



Disposal of obsolete pesticides

A briefing for the *IPM in Developing Countries Project* funded by the European Commission *Environment in Developing Countries* budget (DGVIII)

This overview aims to introduce Commission officers, delegations, and policy advisers to pesticide disposal issues, to help them deal with existing problems and to prevent their recurrence.

Obsolete pesticide stocks in Africa

In Africa alone there are an estimated 20,000 tonnes of obsolete and unwanted pesticides out of an estimated total in developing countries of about 100,000 tonnes. A high proportion of the stocks are banned or highly toxic pesticides. Many of the stocks are stored in the open or in inappropriate stores, including some adjacent to drinking water sources or irrigation schemes or in urban residential areas. Containers are often leaking or corroded, and the bulk of pesticides are among the most hazardous formulations produced.

How have stocks accumulated?

Stores and dumps contain pesticides which are unusable for a number of reasons. They may have been banned after procurement and before they could be used. They may have deteriorated chemically or physically and be rendered unusable. They may have been wrongly or inappropriately formulated or packaged. The over-supply of pesticides to control locust plagues has been a major source of obsolete products. Another source has been inappropriate donations of pesticides by some donor agencies.

What can be done?

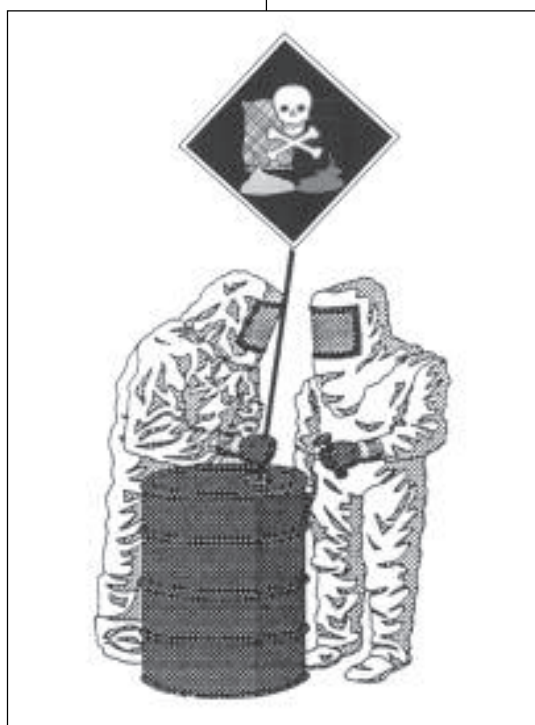
The UN Food and Agriculture Organisation (FAO) has taken the lead in coordinating action on obsolete and unwanted pesticides. FAO has carried out a preliminary inventory of stocks in Africa and the Near East. They have also raised funds and coordinated disposal operations in partnership with other aid agencies in a number of countries. Solutions to problems of obsolete and unwanted stocks are available but are generally costly and require specialist technical knowledge.

Recent examples of good practice

FAO and donor coordination has helped to secure safe disposal in some instances with measures being put in place to prevent further accumulations. Much is still to be done.

The way forward

Recommendations are given to deal with current problems of unwanted or obsolete stocks—including information on how to approach disposal or reuse of such compounds—and for preventing such problems from arising in the future. Page 4 of this briefing gives contacts and further resources.



*Pictograms courtesy of
FAO and US Environmental
Protection Agency*

A large proportion of the pesticides in obsolete stockpiles in Africa are unwanted donations or banned or hazardous products.

Obsolete stocks

In Africa and the Near East there are an estimated 20,000 tonnes of obsolete pesticides. The total of obsolete pesticide stocks in the developing world is thought to be at least 100,000 tonnes. These are pesticides which are unusable because they have been banned, have deteriorated chemically or physically, are wrongly formulated or

packaged, are in the wrong place or for some other reason cannot be used.

Many of the stocks are stored in the open or in inappropriate stores including some adjacent to drinking water sources or irrigation schemes or in urban residential areas. Many of the containers are leaking or corroded, and many of the pesticides are among the most toxic formulations produced. Banned organochlorines such as dieldrin, aldrin, chlordane and heptachlor and highly toxic organophosphates such as parathion, ethoprophos, dichlorvos and monocrotophos make up a high proportion of the stocks. Dr Bateno of the Ministry of Agriculture in Ethiopia, has drawn attention to the problem: "Obsolete pesticides are found in governmental offices, state farms and some enterprises ... metallic containers are rusty and leaking, plastic and paper containers torn. Large quantities of pesticides are found spilled in almost all stores."

Why has the problem arisen?

