goals on strengthening of existing potential. The priorities are based on commitments and national needs on the Convention realization.

The priority work is intended on identification of issues, where, in the first place, the capacity should be strengthened for complete realization of National Plan in accordance with requirements of Stockholm Convention.

In this Chapter are presented 11 priority issues concerning NIP realization:

1. improvement of legislative and normative

base on POPs regulation in accordance with requirements of Stockholm Convention, national and international agreements, conventions; and also elaboration of legislation with taking into consideration the reduction of POPs;

2. strengthening of national capacity on POPs management – establishment of National Center on implementation of Stockholm Convention on POPs;

3. establishment of laboratory base accordingly to international standards. The purpose is to strengthen the existing laboratories of MA&EP and Academy of Sciences or establishment of new analytical laboratories;

4. detailed inventory of all POPs categories and establishment of monitoring system and state statistics reporting on POPs (pesticides, PCBs, dioxins and furans) and POPs-like substances;

5. reduction of risk for public health and environment from POPs-related pesticides;

6. conducting of measures on eradication of malaria pest-holes by means of POPs-free preparations;

7. safe removal and elimination PCBs and PCB-containing electro-technical equipment.

8. reduction of unintentionally produced POPs emission by means of BAT/BEP introduction;

9. study of uPOPs effects on human health and environment;

10. strengthening of informing process, awareness raising of decision-makers, representatives of ministries, agencies and population on all aspects of priority POPs activity;

11. financial and technical resources.

The priority directions were determined on the base of national results of initial POPs inventory, conducted during Phase II Project. The main documents are presented in materials on initial inventory.

It is necessary to observe the principles on environment and human health protection in all stages of POPs management, including study of used chemicals' effects, study of their negative consequences, and introduction of payment for contamination.

3.5. SCHEDULE OF NIP IMPLEMENTATION AND MEASURES FOR SUCCESS ACHIEVEMENT.

In this Chapter are presented the summarized main purposes, specified in strategy, and also the concrete tasks, terms and indicators of NIP realization.

Liquidation of POPs wastes and reduction of their effects on human health and environment is the key purpose of NIP.

For achievement of assigned goals, the following tasks should be solved stage-by stage:

First stage of NIP realization (2008-2013):

- elaboration of legislative and normative base in sphere of POPs management;
- conducting of measures on eradication of malaria pestholes by means of POPs-free preparations;
- detailed inventory of POPs wastes (obsolete and forbidden pesticides, including POPs- and PCB - containing ones) and complete assessment of uPOPs (dioxins and furans);
- capacity building in sphere of appropriate management of medical wastes;
- decommissioning of PCB-containing electro-technical equipment and its replacement with the alternative ones;
- elimination of PCBs and PCB-containing electro-technical equipment;
- establishment of POPs monitoring system in framework of National Environmental Monitoring System;
- preparation of technical-economical assessment for determination of optimal method on removal/elimination of POPs wastes and pesticides and soils mixtures;
- elaboration of technical-economical assessment for conducting of works on appropriate remediation or liquidation of Kanibadamski and Vahshski pesticides burial places;
- public awareness raising on POPs situation in the Republic of Tajikistan.

Second stage of NIP realization (2014-2018):

- implementation of POPs monitoring system;
- elimination of pesticides wastes, excepting those, which are buried in Kanibadamski and Vahshski pesticides burial places;
- revelation of POPs contaminated territories;
- elaboration and realization of pilot project on rehabilitation of POPs contaminated territories;
- elaboration of recommendations on introduction of BAT/BEP in reconstructed and new enterprises of Tajikistan for reduction of uPOPs (dioxins and furans) emissions;
- public awareness raising on POPs situation in the Republic of Tajikistan;

Third stage of NIP realization (2018-2028):

- realization of measures on appropriate remediation or liquidation of Kanibadamski and Vahshski pesticides burial places;

- implementation of effective POPs monitoring;
- действующий эффективный мониторинг СОЗ;
- implementation of BAT/BEP in reconstructed and new enterprises of Tajikistan for reduction of uPOPs (dioxins and furans) emissions.

3.6. RESOURCES REQUIREMENTS.

In Chapter 3.6 are presented the detailed supposed costs on implementation of NIP measures.

Table 3.6.1. Cost of NIP measures implementation.

№	Category of problems	Cost in USD thousands
A	Legislative, regulatory and institutional activities.	875,0
B	Obsolete and forbidden pesticides: liquidation of stocks and wastes of POPs-related pesticides (Annex A, Part I), including destruction of pesticides and their mixtures with soil and other substances.	7135,0 *5500,0*
C	PCB-containing electro-technical equipment; identification, labeling, transportation, storage and destruction of PCBs and PCB-containing equipment (chemicals, listed in Annexes A, Part II), including destruction of PCB.	1035,0 *200,0*
D	Reduction of emissions from unintentional production of dioxins and furans (Article 5).	3510,0
F	Determination of used substances stocks and wastes for assessment and management of emissions from stocks and wastes, containing DDT, PCBs and uPOPs (Chemicals of Annexes A, B and C).	505,0
G	Management of stocks and undertaking of appropriate measures on handling and elimination of used hazardous materials.	120,0
H	Identification of contaminated territories (chemicals on Annexes A, B and C) and their rehabilitation by safe environmental measures.	490,0
I	Rehabilitation / liquidation of pesticides burial places.	5000,0
J	Researches, development and monitoring.	2370,0
K	Elaboration of policy on public awareness raising on POPs issues.	230,0
L	Facilitation and establishment of information exchange and involvement of interested parties.	100,0
M	Technical and financial assistance (Articles 12 and 13).	30,0
	Total:Including POPs elimination:	**21400,0*** *5700,0*

*** without cost of:**

a) transportation of pesticides to the place of destruction;

b) purification, rehabilitation, liquidation of storage facilities, soils contaminated with pesticides, including territories of burial places;

c) building/purchasing of enterprises on destruction of pesticides, utilization of PCB-containing electro-technical equipment and destruction PCBs wastes on the base of BAT/BEP;

d) transportation of PCB-containing electro-technical equipment to the place of destruction;

e) rehabilitation of contaminated territories in accordance with existing standards;

f) elimination of contaminated soils;

g) prevention of new contamination of environment.

A. Capacity builoling on realiration of Stockholm Convention on POPs - legislative, institutional and regulatory activities

№	Category of problems	Cost in USD thousands
1	Elaboration and acceptance of Law on POPs.	20,0
2	Adaptation of legislation in accordance with provisions of Stockholm Convention on POPs.	100,0
3	Creation of normative-legislative base for effective management of chemicals in accordance with provisions of Stockholm Convention on POPs.	100,0
4	Modification of institutional structure. Establishment of National Center on implementation of Stockholm Convention on POPs. Arrangement of coordination in sphere of implementation of international commitments of RT. Supporting of Stockholm Convention implementation.	400,0
5	Development of regulatory mechanisms. Introduction of legislation on POPs to the practice and administrative structures.	255,0
	Total:	**875,0**

● *B. Obsolete and forbidden pesticides*

№	Category of problems	Cost in USD thousands
1	Training of Working Groups on procedure of pesticides inventory.	30,0
2	Inventory (examination of remained 54 % of storage facilities, which were not covered by initial inventory).	150,0
3	Identification of pesticides' samples, taken by inventory, processing of information, updating of database.	320,0
4	Building of new or modernization of existing storage facilities for temporary keeping of pesticides.	250,0
5	Training of Working Groups on procedure of pesticides re-packaging.	125,0
6	Re-packaging of obsolete and forbidden pesticides and their transportation to the place of temporary storing; assurance of safety during re-packaging and transportation.	450,0
7	Preparation of technical-economical assessment on destruction of obsolete and forbidden pesticides; elaboration of program on their destruction, including place, time and method of destruction.	60,0
8	Destruction of obsolete and forbidden.	500,0
9	Realization of measures on destruction of pesticides and soil mixtures	5000,0
10	Conducting of complex ecological researches in pesticides burial places.	250,0
	Total:	**7135,0***

*** without cost of:**

a) transportation of pesticides to the place of destruction;

b) purification, rehabilitation, liquidation of storage facilities, soils contaminated with pesticides, including territories of burial places.

