The SHPF toolkit

A toolkit to help you to monitor and report incidents of pesticide poisoning caused by Severely Hazardous Pesticide Formulations in your country under Article 6 of the Rotterdam Convention

ROTTERDAM CONVENTION

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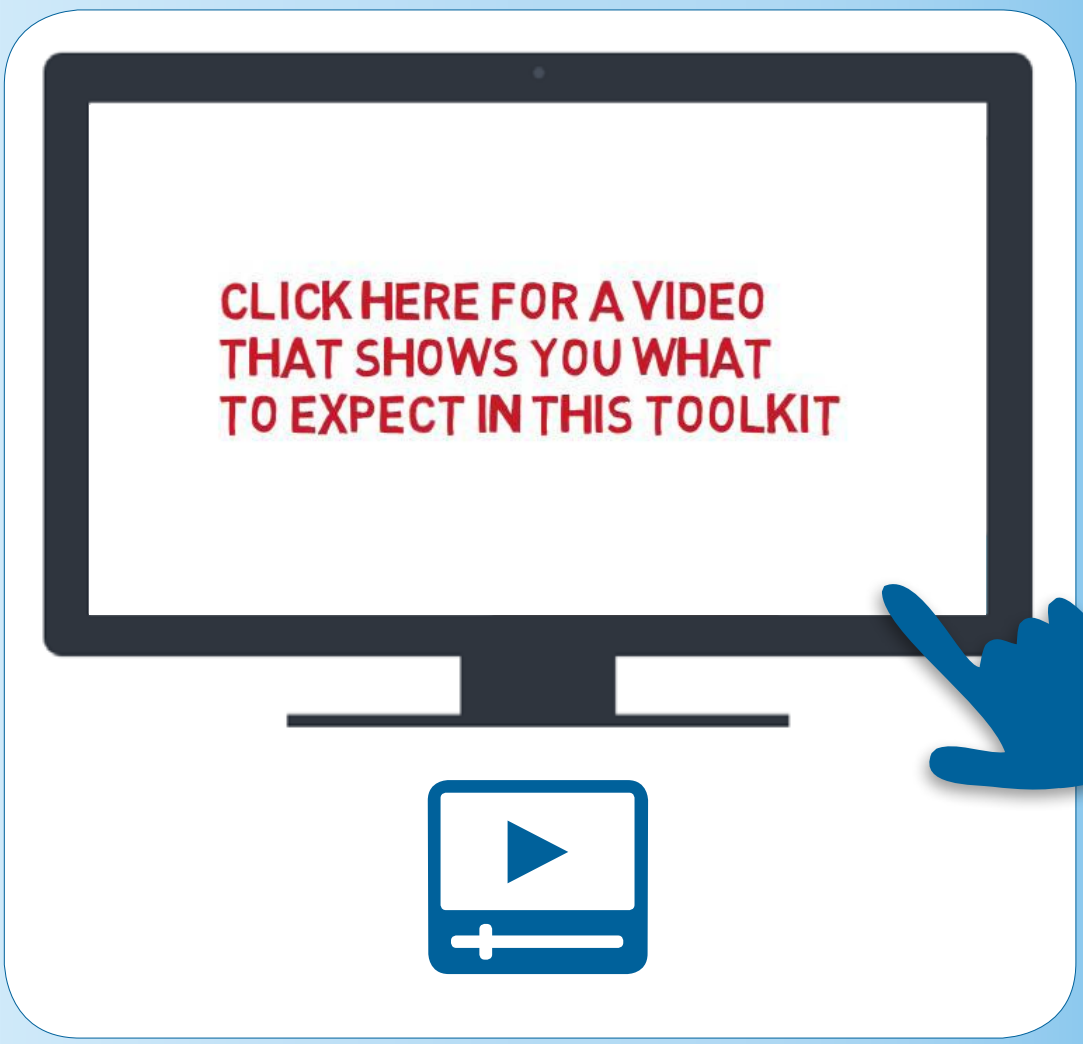
Photo facing page: Evidence of hazardous repacking of pesticides in a shop in Georgia. Photo: PAN-UK.

Section 1
About the toolkit



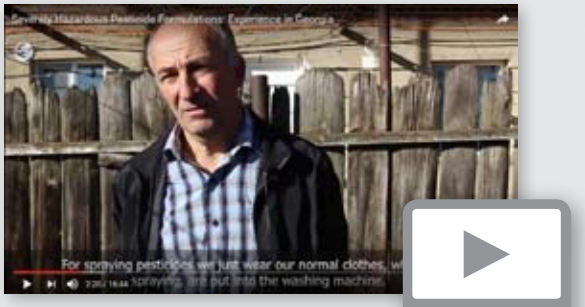
THIS UPDATED TOOLKIT PROVIDES GUIDANCE ON HOW TO MONITOR AND REPORT INCIDENTS OF PESTICIDE POISONING CAUSED BY SEVERELY HAZARDOUS PESTICIDE FORMULATIONS. SUCH INFORMATION IS OF GREAT VALUE AT THE NATIONAL LEVEL AND ALSO HAS THE POTENTIAL TO CONTRIBUTE TO IMPROVED CHEMICALS MANAGEMENT GLOBALLY.

Article 6 of the Rotterdam Convention offers Parties experiencing similar problems with particular pesticide formulations the opportunity to share information and to bring the expertise of the Secretariat and the Chemical Review Committee to bear on such issues. It allows any Party that is a developing country or a country with an economy in transition to propose the listing under Annex III of a severely hazardous pesticide formulation that is causing problems.

