OBSOLETE PESTICIDE STOCKPILES: HOW TO REPORT ON POLLUTION

Overview of FAO, UNITAR, UNECE, EECCA documents and reports

According to information provided by UNITAR PRTR Programme, about 30 countries around the world already report their emissions and transfers of chemicals to air, water, and soil through their PRTR systems. Every year more countries are joining this initiative. PRTR is identified as one of the priorities to sound chemicals and waste management in countries. Some projects implemented in different countries including those from Eastern Europe, Caucasus and Central Asia (EECCA) aim to evidence the value of PRTR systems to report chemicals under different Multilateral Environmental Agreements (MEAs), such as the Stockholm Convention on POPs and the Strategic Approach to Internationals Chemicals Management (SAICM).

For now Moldova remains the only country of Eastern Europe, Caucasus and Central Asia (EECCA) that ratified the PRTR Protocol to the Aaurhus Convention. Nevertheless projects on PRTR are underway in Azerbaijan, Belarus, Georgia, Moldova, Kazakhstan.

According to the content of the PRTR Protocol, the PRTR reporting should be based on a reporting scheme that is:

- mandatory
- annual
- multimedia (air, water, land)
- facility-specific
- pollutant-specific for releases
- pollutant-specific or waste-specific for transfers.

Just as the Convention, the Protocol sets minimum requirements, which means that Parties are free to include additional pollutants and facilities.

PRTR accommodates available data on releases from diffuse sources such as agriculture. Thus PRTR could also be used as a tool to collect information and report on chemicals emission and releases from obsolete pesticide stockpiles as a diffuse source of pollution.

Common types of obsolete pesticides

Preliminary estimates from UNEP Chemicals indicate that about 30% of the old pesticides stored throughout developing countries are persistent organic pollutants (POPs). Common types of obsolete pesticides include organochlorine compounds such as DDT, dieldrin, HCH, HCB which have been banned under the Stockholm Convention on persistent organic pollutants. Another large group is organophosphates and carbamates that have deteriorated as a result of prolonged or improper storage. Examples of commonly found products that have deteriorated beyond usability include: dimethoate, fenitrothion, malathion, carbaryl, propoxur.

According to the FAO, half a million tonnes of obsolete pesticides are scattered throughout the developing world. These toxic chemicals, often stored outdoors in leaking containers, are penetrating into the soil and ground waters.

Hazards connected to obsolete pesticides

FAO highlighted major hazards associated with obsolete pesticides. Leaking drums and torn bags can seriously affect the occupational health of staff working at the storage site and of others who happen to come in contact with the pesticides. They often pose a broader general danger to public health and the environment. Factors determining the level of hazard include:

- the quantity of pesticides, the condition of containers and packaging and the degree of leakage;
- the place of storage (inside or outside a store) and the floor material of the storage site (degree of impermeability);
- the toxicity of the products;
- the behavior of the product in the environment (persistence, mobility in soil, solubility in water, volatility);
- the location of the storage site (some are located in or near urban areas);
- the groundwater level and proximity of the storage site to water bodies (some stores are located on irrigation schemes, near rivers or in ports).

Contamination of groundwater or soil can occur through seepage of leaked pesticides into the ground or runoff during heavy rains. Poisoning of people or animals can occur through direct contact with the product, inhalation of vapours, drinking of contaminated water, or eating of contaminated food. Other hazards include:

- fire hazard. Several examples are known of pesticide stores that have caught fire as a result of poor maintenance of stores and/or stocks. The environmental contamination caused by fires can be widespread;
- unauthorized use of pesticides. Examples are known of obsolete stocks that gradually decreased as a result of pilfering. Unauthorized or inappropriate use of pesticides is a notable cause of accidents or contamination;
- improvised disposal. In several cases pesticides have been disposed of by burying or open burning, which may cause severe environmental contamination.

Eliminating obsolete pesticide stockpiles is a development priority. Identification, safe storage, and remediation of obsolete pesticide are important issues that countries must deal with to fulfil their obligations under the Stockholm Convention and expressed in National Implementation Plans. PRTR Protocol to the Aarhus Convention could serve as a tool to help collect and report on toxic emissions and releases from obsolete pesticide stockpiles and burial sites as pollution source.

Obsolete Stockpiles in EECCA

Obsolete pesticides pose a significant environmental and health concern in countries of Eastern Europe, Caucasus and Central Asia (EECCA). The countries in the EECCA region have accumulated vast stockpiles of highly toxic obsolete pesticides containing inter alia persistent organic pollutants (POPs) which are listed under the Stockholm Convention on POPs. Exposure to POPs can lead to reproductive and hormone disruption, birth defects, and neurological disorders.