● *C. PCB-containing electro-technical equipment*

№	Category of problems	Cost in USD thousands
1	Adaptation of legislation; elaboration of normative requirements, regulating turnover, exploitation, storing and utilization of PCB-containing electro-technical equipment and elimination of PCBs wastes.	20,0
2	Elaboration of monitoring system (elaboration of statistics reporting form №1-PCBs).	50,0
3	Detailed inventory of PCB-containing electro-technical equipment.	250,0
4	Installation of special storage facilities for decommissioned PCB-containing electro-technical equipment.	50,0
5	Collection and preparation of PCB-containing electro-technical equipment for transportation to the place of organized storing.	10,0
6	Identification, labeling, updating of database and reporting.	255,0
7	Preparation of technical-economical assessment on utilization PCB-containing electro-technical equipment and destruction of PCBs wastes, basing on BAT/BEP principles.	20,0
8	Plan on utilization of PCB-containing electro-technical equipment and destruction of PCBs wastes.	30,0
9	Utilization of PCB-containing equipment and destruction of PCBs wastes.	200,0
10	Assessment of possible effects on human health and environment.	150,0
	Total:	**1035,0***

*** without cost of:**

a) building/purchasing of enterprises on utilization of PCB-containing electro-technical equipment;

b) transportation of PCB-containing electro-technical equipment to the place of destruction;

● *D. Reduction of emissions from unintentional production of dioxins and furans.*

№	Category of problems	Cost in USD thousands
1	2	3
1	Elaboration of normative-legislative documents in sphere of uPOPs management.	40, 0
2	Establishment of National Monitoring System on dioxins and furans emission.	150,0
3	Establishment of republican laboratory on dioxins.	2000,0
4	Conducting of complete assessment of uPOPs (dioxins and furans). Revelation of new sources on dioxins and furans emission, their identification and monitoring.	150,0

1	2	3
5	Receiving of more detailed information on dioxins and furans emission in metallurgical sector, especially by production of initial aluminum and by production of burnt anodes (burning of "green" anodes) in Tajik Aluminum Company.	100,0
6	Elaboration of annual register on dioxins and furans emissions.	30,0
7	Elaboration of recommendations on implementation of BAT/BEP in reconstructed and new enterprises for reduction of dioxins and furans emissions.	100,0
8	Management of medical wastes by means of safe environmental methods.	430,0
9	Elaboration of system on medical wastes collection and establishment of enterprise on their treatment with taking into consideration of BAT/BEP principles.	450,0
10	Elaboration of measures on reduction of dioxins and furans emissions from small sources, which have serious influence on total volume of emission.	30,0
11	Supporting of education and training on the base of strategy on public awareness raising, as a part of commitments on Stockholm Convention realization; conducting of strategy review every 5 years for determination of success in activity.	30,0
	Total:	**3510,0**

- *F. Determination of used substances and wastes' stocks for assessment and management of emissions from stocks and wastes, which contain DDT, PCBs and uPOPs*

№	Category of problems	Cost in USD thousands
1	Completion of works on creation of database on "hot spots", old stocks, wastes and POPs-contaminated territories.	15,0
2	Elaboration of program on conducting of local researches, including the risk assessment. Elaboration of recommendations on rehabilitation measures.	150,0
3	Creation of database and mapping of territories in accordance with levels of POPs-contamination, including sources of contamination (storage facilities, burial places and etc.).	175,0
4	Elaboration of methodical manuals: on elimination of stocks and wastes; on rehabilitation of POPs-contaminated territories and monitoring of their condition.	30,0
5	Elaboration of program on solution of contaminated territories problem with taking into consideration the issue of sufficient financing. Reduction and prohibition of long-term storing of all POPs-containing materials on the.	45,0
6	Supporting of researches and elaboration of new technologies, basing on the principles of complete liquidation of POPs wastes. Selection of optimal method of wastes removal (recycling- burning-storing).	90,0
	Total:	**505,0**

- *G. Management of stocks and undertaking of appropriate measures on handling and elimination of used hazardous materials.*

№	Category of problems	Cost in USD thousands
1	Updating of existing normative-legislative base and information for assurance of safe chemicals' management.	75,0
2	Identification of storage facilities, intended for temporary keeping of DDT stocks.	15,0
3	Elaboration of manual on safe handling (transportation and safe keeping) and destruction of stocks.	15,0
4	Establishment of centers and schemes on collection of used substances.	15,0
	Total:	**120,0**

- *H. Identification of contaminated territories (chemicals of Annexes A, B and C) and their rehabilitation by environmentally safe methods*

№	Category of problems	Cost in USD thousands
1	2	3
1	Elaboration of normative-legislative documents on revelation and management of contaminated territories.	100,0
2	Elaboration of Republican Program on inventory of contaminated territories with high risk for public health and environment. Determination of financial sources.	20,0

1	2	3
3	Conducting of detailed inventory of contaminated territories. Revelation of territories, contaminated with POPs (pesticides, PCBs).	200,0
4	Analysis of ecological risks and assessment of necessity in decontamination of these territories / destruction of contaminated soil.	40,0
5	Selection of methods on contaminated territories rehabilitation.	15,0
6	Training of qualified personnel, dealing with rehabilitation of contaminated territories.	100,0
7	Selection of methods for destruction of contaminated soil.	15,0
	Total:	**490,0***

*** without cost of:**

a) rehabilitation of contaminated territories in accordance with existing standards;

b) elimination of contaminated soils;

c) prevention of new contamination of environment.

- *I. Rehabilitation of pesticides burial places.*

№	Category of problems	Cost in USD thousands
1	• Elaboration of technical-economical assessment on appropriate remediation or liquidation of Kanibadamski and Vahshski pesticides burial places, including following researches: • geological; • meteorological; • hydro-geological; • sanitary-hygienic; • assessment of risk for human health; • effects on environment; • socio-economical aspects.	150,0
2	Elaboration of project on the base of technical-economical assessment results.	250,0
3	Rehabilitation of pesticides burial places.	4600,0
	Total:	**5000,0**

- *J. Researches, development and monitoring*

№	Category of problems	Cost in USD thousands
1	Development of institutional and research capacity in sphere of POPs management.	500,0
2	Creation of mechanism for assuring of monitoring quality.	100,0
3	Identification of appropriate laboratories for realizing of monitoring on all activities, connected with POPs.	20,0
4	Modernization of laboratories, which are capable to conduct analyses of chemicals, listed in Annexes A, B and C.	1000,0
5	Determination of POPs availability levels in the environmental components.	500,0
6	Arrangement of appropriate data management.	250,0
	Total:	**2370,0**

- *K. Elaboration of policy on public awareness raising on POPs issues*

№	Category of problems	Cost in USD thousands
1	Elaboration of program on public awareness raising with taking into consideration the financial and technical possibilities.	15,0
2	Implementation of programs on education of public community.	5,0
3	Supporting of process on public awareness raising in sphere of POPs effects on human health and environment.	50,0
4	Collection and processing of POPs information. Establishment of group for information collection.	30,0
5	Arrangement of process on information dissemination.	80,0
6	Training of workers, technical and administrative personnel in corresponding institutions.	50,0
	Total:	**230,0**

- *L. Facilitation and arrangement of information exchange and involvement of interested parties*

№	Category of problems	Cost in USD thousands
1	Establishment of National Agency on information exchange within NCSC.	55,0
2	Training of associates on appropriate knowledge and skills.	15,0
3	Strengthening of national capacity on collection and use of information from various sectors.	20,0
4	Determination of partners' commitments.	-
5	Supporting of health care issues consideration.	10,0
	Total:	**100,0**

- *M . The technical and financial help (Clauses 12 and 13)*

№	Category of problems	Cost in USD thousands
1	Search of sources on technical assistance for successful implementation of Convention.	15,0
2	Search of sources on financial assistance for successful implementation of Convention.	15,0
	Total:	**30,0**

LIST OF ABBREXIATIONS

ADB	Asia Development Bank
AIDS	Acquired Immune Deficiency Syndrome
AUSR IHTPM	Al-Union Scientific Research Institute of Hygiene and Toxicology of Pesticides, Polymeric and Plastic Mass
BAT	Best Available Technologies
BEP	Best Environmental Practice
BRSREC	Bashkir Republican Scientific Research Ecological Center
CA	Central Asia
CCD	Complex Cleaning Devices
CCE	Control of Contaminants Emission
CIS	Commonwealth of Independent States
CPR	Chinese People's Republic
CS	Customs Service within Government of the Republic of Tajikistan
CSC	Chemical Safety Center
DCC	Diseases Control Center
DDD	Dichlor-diphenyl-dicholoethane
DDE	Dichloro-diphenyl-dichloroethylene
DDT	Dichloro-diphenyl-trichloroethane
DGCD	Dust-gas cleaning devices
EAEC	Euro-Asian Economical Cooperation
EECCA	Eastern Europe, Caucasus, Central Asia
ERDB	European Reconstruction and Development Bank
GBAO	Gorno-Badahshan Autonomous Oblast (Region)
GDP	Gross Domestic Product
GEF	Global Ecological Fund
GF	Global Fund
g/TE	Gram of Toxicity Equivalent
HGD GRT	Head Geological Department within Government of the Republic of Tajikistan
HIV	Human Immunodeficiency Virus
HCB	Hexachlorobenzene
HCH	Hexachorocyclohexane
IDB	Islamic Development Bank
ICBM	Industrial Complex of Building Materials
ICEM	International Center of Ecological Monitoring
IEC	International Ecological Council
IFASR	International Fund on Aral Sea Rescue
IMF	IMF International Monetary Fund
ISA	Исламское Го Islamic State of Afghanistan
ISCCWI	Inter-State Committee on Coordination of Water Issues
ISCSD	Inter-State Committee on Sustainable Development
IPSMCS	International Program on Safe Management of Chemical Substances
KR	Kyrgyz Republic
MA&EP	Ministry of Agriculture and Environment Protection
ME	Ministry of Education
MED&T	Ministry of Economical Development and Trade
ME&I	Ministry of Energy and Industry
MES	Ministry on Extraordinary Situations
MJ	Ministry of Justice
MF	Ministry of Finances
MT&C	Ministry of Transport and Communications
MH	Ministry of Health
MPC	Maximum Permissible Concentration
NAPEP	National Action Plan on Environnent Protection
NAPEHP	National Action Plan on Environment and Health Protection
NATO	North Atlantic Treaty Organization
NCC	National Coordination Committee
NC SC	National Center on of Stockholm Convention on POPs
NCSD	National Committee on Sustainable Development
NEMS	National Environmental Monitoring System
NES	National Ecological Strategy
NGO	Non-governmental Organization
NIP	National Implementation Plan
OCP	Organochloric Pesticides
OEC	Organization on Economical Cooperation
OSCE	Organization on Security and Cooperation in Europe
pc	Picogram
PCBs	Polychlorinated biphenyls
PCDD	Polychlorinated dibenzo-p-dioxins
PCDF	Polychlorinated dibenzo-p-furans
PCO	Project Coordination Office
PCP	Pentachlorophenol
POPs	Persistent Organic Pollutants
PVC	Polyvinylchloride
RCI	Republican Center of Immune-Prophylaxis
RRS	Regions of Republican Subordination
PRSP	Poverty Reduction Strategy Paper
PSRE	Republican Scientific-Research Enterprise
RF	Russian Federation
RSLI	Relatively Safe Level of Influence
RT	The Republic of Tajikistan
RTCST	Register of Toxic Chemical Substances Transmission
RU	The Republic of Uzbekistan
SACRT	State Air-Company of the Republic of Tajikistan
SC	Stockholm Convention of POPs
SCEP&F	State Committee on Environment Protection and Forestry
SES	Sanitary-Epidemiological Service
ShOC	Shanghai Organization on Cooperation
SIC ISCSD	Scientific Informational Center within Inter-State Committee on Sustainable Development
SMW	Solid Municipal Wastes