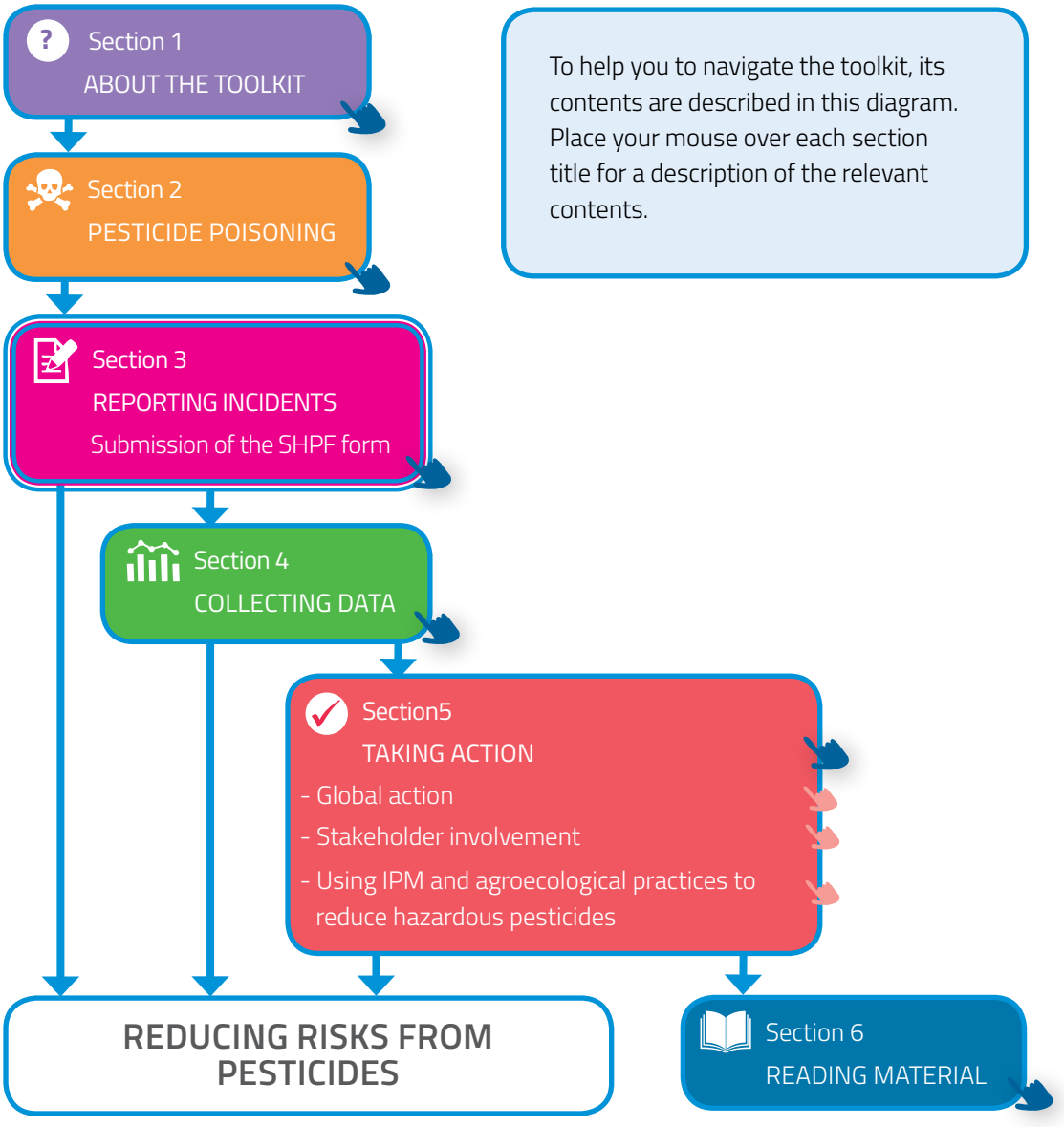
Since the text of the Rotterdam Convention was adopted, a limited number of proposals under Article 6 for listing an SHPF have been submitted. This is despite widespread anecdotal evidence that a number of pesticides cause significant harm to human health and the environment under the conditions of use in many developing countries. Many countries face challenges in meeting their commitments to collect and share data on the impacts of SHPFs. This toolkit is designed to assist Designated National Authorities and others wishing to support the effort to monitor and report health incidents related to pesticide use.

To see how the Rotterdam Convention works please click here.

This updated SHPF kit includes new video resources and case studies designed to share the real experience of people involved in using pesticides and monitoring and reporting pesticide incidents.



COMPONENTS OF THE TOOLKIT



To help you to navigate the toolkit, its contents are described in this diagram. Place your mouse over each section title for a description of the relevant contents.

Navigating through the Toolkit

The tabs at the top of each page can be used to navigate around the Toolkit.

The symbol indicates a link within the Toolkit. The symbol indicates a link to Youtube.

CASE STUDIES

Throughout this toolkit we have illustrated the material with real examples and experience from around the world in video and text formats. This material can be accessed directly through the links provided:

- A case study from Colombia – experience of submitting a proposal to list specific formulations of carbofuran in Annex III
- A case study of a hazardous pesticide – learning lessons from endosulfan?
- Case study in Burkina Faso – implementing an SHPF programme
- Case study in Eastern Europe, Caucasus and Central Asia (EECCA) Gathering information about risky practices and self-reported signs and symptoms of acute pesticide poisoning.
- An interview on community health monitoring and pesticides with Dr Francisca Katagira, Principal Agricultural Officer in the Ministry of Agriculture Food Security and Cooperatives, and Designated National Authority for the Rotterdam Convention, Dar es Salaam, 26 February 2008
- Case study: Experience of phasing out Highly Hazardous Pesticides and promoting alternatives in Costa Rica
- Case study: Increasing biological pest control in cotton
- Case study: Managing Coffee Berry Borer without endosulfan

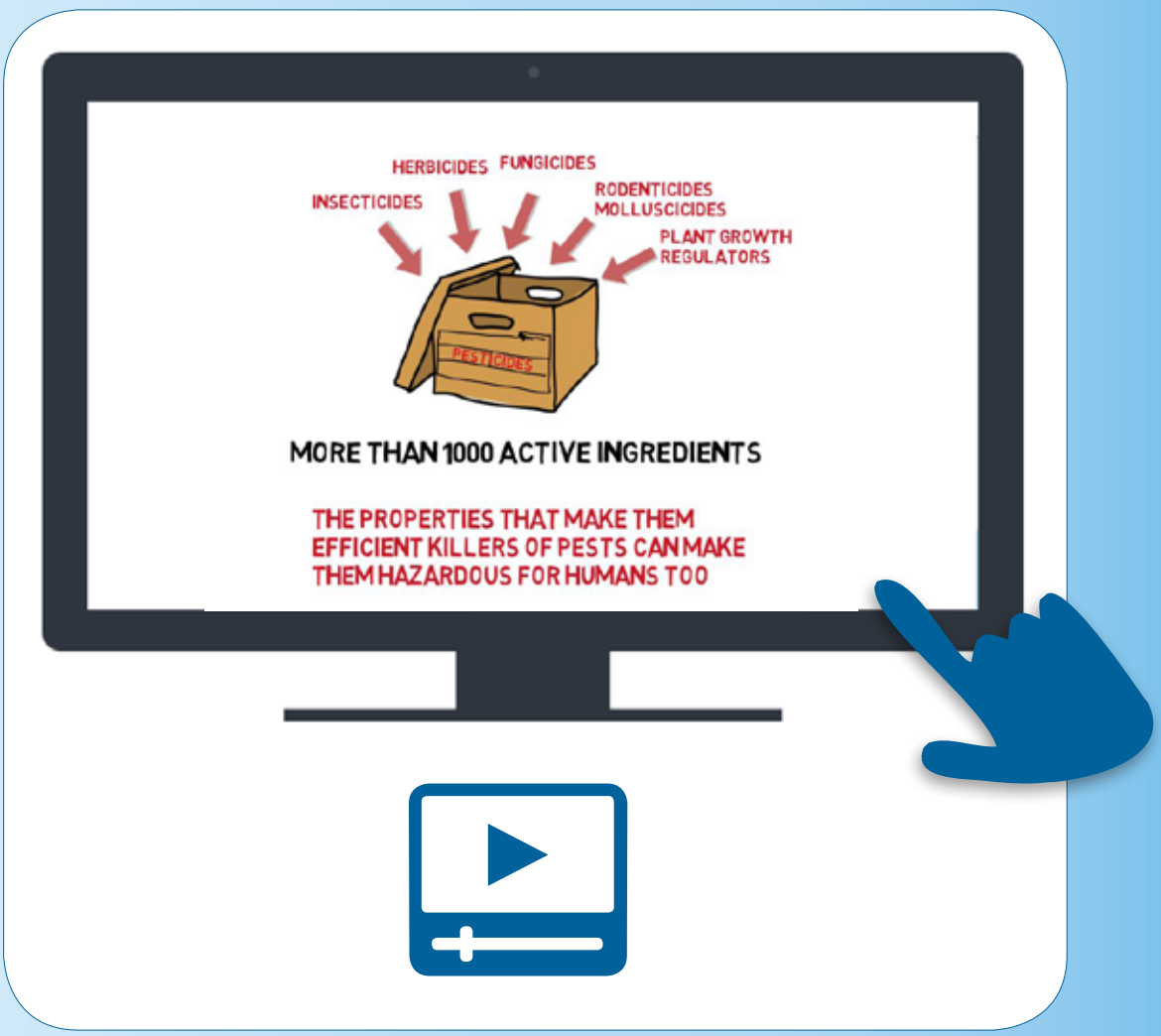
Links to online case studies not included in this document

