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The International POPs Elimination Project

*Fostering Active and Effective Civil Society Participation in
Preparations for Implementation of the Stockholm Convention*

Armenia Country Situation Report

English summary

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About the International POPs Elimination Project

On May 1, 2004, the International POPs Elimination Network (IPEN <http://www.ipen.org>) began a global NGO project called the International POPs Elimination Project (IPEP) in partnership with the United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Program (UNEP). The Global Environment Facility (GEF) provided core funding for the project.

IPEP has three principal objectives:

- Encourage and enable NGOs in 40 developing and transitional countries to engage in activities that provide concrete and immediate contributions to country efforts in preparing for the implementation of the Stockholm Convention;
- Enhance the skills and knowledge of NGOs to help build their capacity as effective stakeholders in the Convention implementation process;
- Help establish regional and national NGO coordination and capacity in all regions of the world in support of longer term efforts to achieve chemical safety.

IPEP will support preparation of reports on country situation, hotspots, policy briefs, and regional activities. Three principal types of activities will be supported by IPEP: participation in the National Implementation Plan, training and awareness workshops, and public information and awareness campaigns.

For more information, please see <http://www.ipen.org>

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This report is available in the following languages: English summary and Russian full report

Armenia Country Situation Report

English summary

Sources of POPs

The prevailing source of environmental pollution by POPs is industry, including the chemical sector; then agriculture (source of pesticides), energy sector, and unpremeditated production of toxics during industrial production, fossil fuel combustion, and waste generation.

The energy sector is one of the main production sectors in today's Armenia, so that the problem of environmental pollution by used mineral oils (possible sources of PCBs), and electric equipment, filled with these mineral oils, seems very important.

The results of studies of detection of traces of POPs (2003) confirmed that the levels of POPs in the environment are high enough to expect their migration from the environmental media to food products and living organisms. The results of many years of studies (1993 – 2003) showed that very often breast milk of Armenian women contained traces of organochlorine pesticides (86.2% of samples). 59% of breast milk samples contained traces of both DDE *and* Lindane, and in 26.6% of samples *either* DDE *or* Lindane was detected. In 0.6% of samples all three organochlorine pesticides (DDT, DDE and Lindane) were found simultaneously. Only 13.8% of samples did not contain traces of these substances.

Levels of POPs Pollution

Currently, 20 pesticides are used in basin of Lake Sevan. There are no persistent chlorine-containing substances among them. But this list is not inclusive, because there is no control over application of agricultural chemicals. The agricultural sector in Armenia is in private hands.

In the former USSR, use of DDT was banned in 1970. In 1981, use of HCCH was banned in the Lake Sevan basin. This suggests that no traces of organochlorine pesticides should be found in Lake Sevan today. Nevertheless, researchers continued to detect traces of HCCH and DDE in Lake Sevan during 1996 – 1999. Therefore, it seems very likely that even after official ban on HCCH, it was used. The most important media from the standpoint of environmental hygiene which accumulates POPs are soils, water, bottom sediments, and aquatic life. Food products, especially with high fat content, can accumulate POPs as well and thus cause threat to human health. The results of studies in 2003 confirmed that traces of POPs in environmental media are high enough so that their migration from the environmental media to food products and living organisms cannot be ruled out.

Accumulation of POPs in Environmental Media in Armenia

No	Media/object	Substance	% of detection	Concentration in microgram/liter or microgram/kg	
				Mean	Max
1.	River water	HCCH	60.8	0.134	0.708
		γ - HCCH	66.7	0.073	0.908
		DDT	21.6	0.137	0.831
		DDE	25.5	0.129	0.506
		DDD	23.5	0.713	4.571
2.	Bottom sediments of rivers (near energy sector facilities)	HCCH	60.7	4.581	47.059
		γ - HCCH	67.9	0.331	3.030
		DDT	39.3	0.429	1.700
		DDE	10.7	2.070	4.974
		DDD	21.4	0.291	1.039
3.	Wastewaters	HCCH	33.3	0.040	0.040
		γ - HCCH	0	-	-
		DDT	66.7	0.005	0.007
		DDE	33.3	0.042	0.042
		DDD	33.3	0.010	0.010
4.	Bottom sediments of wastewaters	HCCH	60.0	3.228	6.443
		γ - HCCH	60.0	0.170	0.268
		DDT	20.0	0.114	0.114
		DDE	20.0	1.394	1.394
		DDD	20.0	0.494	0.494
5.	Soil (near energy sector facilities)	HCCH	75.9	16.902	139.597
		γ - HCCH	55.2	4.658	13.423
		DDT	34.5	11.268	55.188

No	Media/object	Substance	% of detection	Concentration in microgram/liter or microgram/kg	
				Mean	Max
		DDE	41.4	4.254	15.273
		DDD	34.5	29.015	65.714

The results of recent studies of traces of organochlorine pesticides in food products (of phytogetic and animal origin) showed that POPs were detected in 53.8% of samples on average. This is rather high probability of detection, especially because both domestically produced and imported foods were tested (eggs, meat and meat foods, milk and diary products, macaroni, vegetable oil, rise, cereals, flour, coffee, tea, sugar, etc.). POPs are most frequently detected in meat and meat foods, milk and diary products, vegetable oil, eggs, rise, and macaroni (77% - 89% of samples).