Many factors have contributed to the formation of the present stockpiles of obsolete pesticides including:

- ❖ Banning of products—some pesticides were supplied in large quantities for use in agriculture or for the control of major pest outbreaks such as locusts or malaria vectors. When the pesticides were subsequently banned because of their hazards to health and the environment, the stocks could no longer be used. An example is the insecticide dieldrin.
- ❖ Inadequate stores and poor stock management—in poor storage conditions pesticide packaging can become damaged leading to leakage and exposure of the chemicals. The chemicals can deteriorate and become unusable. Poor stock management does not ensure that the oldest products are used first and does not ensure that good records are kept to prevent over stocking for example.
- ❖ Unsuitable products or packaging—sometimes pesticides are supplied in bulk containers which small scale farmers cannot use, or the packag-

ing is of poor quality and has been damaged. In other instances pesticides are supplied in a formulation which local users are unable to apply because they do not have the right equipment.

- ❖ Donations or purchases in excess of requirements—lack of coordination between donor agencies and pesticide suppliers has contributed to over supply of pesticides and the build up of excessive stocks. There are also cases where the actions of pesticide suppliers has led to unnecessary or inappropriate pesticide procurement in developing countries and the supplies have subsequently joined the stocks of obsolete pesticides.

What can be done about it?

Obsolete or unwanted pesticides should generally be disposed of as toxic waste in accordance with standards in industrialised countries. In some cases unwanted pesticides can be used if certain conditions are met. These options require carefully considered expert advice so that the most appropriate action can be taken.

Reuse

Pesticides can only be reused if they meet the following criteria:

- ❖ they have not been banned and are approved for use in that territory;
- ❖ they are in good chemical and physical condition and are still effective as pesticides and will not pose an unreasonable hazard to health or the environment if they are used;
- ❖ there is an appropriate use for the pesticide close to their place of storage;
- ❖ the pesticides are in an appropriate form for local users to handle and apply them.

In some cases, where not all the above criteria are met, pesticides can be transported to another area where they can be used, or they can be reformulated to allow them to be used.

Decisions regarding the chemical and physical state of the chemicals, their efficacy, repackaging, formulation or transport should only be made by specialists in appropriate fields who have access to analytical equipment and other testing facilities. In general these questions should be referred to the manufacturer of the pesticides where they are known, or experienced pesticide chemists, together with independent advisors who do not have a commercial interest in the products or their fate.

Disposal

In the majority of cases, disposal of obsolete pesticides in developing countries entails repackaging, transportation to Europe and incineration in dedicated high temperature toxic

Pesticide disposal: case studies

1 In 1995 the European Commission procured 230 tonnes of the fungicide mancozeb on behalf of Rwanda. The chemical was formulated using cheap and poor quality active ingredient from China. It was shipped to Rwanda and placed in unsuitable storage facilities in the EC compound in Kigali, where it caught fire. The fire was put out but the result was environmental contamination and the creation of a continuing health, environmental and fire hazard.

This situation continued for nearly two years until expert advice was sought to solve the problem. But a local engineering contractor was asked to dispose of the hazardous chemicals and waste, instead of a specialised toxic waste handling contractor.



Pesticide store in Seychelles: damaged packaging, unlabelled containers. Photo courtesy of FAO

2 Nearly 300 tonnes of pesticides at 20 sites across the republic of Yemen were obsolete. Funds raised from the Netherlands Government, the FAO Technical Cooperative Programme (TCP) and Germany totalled US\$1.35 million. The FAO coordinated fundraising, liaison with the Yemen Government, appointment and overseeing of the disposal contractor.

The appointed disposal contractor and specially trained local staff mounted a six week operation to repack obsolete pesticides at the 20 identified sites and to completely decontaminate the stores. The repackaged pesticides were transported overland to a central store from which they were shipped to the UK for specialised high temperature incineration.

waste incinerators. This is a hazardous, difficult and administratively complex operation which requires expert knowledge and equipment. It is also expensive—current costs are US\$3,000-US\$4,000 per tonne of waste.

Other destruction options have been explored including incineration in local cement kilns, mobile incinerators, burial and low technology chemical treatments. Such practices are generally unsafe and inappropriate and in most cases would not be permitted in developed countries for health or environmental reasons. They also need high levels of training, sophisticated equipment and long term maintenance which are often inappropriate in developing countries. Local disposal options should only be implemented on the advice and with the agreement and supervision of independent experts and national authorities.

New technologies are under development including plasma arc, molten metal and

bioremediation. None of these is currently ready for use in developing countries.

What is being done?