SSC	State Statistics Committee
SPZ	Sanitary Protective Zone
TIHE	Tajik Institute on Hygiene and Epidemiology within Ministry of Health
TIPM	Tajik Institute on Preventive Medicine within Ministry of Health
t. r.	Tons of reactant
UN	United Nations
UN EEC	UN European Economical Commission
UNDP	United Nations Development Program
UN FAO	UN Food and Agriculture Organization
UN ESCAPC	UN Economical and Social Commission for Asia and Pacific Countries
UNEP	UN Environment Program
UNICEF	UN International Children's Emergency Fund
uPOPs	Unintentionally Produced POPs
USAID	USA Agency for international Development
USSR	Union of Soviet Socialistic Republics
WB	World Bank
WFP	World Food Program
WHO	World Health Organization

In the process of elaboration National Implementation Plan on commitments of the Republic of Tajikistan on realization of Stockholm Convention of POPs, the following organizations took part:

Executive Committee within President of the Republic of Tajikistan

Majlisi Oli of the Republic of Tajikistan

Academy of Sciences of the Republic of Tajikistan

State Statistics Committee of the Republic of Tajikistan

Ministry of Agriculture and Environment Protection of the Republic of Tajikistan

Ministry of Economical Development and Trade of the Republic of Tajikistan

Ministry of Energy and industry of the Republic of Tajikistan

Ministry of Health of the Republic of Tajikistan

Ministry of Foreign Affairs of the Republic of Tajikistan

Ministry of Finances of the Republic of Tajikistan

Ministry of Justice of the Republic of Tajikistan

National State University

Abu Ali ibn Sino Tajik State Medical University

Customs Service within Government of the Republic of Tajikistan

Non-governmental Organizations:

- "For Earth" Youth Organization
- "Green Patrol" NGO
- "Farzandi Sino" NGO
- "Chashma" NGO
- "Youth of 21st Century" Social Organization
- Center on Legal Support of Youth

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Denmark (Copenhagen city) - Mr. JOHN VIJGEN

Slovakia (Bratislava city) - Mr. MARTIN MURIN, Doctor of Chemical Sciences

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ANNEX

Annex A1: list of seminars, meetings and conferences on POPs problem with participation of representatives of the Republic of Tajikistan.

Third Conference of Parties of the Stockholm Convention on POPs;
(COP-3), Dakar, Senegal, 30th April – 4th May 2007;
Second Conference of Parties of the Stockholm Convention on POPs;
(COP-2), Geneva, Switzerland, 1st – 5th May 2006;

Regional Seminar "Study of experience and best practice in sphere NIP elaboration in accordance with Article 7 of the Stockholm Convention on POPs for countries of Central and eastern Europe and Central Asian region", Sofia city, Bulgaria, 15th – 17th February 2006;

Regional Seminar "Assessment of existing capacity and necessity in capacity building for analyses of POPs situation in developing countries", Beijing, China, 13th – 16th December 2005.

Seminar "Determination of priorities on POPs reduction in Kazakhstan", Astana city, Kazakhstan, 20th August 2005.

Regional Consultative Meeting for countries of Central Asia and Eastern Europe on elaboration of BAT/BEP Manual, Vienna, Austria, 9th – 11th February 2005.

Syb-regional Seminar on realization of Stockholm Convention on POPs and other Conventions on chemical substances, Almaty city, Kazakhstan, 26th – 27th July 2003.

All Union Conference on POPs problem, Moscow city, Russian Federation, 28th – 29th October 2002.

Su-regional Seminar on preparatory work for realization of Stockholm Convention on POPs, Kiev, Ukraine, 21st – 25th October 2002.

All-Russian Seminar "Inventory of obsolete pesticides stocks", Voronezh city, Russian Federation, 29th – 30th March 2000.

Sub-regional Conference on revelation and assessment of POPs emission, Saint-Petersburg, Russian Federation, 1st – 4th July 1997.

Annex A2: List of materials on public awareness raising.

Stockholm Convention on persistent organic pollutants, (brochure in Tajik language).
Persistent organic pollutants and sustainable human development (brochure in Russian language).
Persistent organic pollutants and sustainable human development (brochure in Tajik language)).
Persistent organic pollutants and their properties,
(brochure in Russian language).
Persistent organic pollutants and their properties,
(brochure in Tajik language).
Effects of persistent organic pollutants on human health and environment, (brochure in Russian language).
Effects of persistent organic pollutants on human health and environment, (brochure in Tajik language).
First twelve persistent organic pollutants,
(brochure in Russian language).
First twelve persistent organic pollutants,
(brochure in Tajik language).
Unintentionally produced persistent organic pollutants, (brochure in Russian language).
Unintentionally produced persistent organic pollutants, (brochure in Tajik language).
Stockholm Convention on persistent organic pollutants, (brochure in Russian language).
Stockholm Convention on persistent organic pollutants, (brochure in Tajik language).
Polychlorinated biphenyls – spheres of use and their effects on human health, (brochure in Russian language).
Polychlorinated biphenyls – spheres of use and their effects on human health, (brochure in Tajik language).
Pesticides – benefits and harmfulness, (brochure in Russian language).
Pesticides – benefits and harmfulness, (brochure in Tajik language).
Effects of dioxins and furans on environment and public health, (brochure in Russian language).
Effects of dioxins and furans on environment and public health, (brochure in Tajik language).
Table-calendar for 2007.
Calendar for 2006 , (format A 2).
Table-calendar for 2006.
Pocket-calendar for 2006).
Pocket-calendar for 2005.
Table-calendar for 2005.
Legislative acts in sphere of management and regulation of hazarous chemical substances, including POPs, in the Republic of Tajikistan, 2005.
Information bulletin “Stockholm Convention on POPs” (in Tajik language), 2004.
Persistent organic pollutants; their effects on human health and environment (Manual for trainers), 2005.
Newspaper “Navruzi Vatan”, newspaper of State Committee on Environment Protection and Forestry, №11 (185), August 2006.
Video-film “POPs problems”
Video-film “POPs problems in Tajikistan”.

Annex A3: additional information about persistent organic pollutants.

In accordance with Stockholm Convention, following substances refer to POPs:

Organochloric pesticides are used for combat against agricultural pests, weeds and infec-tious diseases carriers. During use of these pesticides should be observed the requirements, specified in the Article 3 of Convention "Measures on reduction or stopping of emissions as a result of intentional production and use".

Aldrin – white crystalline substance without smell, quick solved in organic solvents, stable from chemical and thermal point of view, slow sensitive to the light. It is metabolizing with forma-tion of dieldrin in soil, plants and organisms of insects. It is used as the intestinal and contact insecticide for combat of termites, locusts and soils' pests. It was forbidden for use in agriculture since 1973.

Dieldrin – white crystals with naphthalene. It is insoluble in water, good dissolving in or-ganic solvents; it is stable from chemical and thermal point of view; also it is stable to alkalis, weak acids and light. It is used as contact and intestinal insecticide in composition of seeds' protectants, and also as preparation for combating of insects, which are carriers of infectious diseases and which live in soils of arable lands. It was forbidden for use in agriculture from 1985.

Endrin – white crystal substance melting temperature 226-230o C, practically insoluble in water, good dissolving in majority of organic solvents; stable in acid and alkali media. It is used for combating of ticks, and also as zoocide. This insecticide is used for sparge of cotton, rice, maize and other crops' leaves. Also, it is used as preparation against mice, field-voles and other rodents.

Mirex - white crystal substance melting temperature 485o C, practically insoluble in water, moderately dissolving in organic solvents; stable in acid and alkali media. It is used for combating of solenopsis ants and other kinds of ants and termites.

Chlordane – it is the yellowish oil without smell with boiling-point 175o C; practically in-soluble in water, good dissolving in majority of organic solvents; stable in acid and alkali media. It is the insecticide with broad action spectrum. It is used intensively in agriculture for combating of rodents as contact-intestinal insecticide. It was forbidden for use in agriculture from 1985.

Heptachlor – technical heptachlor brown waxy mass, insoluble in water, good dissolving in majority of organic solvents. It is more volatile from all used pesticides. It is used for protection of sugar-beet, maize and other crops from soil pests, termites, cotton pests, locusts and malarial mos-quitoes. It was forbidden for use in agriculture from 1992.

Hexachlorobenzene (HCB) – the clean preparation is white lamellate crystals; practically in-soluble in water, ethanol; good dissolving in organic solvents. It is used in agriculture as protectant against fungous and bacterial diseases agent.