- A study of Highly Hazardous Pesticides in Mozambique
- Video interview with the DNA of Georgia: Irma Tskvilinisdze shares her experience of submitting SHPF incident reports to the Secretariat of the Rotterdam Convention
- Video case study from Georgia: collecting and sharing information about pesticide exposure, including interviews with farmers; survey team, NGOs, local and national officials, the DNA and The Secretariat to the Rotterdam Convention
- Four videos of farmer experiences managing Coffee Berry Borer without endosulfan





Section 2
Pesticide poisoning



PESTICIDES

The FAO Code of Conduct on the Distribution and Use of Pesticides defines a pesticide as 'any substance or mixture of substances of chemical or biological ingredients, intended for repelling, destroying or controlling any pest, or regulating plant growth.'

When we talk about 'pesticides' we consider more than 1000 active ingredients. The properties that make them efficient killers of pests can make them hazardous for humans too, because pests have biological systems similar to ours. Many organisms cannot break down, or metabolise, pesticides into less harmful substances. Instead, some of these chemicals can remain present in organisms, water and soils for many years.

i The FAO Code of Conduct on the Distribution and Use of Pesticides was first adopted in 1985. The latest version of the Code, which was published as the International Code of Conduct on Pesticide Management by FAO and WHO in 2014, broadened the scope of the Code beyond agricultural pesticides, giving greater attention to health and environmental aspects of pesticides and it is more closely aligned with developments in international chemicals management.

TOXICITY OF PESTICIDES

The toxicity of a pesticide is its capacity to cause injury or illness. The toxicity of a particular pesticide is measured by subjecting test animals to varying dosages of the active ingredient and its formulated products. In some cases, other chemicals mixed with the active ingredient for formulating the pesticide product may affect the toxicity.

Pesticides can be absorbed by ingestion, inhalation and through the skin. Exposure to pesticides can occur at any stage from manufacture and packaging of the pesticide to distribution, storage, use and disposal.

Acute toxicity

Acute toxicity occurs over a short time period. It refers to an incident where a substance causes harmful or lethal effects following oral or dermal exposure to a single dose, or to a multiple dose in a short space of time (24 hours), or an inhalation exposure of 4 hours.

Acute toxicity can result in a range of health impacts, ranging from headaches, dizziness, rashes, gastrointestinal disturbance, lesions, neurological symptoms, convulsions, loss of consciousness, death.

The following boxes illustrate the symptoms associated with common groups of pesticides:

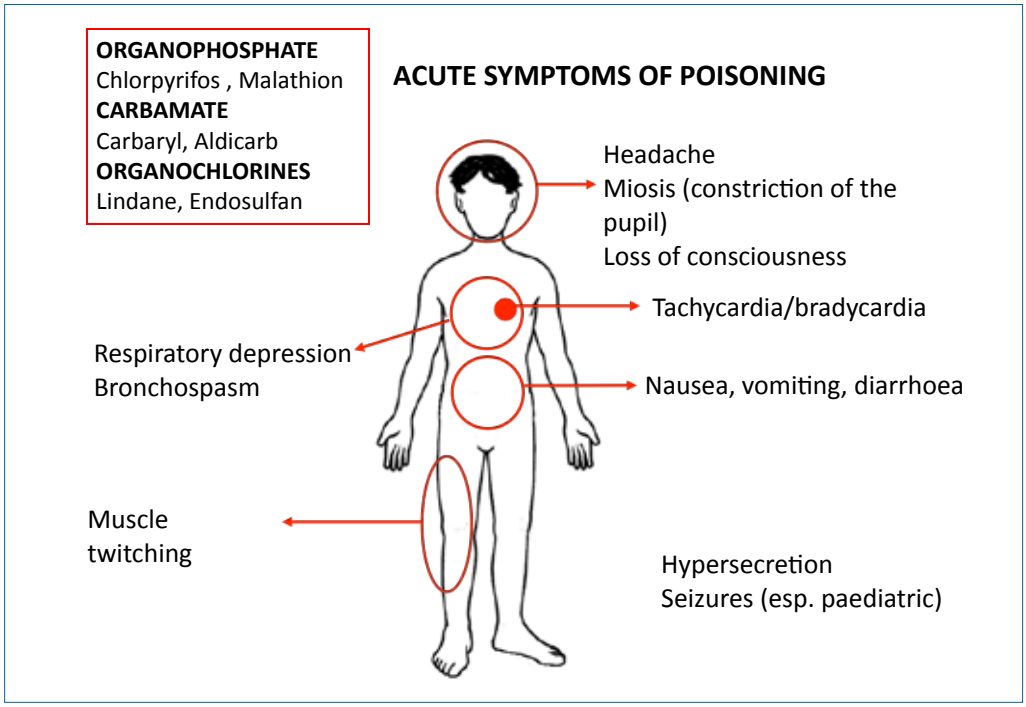


Figure 1. Acute symptoms of poisoning associated with organophosphate, carbamate and organochlorine pesticides.