The average concentrations (1993 – 2003) of Lindane were 0.0002 – 0.0150 mg/l, of DDE - 0.0007 – 0.045 mg/l, of DDT – two samples out of 30 - with 0.0589 mg/l and 0.0089 mg/l (in 2000). For example, in 2003, average concentration of Lindane was 0.0087 mg/l, and of DDE – 0.0183 mg/l.

Damage Caused by the Use of POPs

Infiltration of POPs in human organisms is well-documented in Armenia. According to the results of abovementioned studies, traces of organochlorine pollutants were found in 85% - 97% of samples of breast milk of Armenian women.

Detected trace quantities of POPs in breast milk are very low, but chronic exposure to these substances over long periods of time may cause increase in morbidity rates of population. Because of the multiple exposures and multiple characteristics of pesticides, the range of diseases caused by pesticides is difficult to diagnose. This is why it is important to study the relationship between pesticide use (especially organochlorine pesticides) and public health in the republic.

According to the latest data (2000 – 2002), the fraction of organochlorine pesticides used in the republic was 6% of total amount of applied plant protectants, and the share of preparations of 2, 4-D-family was 11%. Social and hygienic monitoring of rural population of Armenia established (positive) correlations between levels of pesticide use and prevalence of diseases. This study (1988 – 1991) confirmed that application of pesticides, especially organochlorine pesticides, negatively affects public health in rural areas.

The results of studies showed that application of pesticides negatively affects children's health. The correlation between organochlorine pesticide stress and the prevalence of childhood diseases (e.g. bronchial asthma, malignant tumors) was higher than analogous figures for the adult population.

There are many chemical plants in Armenia which produce different chemicals (chlorine, chloroprene, organic chlorinated substances) using high-temperature technologies. The technological features of these

plants, as well as uncontrolled incineration of industrial and household waste, may lead to formation of dioxins and their release to the environment.

The estimated volume of dioxin emissions in Armenia is 28.33 g/TEQ. Among all possible sources of dioxins, the most worrisome is a chloroprene rubber plant, whose estimated annual emissions of dioxins may reach 4.5 – 5 g/TEQ. This plant used to produce free chlorine by electrolysis of saline solution, carbide, acetylene from carbide (later acetylene was produced from natural gas), and various chlorinated organic substances (intermediate products in synthesis of chloroprene: monovinylacetylene, butadiene, 3,4-dichlorbutane-1). After distilling chlorinated products, high-boiling residues accumulated in the still, which were used in production of the acetate of dichlorophenoxyacetic acid. This acid was used as herbicide. All of the above chemical transformations require temperatures above 1000°C.

Many-year clinical trials have confirmed that plant workers had pathologies very similar to those specific to 2,3,7,8-tetrachlorodibenzo-p-dioxin.

Legislation that Regulates Use of POPs

In the Republic of Armenia, there is a system of legislative and institutional regulation of use of chemicals, including POPs. Control and management of chemicals is administered by different state organizations and local self-governance structures, at different stages of lifetime cycle of these chemicals. The control procedures are specified in the law of Armenia.

Currently, legislative basis in the area of management of chemical substances and waste, including POPs, requires further improvement. There are several laws and normative acts which regulate use of chemicals, including POPs in Armenia. These laws include:

- The law of the Republic of Armenia “On Expertise of Environmental Impacts”;
- The law of the Republic of Armenia “On Licensing”;
- The law of the Republic of Armenia “On Sanitary-Hygienic Safety of Population”; and
- “On Medicines”.

The intention of the legislators was to prevent negative impacts of chemicals and waste on the environment and public health.

Situation with Ratification of Stockholm Convention

The Republic of Armenia signed the Stockholm Convention on Persistent Organic Pollutants on May 23, 2001. The main objective of this convention is to protect the environment and public health from persistent organic pollutants (POPs). The Stockholm Convention was ratified by National Assembly of the Republic of Armenia on October 22, 2003.

Recommendations for Elimination of POPs

The review contains recommendations for elimination of POPs. These recommendations include:

- Creation of an effective system of accounting and control of import and application of pesticides by means of strengthening of legal and normative basis in this area;
- Creation of a system of replacement of outdated pesticides, especially chlorinated organic substances, with new modern plant protectants, this system should create incentives for small and medium-sized farms to participate;
- Creation of a system of standards for concentrations of pesticides in environmental media, and creation of unified normative documentation on pesticides;
- Implementation of unified methods for detection and control of pesticide content in environmental media, to increase safety of agricultural produce;
- Creation of a special fund for support of R&D to study influence of POPs on the environment and public health;
- Increase public awareness and public information about the risks of POPs pose to the environment and public health; publication of scientific reports, brochures, pamphlets, posters, etc.;
- Inclusion of POPs issues in university curricula (specializations in medical sciences, chemistry, environmental sciences).

For successful solution of all abovementioned tasks, a national action plan on POPs should be developed, with the goal of implementation of hygienically and environmentally-sound ways of elimination of POPs. This program should, as the first priority, strengthen legislative and legal basis of POP elimination policies, with participation of all interested ministries, agencies, and public organizations.