Dichlorodiphenyltrichloroethane (DDT) – one of the most knew POPs. DDT – it is white crystal substance with low volatility. Good dissolving in many organic solvents: aromatic hydrocar-bons and their halogen derivates, ketones, esters of carbonic acids. It is slowly dissolved in alphetic and acyclic hydrocarbons (till 4%). The technical product contains 75 – 76% of reactant. Higher melting temperature, it is exposed to dechlorination with formation of dichlorodiphenyldichlore-thene (DDD). DDT was used as contact and system insecticide for many agricultural crops, in for-estry, for pest control as the sanitary preparation and etc. DDT was used during World War II as the protective means for military personnel and civilian population for combating of malaria, typhus and other diseases, transmitted by insects. It is used still in certain countries as the preparation for control of malaria, tick-encephalitis and plague carriers. It was forbidden for use in agriculture from 1970.

Toxaphene – the toxic base is chlorinated camphene ($C_{10}H_{10}Cl_8$); it is the dense fluid of dark-brown color. It is practically insoluble in water; good dissolved in majority of solvents. It is decomposed by availability of alkalis and ultra-violet light. It is used as intestinal-contact insecti-cide on the agricultural fields, where beetroot, potatoes, cotton, peas, nuts, fruits, vegetables and grain-crops are grown. Also, it is used for combating of various ticks in domestic animals.

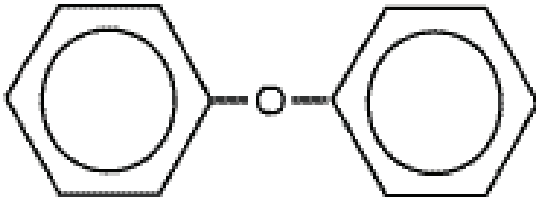
2. Industrial POPs:

Polychlorinated biphenyls – it is the substances, in handling of which the special require-

ments, indicated in the Article 3 of Convention “Measures on reduction and stopping of emissions as a result of intentional production and use”, should be observed. PCB-containing substances, used as liquid dielectrics in transformers and capacitors, coolants and hydraulic systems; also they are used by production of glues, dyes, mastics, fire retardants, plastic masses, paper with carbon-free copying layer and pesticides’ stuff.

PCBs relate to POPs group, which are chemically inert and jointed under general name – chlorinated hydrocarbons. PCBs are persistent, toxic and bio-accumulated; they may be transferred to the great distances in various media.

PCBs – it is the group containing 209 isomers with molecular formula $C_{12}H_{10-n}Cl_n$, where number of chlorine atoms is from one to ten.



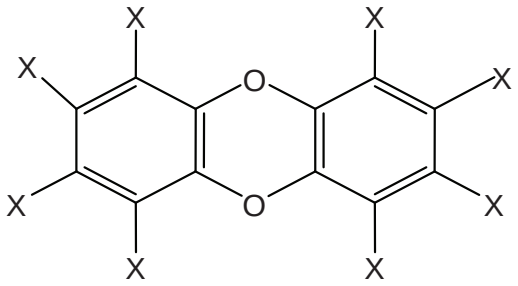
PCBs, mainly pentachlorodiphenyls or the mixture of tetra- and pentachlordiphenyls, were produced in former USSR under the trade names of various sovols: sovol plasticizer (TU-6-01-4683387-39-90) and sovol и совол electro-isolation, sovtol-10 (ОСТ-6-01-17-85).

PCBs have certain advantages: refractoriness, low electro-conductivity, high resistance to thermal breakdown, high chemical stability and resistance to oxidants; all these factors stipulated their bride use.

PCBs were never produced in Tajikistan.

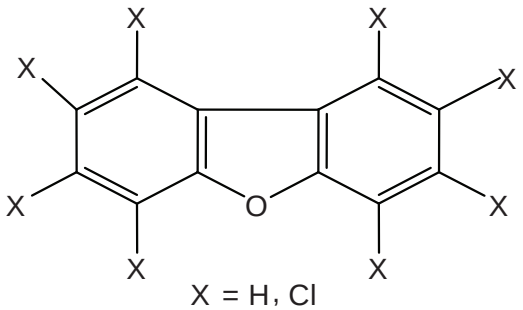
Unintentionally produced POPs, in handling of which the special requirements, indicated in the Article 5 of Convention “Measures on reduction and stopping of emissions as a result of intentional production”, should be observed: PCBs, HCB, polychlorinated dibenzo-p-dioxins (PCDD) - dioxins and polychlorinated dibenzofurans (PCDF) - furans, which are the most harmful from all POPs. Unintentional formation and dioxins and furans emission is the result of industrial thermal processes by availability of organic substances and chlorine, and also the processes, connected with incomplete burning of municipal and industrial wastes, during forest and steep fires. Practically all industrial enterprises in various branches may be considered as sources of dioxins and furans. The main of them are following: power engineering, non-ferrous and ferrous metallurgy, chemical, pet-rochemical, pulp-and-paper and cement industry. Dioxins and furans are available in exhausts of vehicles, tobacco smoke and gases, which are formed by combustion of fossil fuel and woods.

Polychlorinated dibenzo-p-dioxins – it is dioxins, three-nuclear aromatic combinations, formed in two benzene rings, jointed by two atoms of oxygen; the atoms of hydrogen may be replaced by chlorine atoms in amount up to 8.



X = H, Cl

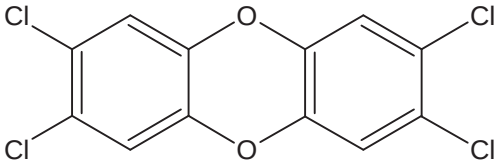
Polychlorinated dibenzofurans – it is furans, three-nuclear aromatic combinations, formed in two benzene rings, jointed by one atom of oxygen and one carbon-carbonic connection, the atoms of hydrogen may be replaced by chlorine atoms in amount up to 8.



X = H, Cl

In accordance with data of USA Environmental Agency, nowadays were identified 75 diox-ins and 135 furans. Many of them are toxic. The extent of toxicity varies in dependence on their structure and components.

Among all kinds of dioxins, the tetrachlorinated dibenzodioxin with jointed chlorine atoms in 2,3,7, and 8 positions (2,3,7,8-TCDD):



is the most toxic.

Annex A4: Normative-legislative base of management and regulation.

Methodical guidance on collecting payments for environment contamination. From 29.12.1993,. № 126. РД-0193:

- it is used as the regulatory mechanism for observation of rules on pesticides storing; specifies the violations of these rules and their consideration as throwing of wastes in unau-thorized dumps. Payment is collected with increasing rate;
- it includes payments as the regulatory mechanism for observation of limits on con-taminants emission to the water reservoirs, included to POPs list – DDT and toxaphene.

Main procedures, connected with air-transportation of hazardous loads, realized by planes of civil aviation of USSR. Statement of Ministry of Civil Aviation from 06.05.1991, № 195/y:

- the document specifies the requirements to Technical Instructions on safe air-transportation of hazardous loads; unifies the procedure on admission of hazardous loads to the air-transportation, determines the conditions of reception and storing in air-port of delivery, giving out of permission for their transportation and registration of transportation docu-mentation, determines the requirements to safety measures.

Technical instructions on safe air-transportation of hazardous loads. ИКАО 1999-2000г. Doc. 9284-AN/905 SUPPLEMENT:

- it explains the main principles of limitations during air-transportation of hazardous loads; specifies the requirements to packaging sets;

Instruction on safety assuring by incidents with hazardous loads*;*

- it determines the order of measures on prevention of incidents during air-transportation of hazardous loads, which should be observed by all air-transport personnel;

Instruction on safety assuring by incidents with hazardous loads*;*

- it determines the order of measures on prevention of incidents during air-transportation of hazardous loads, which should be observed by all air-transport personnel.

Rules of rail-way transportation of hazardous loads. From 05.04. 1996:

- they regulate rail-way transportation of hazardous loads in CIS countries. Hazardous loads are classified in accordance with State Standards 19433-88 “Hazardous loads. Classification and labeling”. The rules include requirements to containers, packaging and labeling of hazardous loads and also the condition of carriages.

Rules of hazardous loads transportation, Agreement on International Railway Load transportation; came into force from 01.11.1951, revised and issued with changes and addi-tions from 01.01.1998:

- it regulates the conditions of transportation of toxic substances (including pesticides), requirements to packaging, types of transportation, limitations by transportation and other requirements.

Regime of international motor transportation in the Republic of Tajikistan, 04.08. 2003, №342:

- it regulates the procedure of organization international motor transportation on the territory of the Republic of Tajikistan. Regime of enter and departure to and from Tajikistan by motor transport is realized accordingly to special permission on import, export and transit delivery of hazardous loads.

Instruction on regime of hazardous loads transportation by motor transport, 04. 10. 1993, №554-c:

- it specifies the regime of hazardous loads transportation on the territory of the Republic of Tajikistan and determines the main requirements to organization, technical conditions and safety. Hazardous loads are defined accordingly with State Standards 19433-81 “Hazardous loads. Classification. Danger signs”. The rules or conditions of safe transportation of concrete type or groups of hazardous loads are elaborated by hazardous loads producers or transportation agency on the base of normative acts of State standards, Technical conditions, rules and etc.

Sanitary rules of storing, transportation and use of pesticides in agriculture, 20.09.1973, № 1123-73:

- they regulate the conditions of pesticides use in agriculture for prevention of poisoning peoples, dealing with them during working process (transportation, storing, treatment of plants, animals, birds, buildings, arable lands and so on), prevention of contamination food-stuffs, ambient air in

settlements, water reservoirs and soils.