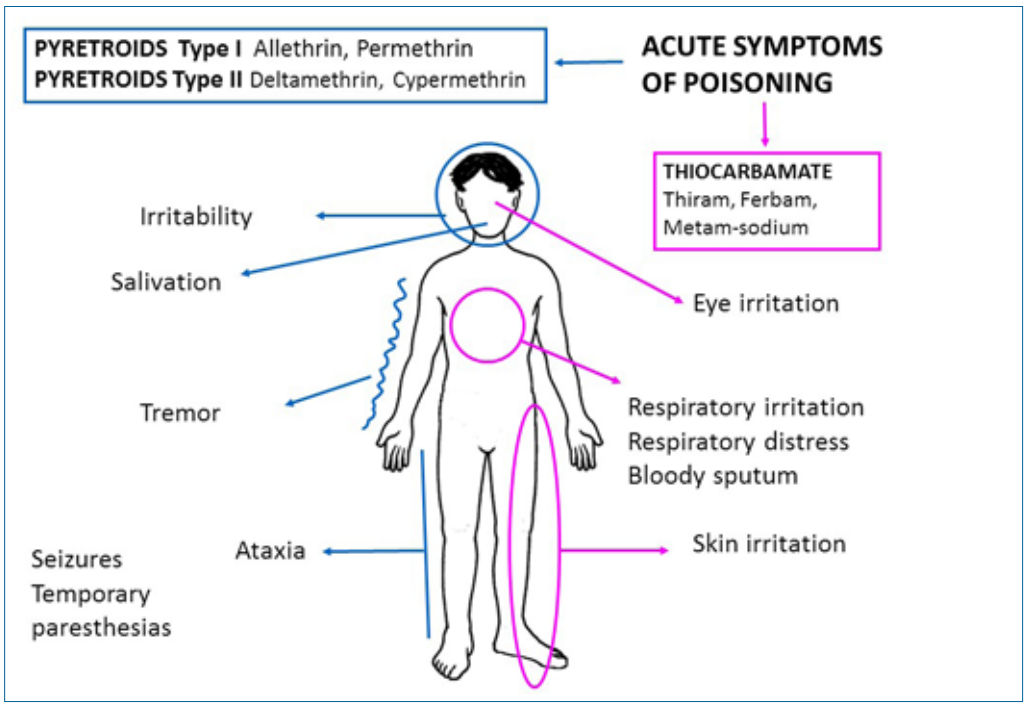


Figure 2. Acute symptoms of poisoning associated with pyrethroid and thiocarbamate pesticides.

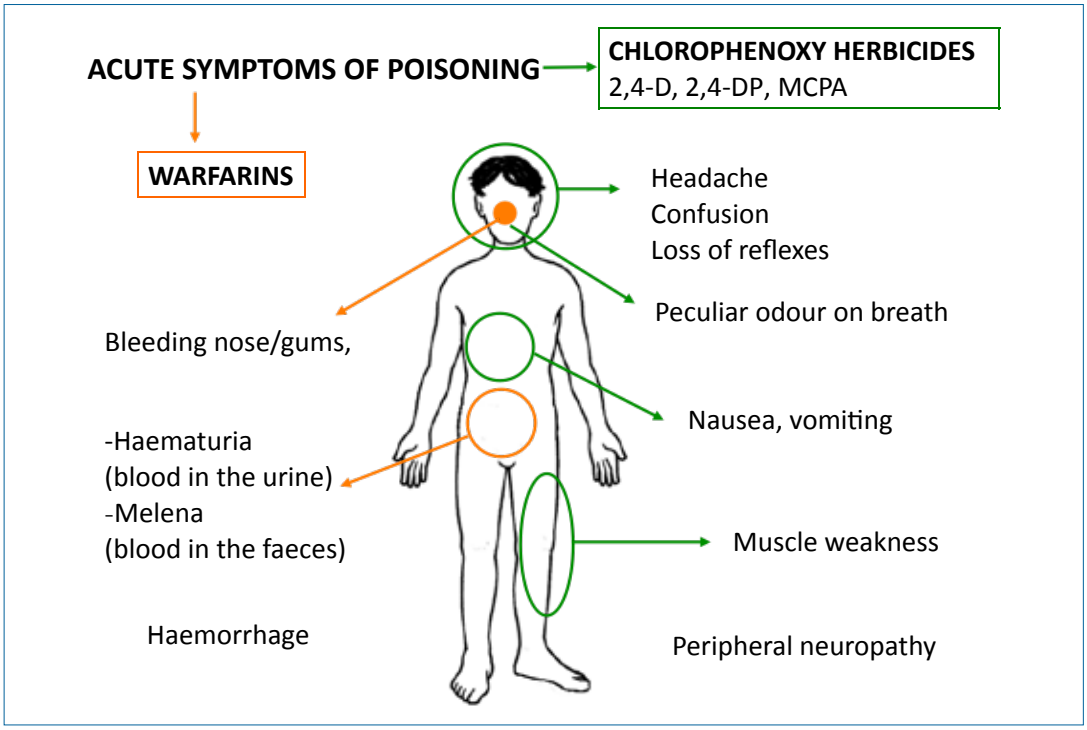


Figure 3. Acute symptoms of poisoning associated with wafarins and chlorophenoxy herbicides.

Long Term Toxic Effects

Long term (or chronic) toxicity occurs when a substance causes harmful effects over an extended period, usually following repeated or continuous exposure. This is commonly associated with occupational exposure or living / working in close proximity to areas where pesticides are used.

Less is known about the chronic toxicity of pesticides, the effects of which may only be discovered years after the exposure. They can include severe, irreversible or even lethal harm such as cancers, foetal abnormality, infertility, developmental effects, endocrine disruption. Long term toxicity has been considered by US, EU and other international bodies and many of these factors are included in the Globally Harmonised System of classification[1].

HOW BIG A PROBLEM IS PESTICIDES POISONING?

According to the World Health Organisation 'Poisoning is a significant global public health problem.' In 2012 WHO estimated 193,460 people died worldwide from unintentional poisoning with the major part being from preventable chemical exposures. Of these deaths, 84% occurred in low- and middle-income countries. WHO estimates that in the same year, unintentional poisoning caused the loss of over 10.7 million years of healthy life (disability adjusted life years, DALYs)[2]. Unfortunately, the proportion of incidents attributable to pesticides is not known. However, WHO report that the estimated annual illness costs of acute poisonings in Nepalese farmers due to pesticide use was nearly one third of total annual healthcare costs. In Parana, Brazil, for each dollar spent on pesticides, approximately US$1.28 may be spent on healthcare and sick leave due to occupational poisoning.