During the Soviet era, the EECCA republics received huge amounts of pesticides as part of an agricultural assistance programme to help with food production. After the collapse of the USSR, many of these countries lost control of the system completely – chemical stockpiles were left unguarded and obsolete chemicals were not stored properly.

Most of these chemical stores are found in poor, agricultural communities where uninformed farmers use the toxic chemicals on local crops or in their gardens. Toxic substances are often buried in ditches and stored in dilapidated buildings throughout the EECCA region. Governments lack the capacity, financial resources and political will to locate, quantify, monitor, identify, and finally eliminate the toxic chemicals, and many stockpiles are not recorded as part of the national inventories.

Although many POPs, such as the pesticide DDT, are no longer in production, they continue to poison people and the environment in invisible ways due to their persistent and bio-accumulative properties, and their ability to travel long distances from their original sources. The situation is made worse by improper storage of obsolete chemicals and broken containers which leak chemicals into the soil, contaminating water supplies and crops. In some parts of Central Asia, the banned toxic chemical, DDT, can still be bought in open markets and is used to keep fruit fresher for longer. It is not uncommon for local residents to use the dismantled warehouses as building materials for their own houses, fences, storages, etc. Obsolete pesticides lying on the ground at the open space can penetrate into the soil and ground waters causing harm to people and the environment.

10 out of 12 EECCA countries are parties of the Stockholm Convention on POPs. Uzbekistan and Turkmenistan are not Parties to POPs Treaty. According to the requirements of the Convention, Parties have to conduct inventories of obsolete pesticide stockpile and develop chemical management and clean up plans. Below are some examples of the current situation with obsolete pesticides in EECCA countries.

Armenia

Nubarshen obsolete pesticide burial site in Armenia contains more than 500 tones of obsolete and banned pesticides. In addition there are separate storages located in different parts of the country which contain about 50 tones of obsolete pesticides of more than 30 types, including 60% of organochlorine pesticide such as DDT, HCH and others. Currently Nubarchen burial site does not contaminate the environment, because it was significantly reconstructed during last 4 years. But the burial site is located in the active land-slide zone and thus the threat of potential contamination remains real. Other storage facilities are not safe and can pose threat to the environment and people.

Azerbaijan

Inventory of obsolete pesticide stokpiles was conducted in 2012. DDT, HCH, isophene, chlorophos were among identified pesticides. In total about 1500 tones of obsolete pesticides were revealed in 17 regions of Azarbaijan.

Moldova

This country represents the most successful approach of addressing obsolete pesticide stockpiles in EECCA. Between 2007-2015 2 766 t of obsolete pesticides were sent to Western countries for elimination; 31 out of 37 storage facilities were cleaned up. Still there are about 800 t of obsolete pesticides located in 6 storages. About 4 000 t are dumped in landfills in the southern part of the country.

Ukraine

According to official statistic data 8 regions in Ukraine do not have obsolete pesticide stockpiles; 4 regions have more than 500 t (Vinnitsky, Kherson, Sumsky, Odessky regions). Ukraine does not have organizations with the capacity and approved techniques for obsolete pesticide elimination.

Belarus

Belarus has accumulated 10625,2 t of obsolete pesticides, about 2836,0 t (27% of the total amount) are stored at agricultural storage facilities; 4626,4 t (43%) are buried in the burial sites; 3170,8 t (30%) are stored on the industrial toxic landfill in Gomel region. Some burial sites have observation wells to control releases.

Russia

According to the most modest estimation, about several tenths of thousands tons of obsolete pesticides are stored in Russia as a toxic legacy of pesticide overconsumption. Russia does not have technologies approved by the State Environmental Expertise for pesticide elimination. The only way to address this problem is to insure safe storage as well as find ways to transport some amounts abroad for elimination. For 20 years Russia with support from UNEP and ACAP has been implementing a programme on obsolete pesticide inventory, safe storage and safe transportation to storage facilities. For example in 2014, 50 t of obsolete pesticides were transported from Kurgansky area to toxic landfill located in the vicinity of Tomsk city for storage.

Georgia

In Georgia around 3 000 t of obsolete pesticides are located in Yagludjinsky burial site which is in a very poor condition. There are plans to transport 250 t of obsolete pesticides abroad for elimination. Collection and elimination of obsolete pesticide storage equipment is one of the most serious problem that needs to be addressed. In addition Georgia has to build permanent

storage facilities for identified and repacked obsolete pesticides which require sufficient finances, infrastructure and personnel training.