Instruction on safety measures by storing, transportation and use of pesticides in agri-culture, 18.06.1984:

- it determines the requirements to assurance of safety by use of pesticides in agriculture, in industry, fire-fighting; observation of environment protection measures by transportation and use of chemical substances.

Temporary instruction on preparation and burying of forbidden and unfitted agricul-tural pesticides and their containers, 10.05.1989:

- it determines the regime of collection and preparation to burying of obsolete and forbidden solid and powdery pesticides and their containers.

Building norms and rules, 2.01.28-85. Burial places on sterilization and burying of toxic industrial wastes. Main provisions on projection, 26.06.85:

- they determine the requirements to selection of land plots, building process and rehabilitation of burial places, intended for sterilization and burying of industrial wastes with taking into consideration the principles of prevention contamination of environment and effects on human health.

Methodical manual on control of pesticides residuals in foodstuffs, 31.03.1972., № 973-72:

- it is intended for conducting of selective laboratory control for pesticides residuals in foodstuffs. In this methodical manual is specified the list of "Maximum permissible pesticides residuals and methods of their study".

Methodical manual for agencies of sanitary-epidemiological services on sanitary pro-tection of water-reservoirs from contamination with agricultural pesticides, 17. 04.1970, № 846-70:

- it is intended for realization of control and conducting measures on sanitary protection of water-reservoirs from contamination with agricultural pesticides. In this methodical manual is specified the list of "Maximum permissible pesticides concentration in waters of sanitary-municipal water reservoirs".

Pesticides: rules of reception, selection of samples, packaging, transportation and storage; State Standards 14189-81, 30.06.1981, № 3190:

- it specifies the rules of reception, selection of samples, packaging, transportation and storage of pesticides.

Maximum permissible concentrations of pesticides in soil (MPC). List № 6, 5.08.85, № 3919-85.:

- it contains the list of pesticides, MPC, limiting indicators and methods of their determination.

Statement "On State control of agricultural plants protection from pests and diseases in USSR", 2.11.1970.:

- it specifies the requirements to land-users in sphere of conducting measures on combating of pests, plant diseases and weeds; observation of regulations concerning pesticides use for prevention of pesticides residuals accumulation in agricultural productions, in soil, in water reservoirs and other environmental components in higher quantity than safe norms.

Statement on control-toxicological laboratories within State Plant protection Services:

- it regulates the laboratory control in sphere of observation of fixed norms on use of plant protective means in agriculture;
- conducting of selective analyses of plant-growing productions (excepting forage) for determination of pesticides residuals availability and subsequent determination of their use norms with taking into consideration the local soil-and-climatic conditions;
- control of pesticides preparations' quality;
- control of quality of pesticides, which were delivered to the households or which were kept in storage facilities during long time.

State Standards on regulation of PCBs and PCB-containing materials and equipment (1976-1988):

- they specify the technical requirements, safety measures, rules of reception, testing, packaging, labeling, storage and transportation, guarantee of production of power condensers and their installations, transformers and condensers' oil, impregnation electro-isolation fluid and other PCBs and PCB-containing materials and equipment.

Methods of determination damages, stipulated by violation of land-use legislation. In-struction on payment collection and compensation paid to the state for violation of land-use legislation, 14 07. 1999:

- it specifies the determination damages, stipulated by violation of land-use legislation, including

non-observation of technologies and regulations by use of chemical fertilizers and pesticides, and also non-observation of environmental requirements by storage, loading and transportation.

List of chemical and biological means for combating of pests, plant diseases and weeds, recommended for use in agriculture. Список химических и биологических средств борьбы с вредителями, болезнями растений и сорняками, рекомендованных для приме-нения в сельском хозяйстве. Year-book:

- it contains the list of chemical and biological means, permitted for use in agriculture.

Manual of the Republic of Tajikistan 50-009-2000 "Order of legislative measures ap-plication by Tajik-Standard by conducting of state control of observation requirements, speci-fied in normative documentation":

- it specifies the order of legal measures application for violations of rules on certifica-tion of production (works, services), indicated in the Laws of the Republic of Tajikistan "About certification of production and services" (Article 19), "About protection of consum-ers' rights" (Articles 38 and 39), and also the Decree of President of the Republic Tajikistan No. 1111 from 20.11.1998 "About certain measures on protection of consumer market" and Statement of Government of the Republic of Tajikistan from 16th March 1999 "About protec-tion of consumer market from low-quality commodities", revealed by state control.

Standard of the Republic Tajikistan 50.01-2000 "State control of standards and meas-urement means. Interconnection of Tajik-Standard agencies and law machineries of Tajiki-stan. Application of legislative measures":

it is intended for revelation of violations rules of production and sale of commodities, violation of standards of industrial processes or destruction of materials (accordingly to fixes requirements).

Licensing of activities and giving out of permissions

Regime of licensing in sphere of ecological expertise, 3 07. 2003, № 300;

Regime of licensing of activities, connected with handling of hazardous wastes, 6. 06. 2003, № 252

Regime of pesticides and agro-chemicals registration, 22.04.2003.

Licensing of activities, connected with expertise on chemical, 17.05.2004, № 37

Licensing in sphere of production and safe handling with pesticides and agro-chemicals (determined in legislation but not included to the obligatory list on licensing).

Licensing on exploitation of chemically dangerous industrial objects, 17. 05. 2004, № 37.

Licensing of activities, connected with transportation of hazardous loads by the railway, 17. 05. 2004, № 37.

Licensing of activities, connected with transportation of hazardous loads by the motor trans-port, 17.05. 2004, № 37.

Licensing of activities, connected with transportation of hazardous loads by the air-transport, 17. 05. 2004, № 37.

Technical instructions on safe transportation of hazardous loads by air (Document ИКАО 9284-AN/905).

Instructions about activities in contingencies, connected with air-transportation of hazardous loads (Document ИКАО 94-81-AN/928).

Main procedures, connected with air-transportation of hazardous loads with use of civilian aviation of USSR, 06.05.1991, № 195/y.

Conclusions of state ecological expertise in sphere of economical and other activities.

Regime of registration and giving out of sanitary-epidemiological conclusions.

Permission on use of chemical substances, biological preparations, plants growth-promotion factors, chemical fertilizers, other substances and preparations, which are used in Tajikistan at the first time.

Permission for emission of contaminating substances available in sewages with determination of their limits (MPC).

Determination of norms, MPC, of contaminants' emission to the atmosphere with specifica-tion of limits on cleaning and volume of emission.

Permission for burying (warehousing) of industrial and solid municipal wastes (excluding radioactive ones) in special places: pesticides burial places, natural terraces, collectors, storage facilities for industrial wastes and etc., 1993.

Special permission for import, export and transit delivery of hazardous loads by motor trans-port.

Annex A5: National Register of obsolete and forbidden pesticides (2005).

Districts	Total volume of pesticides, tons	Including:			Mixtures of pesticides with soil, tons
		Forbidden	Unfitted	Unknown mixtures	
Sugd region					
Ashtski	3,72	-	3,32	0,40	150
B. Gafurovski	6,14	-	5,84	0,30	210
Zafarabadski	21,50	17,00	0,50	4,00	201
kanibadamski	11,02	-	0,72	10,30	138
Matchinski	7,49	-	5,29	2,20	120
J. Rasulovski	4,95	-	3,35	1,60	141
Spitamen	2,50	-	-	2,50	66
Kanibadamski pesticides burial place	3000	100	-	2900	-
Total in region	**3057,32**	**117,00**	**19,02**	**2921,300**	**1026**
Hatlon region					
Bohtarski	12,40	-	5,50	6,90	351
Vahshski	24,90	-	1,10	23,80	354
Kolhozabadski	11,50	-	5,50	6,00	342
Kumsangirski	6,70	-	-	6,70	366
Jami	-	-	-	-	264
Yavanski	3,20	-	-	3,20	405
Voseiski	9,30	-	3,20	6,10	327
Kulyabski	7,10	-	2,80	4,30	180
Hamadani	14,20	-	2,30	11,90	483
Farhorski	11,40	-	2,20	9,20	363
Vahshski pesticides burial place	7500,0	3500,0	-	4000,0	-
Total in region	**7600,70**	**3500,0**	**22,60**	**4078,10**	**3435**
Regions of Republican Subordination (RRS)					
Tursunzadevski	1,00	-	-	1,00	15
Gissarski	1,07	0,55	0,52	-	3
Vahdat	-	-	-	-	21
Total in RRS	**2,07**	**0,55**	**0,52**	**1,00**	**39**
Total in republic	**10660,1**	**3617,6**	**42,14**	**7000,40**	**4500**

Annex A6: National Register on PCB-containing electro-technical equipment (2003).