Unfortunately the reported figures, however alarming, do not show the full extent of the problem. Many studies have shown that pesticide poisoning is significantly under-reported. In Central America, for example, the Pan American Health Organization (PAHO) undertook a study in six Central Americal countries which found that only between 1% and 20% of the cases of acute pesticide poisoning are officially reported[3]. Recent studies in Eastern Europe and the Caucasus also indicated that few incidents reach health services or other authorities[4].

COUNTING THE COST

In addition to the human tragedy that results from pesticide poisoning, there are significant economic implications due to loss of labour and the cost of medical treatment. These costs tend to be overlooked in cost/benefit analyses of pesticide use.

A veterinarian visits an incident of suspected pesticide poisoning of cattle. Photo: PAN-UK

In Europe it is estimated that pesticide poisonings cost € 9.7 million per year for hospitalizations, and € 2.5 million for lost work[5,6]. UNEP estimated the costs of lost work, medical treatment, and hospitalizations due to pesticides poisonings among farm workers on small land holdings in 37 Sub-Saharan African countries to be USD 4.4 billion in 2005[7]. This estimate did not include other costs, ' likely to be substantial', including costs of bystander effects, lost livelihoods and lives, environmental health effects, and other effects, such as on farm animals and long term effects of exposure.

DATA - WHO NEEDS IT?

Good policy decisions are based on good information. Monitoring and surveillance data can help your country to target resources more effectively and bring about risk reduction. Collecting data will also help your government to meet its international obligations.

Significant technical advances have been made in the measurement of pesticide risks, which could assist regulators in the future. Section 4 reviews some of the methods being brought to bear on this problem and provides examples and video resources.

> *'Many of us are professionally engaged in quantifying, managing and reducing pesticide risks, and witness the problems that broad spectrum and hazardous pesticides cause on a daily basis. Policy makers, international agencies and other influential groups that could assist in effecting change, are disconnected from this evidence stream, and require quantitative and verified data in order to channel resources and energy towards solutions to this growing problem. Part of our responsibility is to document evidence of impacts.'*
>
> Paul Jepson, Director IPPC, and Professor of Environmental and Molecular Toxicology, Oregon State University.

Testing water quality in Ethiopia. Photo: PAN-UK.

MONITORING OF PESTICIDE IMPACTS IN INTERNATIONAL AGREEMENTS AND CODES

Several conventions and agreements address the monitoring of the impacts of pesticides:

Stockholm Convention on Persistent Organic Pollutants[8]

Article 11 of the Stockholm Convention states that '*parties shall encourage and/or undertake appropriate research, development, monitoring and cooperation pertaining to POPs, including on their effects on human health and the environment; socio-economic and cultural impacts.*'

The FAO/WHO International Code of Conduct on Pesticide Management[9], articles 5.1.3 and 5.1.6 state that governments should:

5.1.3 *carry out health surveillance programmes of those who are occupationally exposed to pesticides and investigate, as well as document, poisoning cases;*

5.1.6 *utilize all possible means for collecting reliable data and maintaining statistics on health effects of pesticides and pesticide poisoning incidents, using harmonized tools where available and submit, where appropriate, the Rotterdam Convention Human Health Incident Report Forms on Severely Hazardous Pesticide Formulations (SHPF), to the relevant designated national authority (34). Suitably trained personnel and adequate resources should be made available to ensure the accuracy of information collected;*

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

The Rotterdam Convention (RC) aims to protect human health and environment by facilitating information exchange about characteristics of various chemicals among all parties. Article 6 of the Convention offers the opportunity for any Party that is a developing country or a country with an economy in transition to share information about any pesticide formulation that is causing problems under local conditions of use, as explained further in Section 3.

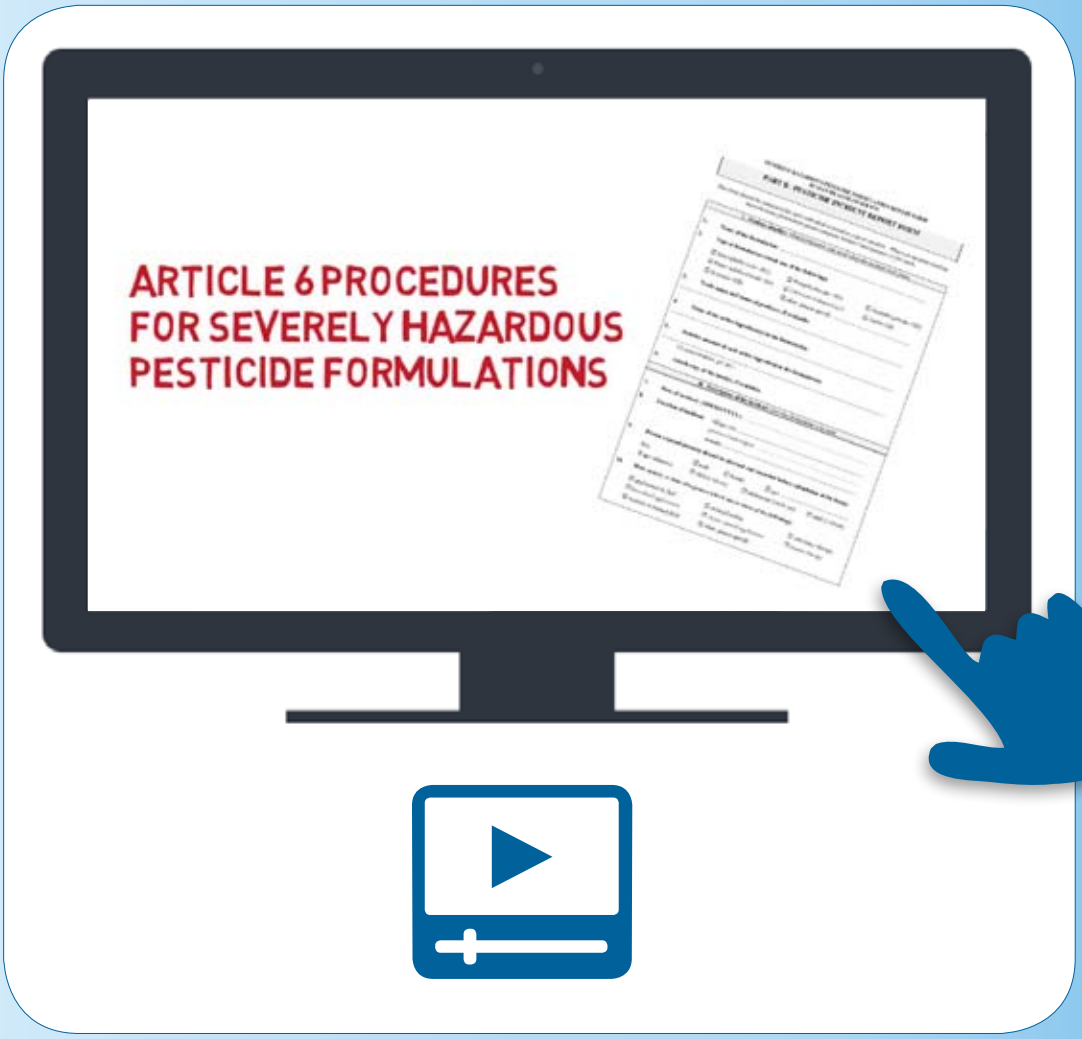
Collecting samples of lake sediment to test for pesticide residues in Lake Ziway, Ethiopia. Photo: PAN-UK