Kyrgyzstan

In 2014 Kyrgyzstan adopted a National inventory of Obsolete Pesticides. The inventory was conducted according to the FAO standards. Collected data was incorporated into the on-line System of obsolete pesticide stockpiles. In total according to official data there are 581 143 kg of obsolete pesticides in the country. The major problem is that nobody wants to take the responsibility for proper managing of obsolete pesticide stockpiles. There are no landfills for toxic wastes in the country. There are nor financial nor technical capacity to eliminate obsolete pesticide stockpiles. There are no mechanisms that would allow to transport toxic wastes to other countries for elimination.

Kazakhstan

In Kazakhstan only 20% of the territory went through obsolete pesticide inventory process. About 15 439 t of obsolete pesticides and pesticide mixtures have been revealed. Pesticide mixtures in stockpiles need to be identified. Aldrin, dieldrin, HCB were among identified pesticides. All of them are on the list of persistent organic pollutants under the Stockholm Convention on POPs.

Tajikistan

In Tajikistan there are two big pesticide burial sites located in Khatlonsky region (Vahshski site) and Sogdiisky region (Kanibadamsky site). In 1980s from 100 to 300 t of obsolete and banned pesticides from Tajikistan, Kyrgyzstan and Uzbekistan were buried or incinerated there. Kanibadam site occupies a territory of 1,4 hectares. The burial site represents a trench of 3-4 m depth constructed without waterproofing. The burial site was built in 1973 as a burial facility for HCH, DDT, butifos , Thun , Sevin , Zineb , BI- 58 , TUR , THFM , nitrofen , sulfur hammer, microbiological preparatory forms transported to this location from different agricultural organisations from all over the Soviet Union. Till 1989 the use of this burial site didn't meet the requirements of sanitary regulations for environmental security. Before its closure in 1990 about 4000 t of toxic chemicals were buried there, mainly POPs, as well as 3000 contaminated containers and large amount of biological preparatory forms.

Between 1973-1991 Vahshski site buried about 7 500 t of pesticides, including 3 000 t of DDT. In addition before 1990s there were 482 pesticide storage facilities in Tajikistan with the overall capacity of 141 754 t. The major portion of obsolete pesticides were stored in Khatlonsky region of Tajikistan (about 62 493 t). About 90% of obsolete pesticide storage facilities are dilapidated with free access to the sites and no warning systems in place. Many facilities store pesticide mixed with soil and mineral fertilizers.

Based on the data collected in the frame of the EU project in Tajikistan in 2009-2012, Kanibadamsky burial site contains inter alia DDT (17-35% of the overall amount of buried

pesticides), HCH (3-13% of the overall amount of buried pesticides). The majority of samples contained dieldrin (85%) and HCB .

Conclusion

In all EECCA countries the major problem associated with obsolete pesticides stockpiles is the identification of the burial sites. Still countries lack information about the precise location of these sites and the precise identification of the pesticides buried on the already well known sites. Some burial sites are destroyed, there are no fences that could protect the sites from people or animals. The surrounding areas are contaminated. Countries lack the system of obsolete pesticide management and the appropriate regulations.

Lack of information about pesticide health hazards resulted in many cases when local people dig out obsolete pesticides and use them as well as empty drums at the own land plots and for household needs. The remaining burial spots are left open exposed to winds and rains which increase their leaking into the soil and ground waters and emission into the air.

Often pesticide disposal sites are constructed on territories completely unsuitable for long term storage of hazardous materials with ground waters located very close to the surface. Some burial sites were constructed in zones of active landslides, which is the cause of violation of the integrity of the structures and thus contributes to the contamination of the nearby areas and groundwater.

The EECCA countries still do not have appropriate technologies for elimination of obsolete pesticide stockpiles. Thus there are two options to address this problem: manage safe storage and/or transport certain amounts of obsolete pesticides abroad for elimination.

Obsolete pesticides fall into the category of waste as defined by the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*, 1989 (UNEP/SBC, 1994). International transport of obsolete pesticides is therefore governed by this Convention. In addition, obsolete pesticides are subject to several international conventions regulating the transport of dangerous goods[1], which are all based on the UN's *Recommendations on the transport of dangerous goods* (UN, 1991). National regulations governing the transport and handling of hazardous waste may be applied for obsolete pesticides. Thus transporting obsolete pesticides abroad for elimination should meet the requirements of national and international regulations.

Considering current problems with obsolete pesticide stockpiles in the EECCAA, it becomes obvious that regular inventory of stockpiles should be carried out and permanent monitoring of toxic chemicals releases and emissions should be established. Monitoring data should become part of PRTRs in EECCA as a tool of public right to know on toxic chemicals impacting their health and the environment.