B	Information on equipment, potentially containing PCBs								
Name of enterprise (or-ganization), workshop, department	Number of transformers								
	Type, year of production	Total number	Including:						
			Period of exploita-tion	In reserve	Decommis-sioned	Place of storing:			PCB con-tent, kg
						Indoors	In the yard of enter-prise	In special places	
"Tajik Aluminum Com-pany" State Unitary Enterprise, Tursun-zadeh city									
• Foundry №2	ТН3П-1600/10 year of production 1980	1	1						2850
	ТН3П-1600/10 year of production 1983	1	1						2850
Total:		**2**	**2**						**5700**
"Sirandut" Ltd., Hu-jand city	ТН3-1000/10 year of production 1973	4	1	3					7200
СУ-29, Isfara city	ТН3-630/10	1	1						1100
"Tajikistan" Ltd., Ga-furov city	ТНП-400/10	1	1						1500
"Nilufar" Ltd., Isfara city	ТН3-630/10	4	3		1	1			4000
	ТН3-400/10	1	1						1000
Sub-total:		**5**	**4**						**5000**
TOTAL:		**13**	**9**	**3**	**1**	**1**			**20500**

REGISTER FORM
Register of PCB-containing equipment (2003)

B	Information on equipment, potentially containing PCBs								
Name of enterprise (or-ganization), workshop, department	Number of transformers								
	Type, year of production	Total number	Including:						
			Period of exploita-tion	In reserve	Decommis-sioned	Place of storing:			PCB con-tent, kg
						Indoors	In the yard of enter-prise	In special places	
1	2	3	4	5	6	7	8	9	10
"Shabakahoi barkii of Dushanbe city " Ltd.									
• RP-1	КСО-0,38-12,5	11	11						77
• RP-3	КСО-0,38-12,5	8	8						56
• SRP	КСО-0,38-12,5	2	2						14
Total:		**21**	**21**						**147**
"Textile" Ltd.									
• DIOP, substation workshop	КС2-0,38-50 3У3 year of production 1982	260			260	260			5980
	КСК2-0,4-67 3У3, year of production 1982	19			19	19			361
	КС1-0,38	21			21	21			252
Total:		**300**			**300**	**300**			**6593**
"Ravgani Tojik" Ltd.									
• TSRP	КСК2-10,5-150 2У1	6			6	6			114
Total:		**6**			**6**	**6**			**114**

1	2	3	4	5	6	7	8	9	10
"Tajik Aluminum Com-pany" State Unitary En-terprise									
• TSNP - Foundry	КС2-0,50-36 2У3, year of production 1973	8	8						184
	КС2-0,66-50 2У3, year of production 1980	15	15						345
Total:		**23**	**23**						**529**
• TSSH – storage facility № 2	КС2-0,66-50 2У3, year of production 1975	10		10					230
	КС2-0,50-36 2У3, year of production 1975	132		132					3036
Total:		**142**		**142**					**3266**
TSKRE – installation of ca-thode blocks	КС2-1,05-75 2У3, year of production 1986	70	70						1610
Total:		**70**	**70**						**1610**
TSPPE – 1-3. Technological line of ICHT furnaces	КС2-0,50-36 2У3, year of production 1978	128	50		78		78		2944
	КС2-0,60-50 2У3, year of production 1978	207	207						4761
	КС2-1,05-75 2У3, year of production 1978	220	220						5060
Total:		**555**	**477**		**78**		**78**		**12765**
• *Foundry:*									
• LO № 1	КС2-0,66-50 2У3, year of production 1981-1986	588	542		46	46			13524
• LO № 2	КС2-0,66-50 2У3, year of production 1981-1986	298	250		48	48			6854
Total:		**886**	**792**		**94**	**94**			**20378**

1	2	3	4	5	6	7	8	9	10
Total on "Tajik Aluminum Company"		1676	1362	142	172	94			38548
Asbestos-pipe Factory	KC2-0,38-36 3У3, year of production 1982	1			1	1			23
Total:		**1**			**1**	**1**			**23**
"Tajik-Cement" State Uni-tary Enterprise	KC2-0,38-36 3У3, year of production 1982	6			6			6	138
Total:		**6**			**6**			**6**	**138**
"Korhonai Mebelsozi shahri Dushanbe" Ltd.									
• TRP № 2	KC2-0,38-36 3У3, year of production 1977	10	10						230
	KC1-0,38-25 3У3, year of production 1980	14	12		2	2			168
	KC1-0,4-331/3 3У3, year of production 1980	5	5						60
• TSRP – 1123	KC2-0,38-36 3У3, year of production 1977	2	2						46
Total:		**31**	**29**		**2**	**2**			**504**
"Complex Enterprise shahri Dushanbe" Ltd.									
• RU – 0,4	KC1-0,38-16 3У3, year of production 1974	15	15						225
• TP – 1029	KC2-0,38-36 3У3, year of production 1975	18	18						414
Total:		**33**	**33**						**639**
"ZHBK&SD" Ltd.									
• Reinforcing workshop	KC2-0,38-50 3У3, year of production 1981	11	11						253
Total:		**11**	**11**						**253**

1	2	3	4	5	6	7	8	9	10
“Avtorem” Ltd.									
	КС1-0,38-25 ЗУЗ, year of production 1981	12	8		4	4			144
	КСК2-0,38-50 ЗУЗ, year of production 1981	7	4		3	3			133
Total:		**19**	**12**		**7**	**7**			**277**
“Korhonai armature” Ltd.									
• Administrative Department, TP – 1	КСК1-0,4-331/3 ЗУЗ, year of production 1971	4	4						40
• Toolroom, TP – 4	КС2-0,38-50 ЗУЗ, year of production 1977	1			1	1			23
• Foundry. TP without number	КС2-0,38-36 ЗУЗ, year of production 1971	6	6						138
	КСК1-0,4-331/3 ЗУЗ, year of production 1981	3	3						30
• Foundry, TP without number	КС2-0,38-36 ЗУЗ, year of production 1975	9			9	9			207
• Foundry. TP without number	КС2-0,38-36 ЗУЗ, year of production 1975	9	9						207
• Foundry premises	КС2-0,38-36 ЗУЗ, year of production 1973	30			30	30			690
• Basement of induction furnaces	КС2-0,38-36 ЗУЗ, year of production 1973	32	32						736
Total:		**94**	**54**		**40**	**40**			**2071**
“Humo” Ltd.									
• Foundry	КС2-1,05-75 ЗУЗ, year of production 1979	48	48						1104
• TP – 1014	КС2-1,05-75 ЗУЗ, year of production 1979	12		12					276
• TP – 1016	КС2-1,05-75 ЗУЗ, year of production 1979	8		8					184
Total:		**68**	**48**	**20**					**1564**

1	2	3	4	5	6	7	8	9	10
“Interfer” TP – 1457	KC2-0,38-50 ЗУЗ, year of production 1979	12	6		6	6			276
Total:		**12**	**6**		**6**	**6**			**276**
“Kuhandis” Ltd.									
• Shoe Factory № 4, TP – 1425	KC2-0,4-67 ЗУЗ, year of production 1977	6	6						138
• Shoe Factory № 3, TP – 1254	KCK1-0,4-331/3 ЗУЗ, year of production 1973	3	3						30
• “Kozhzavod” Substation	KCK2-0,4-67 ЗУЗ, year of production 1977	1	1						19
• TP – 361 (treatment facilities)	KCK2-0,38-36, ЗУЗ year of production 1976	13	11		2	2			247
Total:		**23**	**21**		**2**	**2**			**434**
“Kimiyo” Ltd.									
• Workshop №15, TP-10-5	KC2-0,38-36 ЗУЗ, year of production 1974	5			5	5			115
• TP-1-10	KC2-0,38-36 ЗУЗ. year of production 1974	11			11	11			253
• Workshop № 4, TP-1-7	KC2-0,38-36 ЗУЗ, year of production 1974	6			6	6			138
• Workshop № 3, TP -1-12	KC2-0,38-36 ЗУЗ, year of production 1974	12			12	12			276
Total:		**34**			**34**	**34**			**782**
“Obshoron” Ltd.									
• Reinforcing Workshop, TP – 7	KC2-0,38-50 ЗУЗ, year of production 1976	2			2	2			46
Total:		**2**			**2**	**2**			**46**
“Asbestos-Cement” Ltd.									
• TP-1	KC2-0,38-50 ЗУЗ, year of production 1988	12	6	6					276
• RU-0,4	KC2-0,38-50 ЗУЗ, year of production 1988	12	6	6					276
Total:		**24**	**12**	**12**					**552**

1	2	3	4	5	6	7	8	9	10
"Sarv" Ltd.									
• Workshop № 1	KC2-0,38-36 3У3, year of production 1975	3		3					69
• TP – 234	KC2-0,38-36 3У3, year of production 1975	2		2					46
Total:		**5**		**5**					**115**
"Sharki ozod" Ltd.									
• Electric panel for 1,2,3 floors	KC1-0,38-25 3У3, year of production 1983	15		15					180
• TP in basement	KC2-0,38-50 3У3, year of production 1984	7			7	7			161
Total:		**22**		**15**	**7**	**7**			**341**
"Dushanbinski Vodocanal" State Unitary Enterprise									
• Kafarniganskaya Pumping facility, RU-2	KC2-6,3-75 2У3, year of production 1981	6	6						138
	KC2-10,5-75 3У3, year of production 1981	1			1	1			23
• Kafarniganskaya Pumping facility, RU-1 KKU-2	KC2-6,3-75 2У3, year of production 1981	2	2						46
Total:		**9**	**8**		**1**	**1**			**197**
Cotton Factory "Beparas-ton", Kulyab city	KC2-0,38-36 3У3	2	2						46
"Kabul Tajik Textile" Joint Enterprise	KC2-0,38-50 3У3	62	62						1426
"VT-SILK" Ltd.	KC2-0,38-36 3У3	9	9						207
"Dehkon" Ltd	KC2-0,38-36 3У3	18		18					414
"SATN" Ltd.	KC2-0,38-36 3У3	6		6					138
"LAL" Ltd.	KC2-0,38-36 3У3, year of production 1985	18	12	6					414
"Hujantski Tinned Food Factort" Ltd.	KC2-0,38-36 3У3, year of production 1988	13	9		4	4			299
	KC2-0,38-36 3У3, year of production 1990-92	14	10	4					322