Section 2 Endnotes

1. http://www.unece.org/fileadmin/DAM/trans/danger/publi/ghs/ghs_rev04/English/ST-SG-AC10-30-Rev4e.pdf
2. http://www.who.int/ipcs/poisons/en/
3. Pan American Health Organization. Epidemiological situation of acute pesticide poisoning in the Central American isthmus, 1992-2000. Boleti´n Epidemiolo´gico 2002;3. Available at http://www.paho.org/english/sha/be_v23n3-plaguicidas.htm (accessed 5th December 2016).
4. http://www.pic.int/Implementation/TechnicalAssistance/Workshops/WorkshopGeorgiaOct2016/tabid/5824/language/en-US/Default.aspx
5. http://www.europarl.europa.eu/thinktank/en/document.html?reference=IPOL-JOIN_ET(2008)4085595 Blainey, M., Ganzleben, C., Goldenman, G., and Pratt, I. (2008.) The benefits of strict cut-off criteria on human health in relation to the proposal for a Regulation concerning plant protection products. European Parliament Policy Department Economic and Scientific Policy. Available at: http://www.europarl.europa.eu/RegData/etudes/etudes/join/2008/408559/IPOL-JOIN_ET(2008)408559_EN.pdf
6. Blainey, M., Ganzleben, C., Goldenman, G., and Pratt, I. (2008.) The benefits of strict cut-off criteria on human health in relation to the proposal for a Regulation concerning plant protection products. European Parliament Policy Department Economic and Scientific Policy. Available at: http://www.europarl.europa.eu/RegData/etudes/etudes/join/2008/408559/IPOL-JOIN_ET(2008)408559_EN.pdf
7. UNEP (2013) Report on the Costs of Inaction on the Sound Management of Chemicals http://www.unep.org/hazardoussubstances/Portals/9/Mainstreaming/CostOfInaction/Report_Cost_of_Inaction_Feb2013.pdf
8. 7 Stockholm Convention on Persistent Organic Pollutants website: http://chm.pops.int/
9. FAO/WHO Code of Conduct – 2014 http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf.

Section 3

how to report incidents caused by pesticides in your country under article 6



AN OPPORTUNITY TO WORK TOGETHER TO ADDRESS COMMON ISSUES

Article 6 of the Rotterdam Convention offers parties an opportunity to share information globally and to bring the expertise of the Secretariat and the Chemical Review Committee to bear on such issues. It allows any Party that is a developing country or a country with an economy in transition to propose the listing of a severely hazardous pesticide formulation that is causing problems. By sharing information via the Secretariat of the Rotterdam Convention, other countries can be alerted to potential risks to health caused by pesticides and consideration can be given to regulatory action.

- The Article 6 procedure applies only to the effects of pesticides that are 'observable within a short period of time after single or multiple exposure under conditions of use.'
- The manner of use of the pesticide should be considered typical of common practice.
- Incidents of deliberate self-harm and longer term impacts on health are not addressed.

i A standard incident report form has been developed by the Secretariat to facilitate the collection and submission of data on pesticide poisonings.

The form can be accessed with this link: http://www.pic.int/Procedures/SeverelyHazardousPesticideFormulations/FormsandInstructions/tabid/1192/language/en-US/Default.aspx

Documentation required from a proposing Party

In accordance with Annex IV, part 1 of the incident report form requires a party to include the following information:

a. Name of the hazardous pesticide formulation;
b. Name of the active ingredient or ingredients in the formulation;
c. Relative amount of each active ingredient in the formulation;
d. Type of formulation;
e. Trade names and names of the producers, if available;
f. Common and recognised patterns of use of the formulation within the proposing Party;
g. A clear description of incidents related to the problem, including the adverse effects and the way in which the formulation was used;
h. Any regulatory, administrative or other measures taken, or intended to be taken, by the proposing Party in response to such incidents.

In brief, an SHPF proposal should describe any regulatory action by the proposing party and then present three types of information from the field:

THE INCIDENT
Describe symptoms, exposure (dose, application rate, duration, date); how the person was exposed?

THE LABEL
Provide details of active ingredients, concentration, formulation, manufacturer.

HOW IS THE PRODUCT USED IN PRACTICE?

A standard incident report form has been developed by the Secretariat to facilitate the collection and submission of data on pesticide poisonings.

The form can be accessed with this link: http://www.pic.int/Procedures/SeverelyHazardousPesticideFormulations/FormsandInstructions/tabid/1192/language/en-US/Default.aspx

Article 6 Procedures for Severely Hazardous Pesticide Formulations

The procedures under Article 6[10] can be simply described in a few steps:

1. A Party collects information about problems experienced in their country in relation to a specific pesticide formulation
2. The DNA submits the information to the Secretariat
3. The Secretariat checks whether the information requirements have been met (as outlined in Annex IV, Part1) and informs the Party
4. If there is sufficient information, then a summary will be shared with all Parties through the PIC Circular published in June or December each year
5. The Secretariat collects additional information
6. If the total information is sufficient, it will be forwarded to the Chemical Review Committee for review prior to possible consideration for listing in Annex III

Preparing the proposal:

- Collate data and decide on whether you want to use your own format for reporting to the DNA or want to use Part B of the form
- If the incident is a result of exposure to more than one formulation then the section on Product identity needs to be done separately for each formulation
- Research any other relevant studies to identify other documented experiences of exposure to the relevant chemical
- Research the formulations' status regarding registrations or permissible or restricted uses in other parts of the world
- Provide as detailed a report as possible, using annexes to provide any extra information that you deem relevant. Attach a copy of the label if possible

Collecting information on pest management practices from a coffee farmer in Costa Rica. Photo: PAN-UK.

Tips for preparing a strong proposal

We have asked DNAs and others with experience of this process to tell us what makes a strong proposal under Article VI – and what doesn't. Here are the points they made:

- Provide the original, individual incident reports as well as summary information
- If you have multiple reports concerning the same pesticide, submit details of all of the incidents
- Be clear about the steps you took to gather the information and the methods used
- Make sure you collect information about the concentration of the pesticides and the dosage used
- Provide a timeline of events / actions taken to capture the information provided
- If possible, provide supporting evidence to show that the incident was caused by the formulation you identified, and not by another formulation
- If you have evidence of the severity and/or impact of the incident on the person, that would be helpful

Irma Tskvitinidze, DNA for Georgia describing her experience of submitting SHPF incident reports to the secretariat of the Rotterdam Convention

Colombia's proposal to list specific formulations of carbofuran in Annex III – a case study

In January 2016, PAN-UK interviewed key officials in Colombia to better understand how they completed the information on Carbofuran and to understand any difficulties they faced.