The UN Food and Agriculture Organisation (FAO) has taken the lead in developing and implementing appropriate solutions to the problem of obsolete pesticide stocks in the developing world. FAO has carried out a preliminary inventory of stocks in Africa

and the Near East. They have also raised funds and coordinated disposal operations in partnership with other aid agencies in a number of countries. Currently funds are being sought for disposal operations in several African countries.

FAO has also produced a series of guidelines and advice for disposal and for prevention of the accumulation of stocks.

Who will pay?

It is generally agreed that the problem of obsolete pesticide stocks has arisen as a result of the inappropriate actions of many players including donor agencies, industry, governments, advisors and others. To date disposal operations have been funded by some national aid agencies, some contributions from the chemical industry and some international agency money.

Using development aid money for disposal operation seems frustrating and unattractive. However in many cases the presence of toxic obsolete pesticides acts as a hindrance to development, for example where water sources are being contaminated.

It is now widely agreed that all the bodies which contributed to or profited from the creation of the current obsolete pesticides problem—including industry—should contribute to its solution.

The situation being desperate and urgent, disposal of these pesticides is among the national concerns requiring quick action.

*Dr Bateno Kabeto,
Ministry of Agriculture, Ethiopia*

Key points

- ❖ Disposal of obsolete pesticides requires specialist advice.
- ❖ Implementation should be in accordance with FAO Guidelines.
- ❖ International agreements regulate movements of waste.
- ❖ Avoid future problems by ensuring that pesticide procurement is in keeping with FAO and other appropriate guidelines.

Conclusions

Finding solutions to the current problem of obsolete pesticides stocks must also be linked to implementation of measures to prevent such problems from arising again. FAO has published guidelines on the prevention of accumulation of obsolete stocks and on pesticide stock management as part of its work on obsolete pesticides.

All disposal operations require advice from experienced independent agencies and experts. Implementation should be carried out following FAO guidelines, and in conjunction with FAO's office co-ordinating pesticide disposal projects.

There has also been discussion of making the funding and implementation of disposal operations conditional on the recipient country demonstrating that measures are in place to prevent the problem from arising again.

International agreements introduced in recent years are also helping in preventing similar problems from arising. These include the Basel Convention, Bamako and OECD agreements on the cross boundary transportation of toxic waste and the Prior Informed Consent (PIC) agreement on trade in hazardous chemicals.

It is also crucial that donor agencies—including the EU—maintain strict control over the procurement and supply of pesticides to prevent the current problems of obsolete pesticide stocks in developing countries from recurring. Other briefings in this series deal with issues of appropriate pesticide procurement so that hazardous or other pesticides are not over-stocked and then stored.

Resources

Publications

FAO Pesticide Disposal Series:

Prevention and disposal of obsolete and unwanted pesticide stocks in Africa and the Near East. The first FAO consultation meeting. Rome, 1995

Provisional guidelines on prevention of accumulation of obsolete pesticide stocks, Rome, 1995

Pesticide storage and stock control manual, Rome, 1996

Disposal of bulk quantities of obsolete pesticides in developing countries: Provisional technical guidelines, Rome 1996

Prevention and disposal of obsolete and unwanted pesticide stocks in Africa and the Near East. The second FAO consultation meeting. Rome, 1997

International code of conduct on the distribution and use of pesticides (amended version), FAO, Rome, 1990

Provisional guidelines on tender procedures for the procurement of pesticides, FAO, Rome, 1994

Disposal of unwanted pesticide stocks: guidance on the selection of practical options, 1991. GIFAP (from GCPF, Avenue Albert Lancaster 79A, B-1180 Brussels)

Guidelines for aid agencies on pest and pesticide management. DAC guidelines on aid and environment, No.6. OECD, Paris 1995.

Organisations

FAO: the management of obsolete pesticides is complex and hazardous. Only appropriately qualified, experienced and equipped individuals and organisations should deal with them. Advice is available from FAO Plant Protection Service, Plant Production and Protection Division, Viale delle Terme di Caracalla, 00100 Rome, Italy. Tel. +39 6 5705 5192, fax +39 6 5705 6347, email Alemayehu.Wodageneh@fao.org

GTZ (*Deutsche Gesellschaft für Technische Zusammenarbeit*) has wide experience of disposal programmes in Africa. Contact Stephan Krall, GTZ, OE 4232 Pflanzenschutz, Dag Hammarskjöldweg 1-5, D-65760 Eschborn, German, (Tel +49 6196 79 1428; fax +49 6196 79 7173).



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This briefing is one of a series prepared by Pesticide Action Network UK (PAN UK), which is responsible for its contents, as consultants to DGVIII of the EC. PAN UK is an independent charity working to reduce pesticide problems in developing countries. Its quarterly journal *Pesticides News* reports on pesticides and IPM.

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