1	2	3	4	5	6	7	8	9	10
“Javoni” Joint Enterprise	КС2-0,38-36 ЗУ3, year of production 1980	2	2						46
“Nonpaz” Ltd.	КС2-0,38-50 ЗУ3	16	16						368
“Poiafzolduzi” Ltd.	КС2-0,38-50 ЗУ3	6	4		2	2			138
“Parandaparvar-2” Ltd.	КС2-0,38-36 ЗУ3, year of production 1984	6	4		2	2			138
“Tamohush IGMZ” Ltd.	КС2-0,38-50 ЗУ3, year of production 1989	24	24						552
	КС1-0,38-18 ЗУ3, year of production 1992	6	6						60
“Noni Isfara” Ltd.	КС2-0,38-50 ЗУ3	6	6						138
“Zuhal” Ltd.	КС2-0,38-36 ЗУ3	4	4						92
“Sharbati Kostakoz” Ltd.	КС2-0,38-36 ЗУ3	3	3						69
	КС2-0,38-503У3	1	1						23
“Britania Pulodon” Ltd.	КС2-0,38-50 ЗУ3	7	7						161
Gas-Filling Station “Aziz”	КС2-0,38-36 ЗУ3	2	2						46
“Sherzod & K” Ltd.	КС2-0,38-50 ЗУ3	1	1						23
	КС2-0,26-	1	1						23
Total:		**2**	**2**						**46**
“Nurtex” Ltd.	КС2-0,38-50 ЗУ3, year of production 1977	16	10		6	6			368
“Komron” Ltd.									
• ТР № 2	КС2-0,38-50 ЗУ3, year of production 1984	3	3						69
• ТР № 3	КС2-0,38-50 ЗУ3, year of production 1984	1	1						23
• ТР № 6	КС2-0,38-50 ЗУ3, year of production 1984	3	3						36
• ТР № 5	КС2-0,38-50 ЗУ3, year of production 1984	4	4						92
Total:		**11**	**11**						**220**

1	2	3	4	5	6	7	8	9	10
“Ravgan” Ltd.	КС2-0,38-50 ЗУ3	6		6					138
“Avto-VAZ” Technical Service station	КС2-0,38-50 ЗУ3	2	2						46
“1st May” Cooperative As-sociation	КС1-0,38-50 ЗУ3	3	3						36
“Vostokredmet” State En-terprise	КС1-0,38-253У3	21	21						252
	КС2-0,38-50 ЗУ3	28	28						644
	КС2-0,38-36 ЗУ3	3	3						69
	КС2-6,3-50 ЗУ3	45	45						1035
Total:		**97**	**97**						**2000**
“Shahzod” Ltd.	КС-2-0,38-36	5	5						115
TOTAL:		**2764**	**1930**	**234**	**600**	**516**	**78**	**6**	**61681**

Список аббревиатур

ZGBK & SD	Ferroconcrete items and acquisition of components
LO	Foundry Part
RU	Distribution device
SRTS	Northern Distribution Center
SU	Building Department
TP	Transformers’ Point
TSKRE	Workshop of capital reparation of electrodes
TSPPE	Workshop of electrodes production
TSRP	Central Distribution Point
TSTNP	Workshop on consumer goods production

Register of PCB-containing wastes (2003)

Equipment	Number	PCB-containing wastes, kg
Transformers	1	4000
Capasitors	600	10400
TOTAL	601	14400

Annex A7: National Register of dioxins and furans emission (2003).

Sector	Categories of sources	Emission per year (gram of TE / year)				
		Air	Water	Soil	Ashy dust	Slag
1	Burning of wastes	0,963	0,000	0,000	0,000	0,0
2	Production of ferrous and non-ferrous metals	13,435	0,000	0,000	0,000	133,4
3	Production of electricity and thermal energy	12,530	0,000	0,000	0,000	0,0
4	Production of commodities from mineral raw materials	0,750	0,000	0,000	0,000	0,0
5	Transport	0,401	0,000	0,000	0,000	0,0
6	Uncontrolled combustion processes	3,966	0,000	0,000	0,000	7,4
7	Production and use of chemical substances and consumer goods	0,000	0,000	0,000	0,000	0,0
8	Miscellaneous	0,000	0,000	0,000	0,000	0,0
9	Removal / Burying	0,000	0,000	0,000	0,000	0,0
10	Revelation of hot spots					
1-9	**Total:**	**32,0**	**0,0**	**0,0**	**0,0**	**140,8**

Category	Sub-category	Class	Categories of sources	Potential direction of emissions (mg TE/tons)					Produc-tion tons / year	Emissions per year (g TE / year)				
				Air	Water	Soil	Food-stuff	Re-main-ders		Air	Water	Soil	Ashy dust	Slag
1		2	3	4	5	6	7	8	9	10	11	12	13	14
2			PRODUCTION OF FERROUS AND NON-FERROUS METALS											
	a		**Agglomeration of iron ore**						0	0,000	0	0	0	0,000
		1	Use of wastes, including contamination with oil	20	NR	NR	NR	0,003		0,000				0,000
		2	Use of wastes in enterprises with good control	4	NR	NR	NR	0,003		0,000				0,000
		3	High-technology enterprises; decreasing of emissions	0,3	NR	NR	NR	0,003		0,000				0,000
	b		**Coke production**							0,000	0	0	0	0
		1	Without gases purification	3	0,06	NR	NR	NR		0,000	0			
		2	Removal of dust	0,3	0,06	NR	NR	NR		0,000	0			
	c		**Ferrous metallurgy enterprises, including foundry: cast iron and steel production**							0,362	0,0	0,0	0,0	
		1	Contaminated wastes, initial heating of wastes, limited control	10	NR	NR	NU	15	36 145	0,361				0,542
		2	Clean wastes/iron, dust collector / cloth filter	3	NR	NR	NU	15	479	0,001				0,007
		3	Clean wastes/iron, converters	0,1	NR	NR	NU	1,5		0,000				0,000
		4	Blast-furnaces with Air Contamination Control (ACC)	0,01	NR	NR	NU	NR		0,000				
			Foundry						0	0,000	0	0	0	0,000
		1	Cupola-furnaces with cold-blast or rotary drum without Air Contamination Control (ACC)	10	NR	NR	NR	NR		0,000				
		2	Rotary drum-furnaces – cloth filter	4,3	NR	NR	NR	0,2		0,000				0,000
		3	Cupola-furnaces with cold-blast, cloth filter	1	NR	NR	NR	8		0,000				0,000
		4	Cupola-furnaces with hot-blast or induction furnaces, cloth filter	0,03	NR	NR	NR	0,5		0,000				0,000

(NR - Not revealed; NU - Not used)

1		2	3	4	5	6	7	8	9	10	11	12	13	14
	d		**Copper production**							0,000	0,0	0,0	0,0	0,0
		1	Secondary copper – Base technology	800	NR	NR	NR	630		0,000				0,000
		2	Secondary copper – Good control	50	NR	NR	NR	630	5	0,000				0,003
		3	Secondary copper – control, optimized for PCDD/PCDF	5	NR	NR	NR	300		0,000				0,000
		4	Melting and pouring of copper / copper alloy	0,03	NR	NU	NU	NR		0,000				
		5	Initial copper – all types	0,01	NR	NR	NR	NR		0,000				
	e		**Production of aluminum (all secondary)**							13,007	0	0	0	
		1	Processing of aluminum wastes, minimal cleaning of raw materials, simple dust collecting	150	NR	NR	NR	400	12 041	1,806				4,816
		2	Processing of wastes, good control, good with Air Contamination Control (ACC)	35	NR	NR	NR	400	320 040	11,201				128,016
		3	Drying of cuttings / wastes	10	NR	NR	NR	NU		0,000				
		4	Optimized process, optimized with Air Contamination Control (ACC) system.	1	NR	NR	NR	400		0,000				0,000
	f		**Production of lead**						1	0,000	0	0	0	0
		1	Secondary lead from wastes, PVC separators accumulators.	80	NR	NR	NR	NR		0,000				
		2	Secondary lead from wastes without PVC/ Cl2, blast-furnaces with cloth filters	8	NR	NR	NR	NR	1	0,000				
		3	Secondary lead, wastes without PVC/Cl2, not in blast-furnaces or in blast furnaces with scrubbers	0,5	NR	NR	NR	NR		0,000				
	g		**Production of zinc**						0	0,000	0	0	0	0
		1	Kiln without dust control	1000	NR	NR	NR	NR		0,000				
		2	Hot briquetting / rotary furnace, bases control	100	NR	NR	NR	NR		0,000				
		3	Comprehensive control 5	5	NR	NR	NR	NR		0,000				
		4	Smelting (exclusively)	0,3	NR	NR	NR	NR		0,000				
	h		**Production of brass**							0,000	0	0	0	0
		1	Simple smelting furnaces	1	NR	NR	NR	NR		0,000				
		2	Complex equipment, for example: induction furnaces with Air Contamination Control (ACC)	0,1	NR	NR	NR	NR	40	0,000				

(NR - Not revealed; NU - Not used)