Click here to read the interview

Article 6 and Annex IV of the Rotterdam Convention

The key elements of the Convention that relate to Severely Hazardous Pesticide Formulations are Article 6 and Annex IV. We have provided them here in full for your reference.

ARTICLE 6 EXERPTS

ANNEX IV EXERPTS

Discussing which pesticides are stocked at a farmers' centre in Georgia. Photo: PAN-UK.

EXPLAINING KEY TERMS

What is a Severely Hazardous Pesticide Formulation?

A SEVERELY HAZARDOUS PESTICIDE FORMULATION (SHPF) is a chemical formulated for pesticide use that produces severe health or environmental effects observable within a short period of time after single or multiple exposure, under conditions of use.

NOTE: The Convention Secretariat is interested in receiving information about health incidents related to ANY pesticide, regardless of its WHO hazard classification.

Does 'Severely Hazardous Pesticide Formulation' mean the same as 'Highly Hazardous Pesticide'?

No, a Severely Hazardous Pesticide Formulation is not precisely the same as a Highly Hazardous Pesticide (HHP) but there is some overlap between the two. The definition of an HHP includes pesticides that '*have shown a high incidence of severe or irreversible adverse effects on human health or the environment*' – which overlaps with the definition of an SHPF but, unlike HHPs, they are limited to pesticides that have effects within a short period of time.

What is meant by 'conditions of use'?

'Conditions of use' are common and recognized patterns of use of the formulation within the country. These common patterns of use may not be in line with label instructions, but reflect how the product is really used in practice. An example might be that farmers experience pesticide poisoning when using a product without protective equipment (PPE). If PPE is not usually worn by farmers in the locality, then such incidents would be considered in line with normal conditions of use.

Incidents of deliberate self-harm would NOT be considered under Article 6.

Information relevant to conditions of use:

- Is the formulation registered / permitted for use in the country?
- What uses are permitted?
- Are there any handling or applicator restrictions specified as a condition of registration?
- The extent of use of the formulation, such as the number of registrations or production or sales quantity (indicate the source of information)
- Other information on how the formulation is commonly / typically used in the country e.g. usual methods of pesticide application
- Common practices regarding use of PPE

'Conditions of use' describe the actual circumstances and practices related to pesticide use. Such practices often have a large bearing on the risk of exposure, such as the example below.

Recommended equipment for pesticide spraying.

Showing conditions of use in Kvemo Kartli, Georgia. A woman is applying hazardous pesticides with a brush and bucket. A recent survey found that just 0.02% farmers in the area wear a protective overall when using pesticides and 17% of female respondents said they use a brush and bucket to apply pesticides.

WHAT HAPPENS AFTER AN SHPF INCIDENT HAS BEEN REPORTED TO THE SECRETARIAT?

Once the Secretariat verifies that all the information required for the proposal, as listed in **Part 1 of Annex IV of the Convention**, has been received, it forwards a summary of the information to all parties through the PIC Circular[11], initiates collection of additional information to meet the requirements of part 2 of Annex IV, and then refers the proposal to the Chemical Review Committee (CRC)[12].

The CRC reviews the proposal and recommends whether the pesticide formulation should be included under the PIC procedure and added to Annex III of the Convention. If the CRC recommends its inclusion it will prepare a draft Decision Guidance Document (DGD)[13] that is circulated amongst all Parties.

At the next meeting of all Parties (Conference of Parties - COP) the CRC's recommendations are considered and a final decision is made on whether or not to include the chemical under the PIC process by a process of adoption by consensus. Once a decision is taken to list a chemical under PIC and the DGD is approved by the COP, the information is circulated by the Secretariat to all Parties.

For further information on the CRC procedures, see the *Handbook of working procedures and policy guidance for the Chemical Review Committee*.
http://www.pic.int/TheConvention/ChemicalReviewCommittee/Guidance/tabid/1060/language/en-US/Default.aspx

This video illustrates the whole process as it worked in Georgia from farmers, survey enumerators, NGOs, local and national officials, the DNA and the Secretariat.

Items on sale in a pesticide shop in Moldova. Photo: PAN-UK.

THE PROCESS FLOWCHART

Gather information to propose a severely hazardous pesticide formulation for inclusion under the PIC process.

The proposal for inclusion is presented by the DNA to the Secretariat for review.

If the proposal does not meet the information requirements it is referred back to the DNA.

If the proposal meets the information requirements, its summary is published in the PIC Circular.

The Secretariat initiates collection of information listed in part 2 of Annex IV.

The Secretariat asks the CRC to review the proposal and present their recommendations.

If the CRC decides to recommend the pesticide for inclusion in Annex III they will prepare a draft DGD with their recommendations which is circulated amongst all members.

The next COP will take a final decision. If the proposal is accepted the decision and the approved DGD is circulated amongst all parties.

Parties are supported to make better informed decisions, helping them to strengthen efforts to reduce risks from hazardous pesticides to farming families and communities.

FREQUENTLY ASKED QUESTIONS

Q1. Are we required to ban all uses of a chemical that has been included in Annex III of the Convention?

A1. No. Countries are invited to make their own informed decisions on the use of such chemicals. Chemicals listed in Annex III are subject to the PIC procedure. The purpose is to support countries to make their own decisions on future imports of these chemicals. If a country does not allow import of the chemical, it must ensure that there is no domestic manufacture for domestic use and that no imports of the chemical are accepted from any country.

Q2. Can my country submit an SHPF proposal even though we have not taken regulatory action to restrict or ban the relevant product?

A2. Yes, a proposal can be made without regulatory action having been taken. If regulatory action is under consideration, please share this information with the Secretariat.

Q3. Can the Secretariat help us to complete an SHPF incident form?

A3. The Secretariat does not fill in the information on behalf of a Party, but it can provide detailed feedback on an incomplete form in order to help the DNA understand what is needed to complete it.

Q4. What are the differences between the scope of a notification of final regulatory action and a proposal for SHPF?

A4. The provisions in Article 6 were included in the Convention in recognition of the fact that in some developing countries the conditions are such that certain pesticide formulations can not be used in line with the recommended safety standards. These same formulations may not be subject to regulatory actions that ban or severely restrict their use. in more affluent countries due to wider access to training, protective equipment or other differences in conditions of use. Only a developing country or a country with economy in transition may propose an SHPF and a proposal for an SHPF from only one country is sufficient to initiate review by the Chemical Review Committee.