1		2	3	4	5	6	7	8	9	10	11	12	13	14
	l		**Production of magnesium**						0	0,000	0,000	0	0	0,000
		1	Thermal processing MgO/C to Cl2, without cleaning of sewage, poor with Air Contamination Control (ACC) system	250	9 000	NU	NR	0		0,000	0,000			
		2	Thermal processing MgO/C to Cl2, comprehensive control of contamination	50	24	NU	NR	9 000		0,000	0,000			0,000
	j		**Thermal production of non-ferrous metals (for example: Ni)**								0	0	0	0
		1	Contaminated wastes, simple control of dust and its lacking	100	NR	NR	NR	NR		0,000				
		2	Clean wastes, good Air Contamination Control (ACC) system	2	NR	NR	NR	NR		0,000				
	l		**Shredder**						0	0,000	0	0	0	0
		1	Enterprises on metal decomposition	0,2	NU	NU	NR	NR		0,000				0,000
	m		**Thermal regeneration of metals from cable**						0	0,000	0	0	0	0
		1	Open burning of cable	5000	NR	NR	NR	NR		0,000				
		2	Simple furnace with before-burning device, with wet washer	40	NR	NU	NR	NR		0,000				
		3	Burning of electric motor, break block and etc. with before-burning device	3,3	NR	NU	NR	NR		0,000				0,000
2			**Production of ferrous and non-ferrous metals**							**13,435**	**0,000**	**0,000**	**0,000**	**133,384**

(NR - Not revealed; NU - Not used)

Category	Sub-category	Class	Categories of sources	Potential direction of emissions (mg TE/tons)					Production tons / year	Emissions per year (g TE / year)				
				Air	Water	Soil	Food-stuff	Re-main-ders		Air	Water	Soil	Ashy dust	Slag
1		2	3	4	5	6	7	8	9	10	11	12	13	14
3			PRODUCTION OF ELECTRICITY AND THERMAL ENERGY											
	a		**Электростанции на ископаемом топливе**							0,008	0	0	0	0,1
		1	Electric power stations, using fossil fuel	35	NU	NU	NU	NR		0,000				
		2	Energy-boilers on fossil fuel + wastes	1,2	NU	NU	NU	14	3 800	0,005				0,1
		3	Energy-boilers on coal	0,178	NU	NU	NU	NR	4 903	0,001				
		4	Energy-boiler on heavy oil fuel (black oil)	0,0285	NU	NU	NU	NR	56 813	0,002				
	b		**Energy-boilers on petroleum fuel / natural gas**		NU	NU	NU		0	0,000	0	0	0	0,0
		1	Electric power station on bio-fuel	500	NU	NU	NU	NR		0,000				
		2	1. Energy-boilers not on wood	50	NU	NU	NU	15		0,000				0,0
	c		**2. Energy-boilers on wood**		NU	NU	NU		0	0,000	0	0	0	0,0
		1	Combustion of wastes of the organic origin, bio-gases	8	NU	NU	NU	NU		0,000				
	d		**Energy-boiler on bio-gases, motors/ turbines and torches**		NU	NU	NU			12,383	0	0	0	86,1
		1	Heating of houses and cooking (bio-fuel)	1 500	NU	NU	NU	2 000		0,000				0,0
		2	Furnaces on contaminated woods / bio-fuel	2,9	NU	NU	NU	20	4 303 002	12,479				86,1
	e		**Furnaces on not-contaminated woods / bio-fuel**		NU	NU	NU	Ng TE/kg ashes		0,043	0	0	0	6,0
		1	Heating of houses – Fossil fuel	2,1	NU	NU	NU	5 000	1 200	0,003				6,0
		2	Furnace on coal	0,29	NU	NU	NU	NR		0,000				
		3	Furnaces on petroleum fuel oil	0,044	NU	NU	NU	NR	908 610	0,040				0,000
3			**Production of electric power and thermal energy**					**12,530**	**0**	**0**	**0**	**91,5**		

(NR - Not revealed; NU - Not used)

Category	Sub-category	Class	Categories of sources	Potential direction of emissions (mg TE/tons)					Production tons / year	Emissions per year (g TE / year)				
				Air	Water	Soil	Food-stuff	Re-main-ders		Air	Water	Soil	Ashy dust	Slag
1		2	3	4	5	6	7	8	9	10	11	12	13	14
4			PRODUCTION OF COMMODITIES FROM MINERAL RAW MATERIALS											
	a		**Cement furnaces**						193 600	0,116	0	0	0	0,019
		1	Wet-mix process, temperature of electric filter >300°C	5	NU	NR	NR	1		0,000				0,000
		2	Wet-mix process, temperature of electric filter 200-300 °C	0,6	NU	NR	NR	0,1	193 600	0,116				0,019
		3	Wet-mix process, temperature of electric filter <200 °C + all types of dry process	0,15	NU	NR	NR	0,003		0,000				0,000
	b		**Lime production**			NR	NR				0	0	0	0
		1	Cyclone or lack of dust control	10	NR	NR	NR	NR	60 913	0,609				
		2	Good dust control	0,07	NR	NR	NR	NR		0,000				
	c		**Bricks production**			NR	NR		98 205	0,020	0	0	0	0
		1	Cyclone or lack of dust control	0,2	NU	NR	NR	NR	98 205	0,020				
		2	Good dust control	0,02	NU	NR	NR	NR		0,000				
	d		**Glass production**		NU	NR	NR		21	0,000	0	0	0	0
		1	Cyclone or lack of dust control	0,2	NU	NR	NR	NR		0,000				
		2	Good dust control	0,015	NU	NR	NR	NR	21	0,000				
	e		**Ceramics production**		NU	NR	NR		0	0,000	0	0	0	0
		1	Cyclone or lack of dust control	0,2	NU	NR	NR	NR		0,000				
		2	Good dust control	0,02	NU	NR	NR	NR		0,000				
	f		**Preparation of asphalts blends**		NU	NR	NR		130 471	0,005	0	0	0	0,005
		1	Enterprises without gas purification	0,07	NU	NR	NR	NR	50 000	0,004				
		2	Enterprises with cloth filters, wet washer	0,007	NU	NR	NR	0,06	80 471	0,001				0,005
4			**Production of commodities from mineral raw materials**		**0,750**	**0**	**0**	**0**	**0,024**					

(NR - Not revealed; NU - Not used)

Category	Sub-category	Class	Categories of sources	Potential direction of emissions (mg TE/tons)					Production tons / year	Emissions per year (g TE / year)				
				Air	Water	Soil	Food-stuff	Re-main-ders		Air	Water	Soil	Ashy dust	Slag
1		2	3	4	5	6	7	8	9	10	11	12	13	14
5			TRANSPORT											
	a		**Four-cycle engine**							0,311	0	0	0	0
		1	Diesel fuel	2,2	NU	NU	NU	NR	140 372	0,309				
		2	Non-diesel fuel without catalyst	0,1	NU	NU	NU	NR	15 597	0,002				
		3	Non-diesel fuel with catalyst	0,00	NU	NU	NU	NU		0,000				
	b		**Two-cycle engine**						0	0,000		0	0	0
		1	Diesel fuel	3,5	NU	NU	NU	NR		0,000				
		2	Non-diesel fuel without catalyst	2,5	NU	NU	NU	NR		0,000				
	c		**Diesel engines**						180 500	0,090	0	0	0	0
		1	Diesel engines	0,5	NU	NU	NU	NR	180 500	0,090				
	d		**Heavy oil fuel**						0	0,000	0	0	0	0
		1	All types	4	NU	NU	NU	NR		0,000				
			Transport							**0,401**	**0**	**0**	**0**	**0**

(NR - Not revealed; NU - Not used)

Category	Sub-category	Class	Categories of sources	Potential direction of emissions (mg TE/tons)					Production tons / year	Emissions per year (g TE / year)				
				Air	Water	Soil	Food-stuff	Re-main-ders		Air	Water	Soil	Ashy dust	Slag
1		2	3	4	5	6	7	8	9	10	11	12	13	14
6	6		**UNCONTROLLED COMBUSTION PROCESSES**											
	a		**Fires / combustion of biomass**						0	0,000	0	0,000	0	0
		1	Forest fires	5	NR	4	NU	NR		0,000		0,000		
		2	Grassland fires	5	NR	4	NU	NR		0,000		0,000		
		3	Combustion of agricultural residuals in the field	30	NR	10	NU	NR		0,000		0,000		
	b		**Fires, burning of wastes, fired on the dumps, fires in industrial enterprises, accidental fires**						12 798	3,966	0	0,000	0	7,424
		1	Fires on the dumps	1000	NR	NU	NU	NR		0,000				
		2	Accidental fires in buildings (per one accident)	400	NR	See remainders	NU	400	1 272	0,509				0,509
		3	Uncontrolled combustion of municipal wastes	300	NR	See remainders	NU	600	11 526	3,458				6,915
		4	Accidental fires in transport means	94	NR	See remainders	NU	18		0,000				0,000
		5	Open-air burning of woods (by building / deconstruction of buildings)	60	NR	NR	NU	10		0,000				0,000
6			**Uncontrolled combustion processes**				**3,966**	**0**	**0,000**	**0**	**7,424**			

(NR - Not revealed; NU - Not used)

Cat-egory	Sub-cate-gory	Class		Air	Water	Soil	Food-stuffs	Remain-ders
				"x" specifies the necessity for conducting of special local research				
10			REVELATION OF "HOT SPOTS"					
	a		Places					
		1	Chlorophenol and derivative of PCP					
		2	Other organochloric compounds					
	b		Places of chlorine production					
		1	with graphite electrode					
		2	without graphite electrode		x	x		
	c		Preparation of prescribed blends of chlorinated pesticides		x	x		
	d		Places of use pesticides, contaminated with dioxins			x		
	e		Places of wood production					
		1	with use of PCP and other dioxin-containing preservatives					
	f		PCB-containing equipment					
		1	with leakage		x	x		
		2	without leakage		x	x		
	g		Dumps of wastes / remainders in categories 1-9		x	x		
	h		Places of accidents		x	x		
	g		Excavation of ground (dredging works)		x	x		