Q5. Who in a country can submit a proposal?

A5. A proposal can be initiated by anybody who has the detailed information about one or more incidents related to the use of certain pesticide formulations. Part B of the form consists of a series of questions or a checklist for collecting basic information regarding specific incidents in the field. This information should be forwarded to the DNA who will then complete Part A of the form and submit both parts to the Secretariat.

Q6. Is there any link to other incident report programmes?

A6. Countries are encouraged to link the provisions in Article 6 of the Convention to existing programmes, such as the WHO INTOX programme, in order to make use of available resources. If there are other report forms available that meet the information requirements of Parts 1 and 3 of Annex IV of the Convention, they may be used instead of Part B of the form.

TECHNICAL ASSISTANCE

The Secretariat, upon request, can provide assistance to bring together actors and stakeholders to develop a national system for pesticide incident data collection, monitoring and reporting.

The Secretariat offers assistance for reporting on pesticide incidents to Parties who are developing countries or countries with economies in transition. The technical assistance programme for SHPFs brings together national stakeholders such as government ministries, NGOs, farmers, academia and others to define objectives, financial resources, target groups, and other aspects of an incident reporting system. The programme usually involves collecting data in the field, monitoring and reporting on pesticide incidents involving severely hazardous pesticide formulations to the Secretariat.

The approach so far has been to either conduct a survey to gather information on poisoning incidents, or to develop a community based monitoring system. The Secretariat is able to adapt the programme based on national needs.

To request assistance for such activities, you can contact the officers of the Secretariat in Rome. You will find the email addresses on the RC website at www.pic.int/Secretariat/Contact/tabid/1310/language/en-US/Default.aspx.

When you work with the Secretariat you will be requested to develop, in collaboration with the RC officer, three useful documents:

- A concept note outlining the work you are planning
- A simple work plan
- A budget

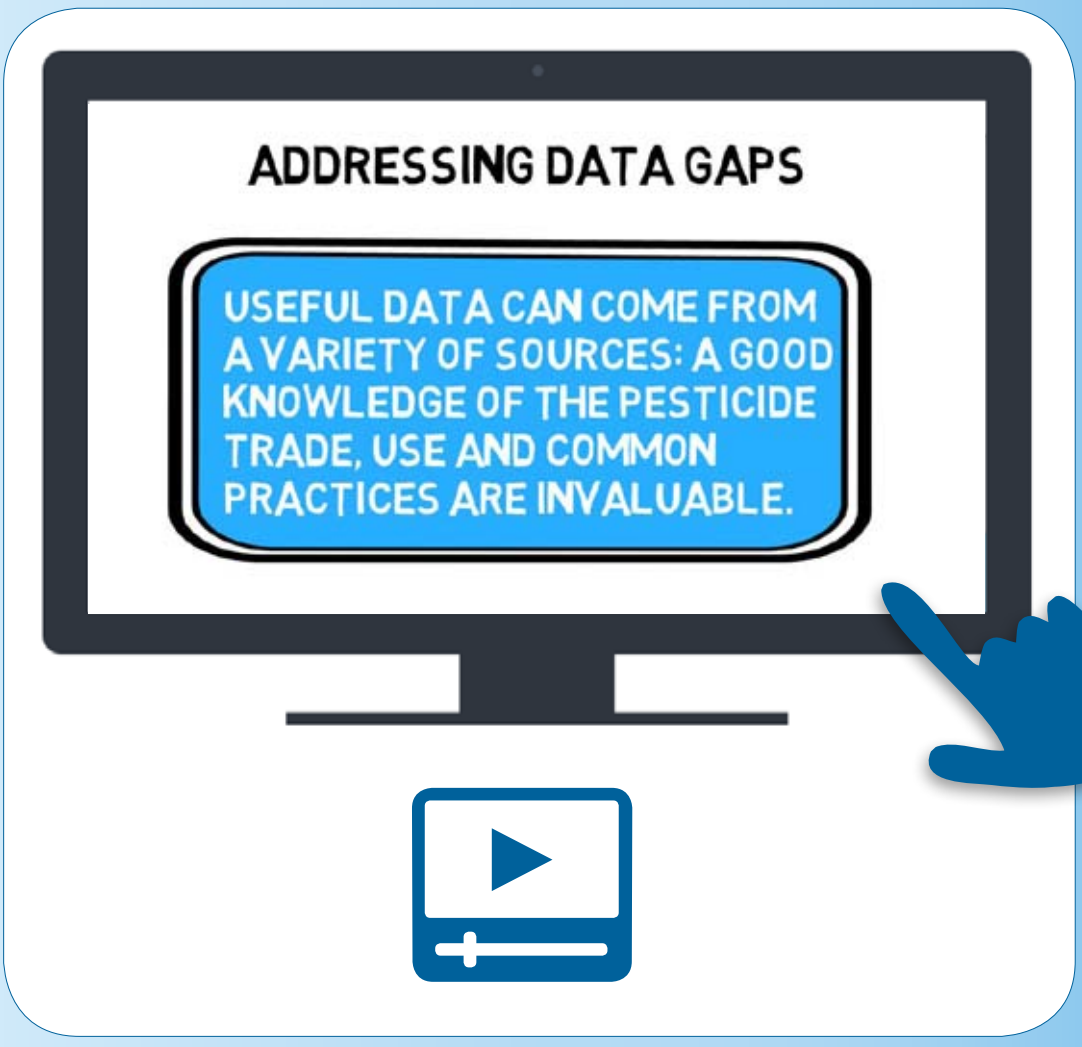
We have provided templates for each of these documents, but they are suggestions only. There is no set format for these documents.

Section 3 Endnotes

10. http://www.pic.int/Procedures/SeverelyHazardousPesticideFormulations/tabid/1191/language/en-US/Default.aspx
11. A bi-annual document that is critical to the implementation of many sections of the RC as it provides a platform for information sharing across all Parties and other interested stakeholders worldwide.
12. The Chemical Review Committee is a body of the experts appointed by the COP to review SHPFs and make recommendations to the Parties for listing.
13. Draft Decision Guidance Document is the report submitted by the CRC with its recommendations on the proposed pesticide formulation or chemical to the Parties.

Photo facing page: Cotton farmers in Benin gather to discuss pest management issues. Photo: PAN-UK.

Section 4
Collecting information on incidents



INTRODUCTION

Pesticide poisoning is a major public health problem in developing countries, but it is poorly understood. Better information is needed to strengthen decisions regarding the reduction of risk from pesticides and to make effective decisions regarding the allocation of limited resources.

Useful data can come from a variety of sources. A good knowledge of pesticide trade, use and common practices are invaluable. Which products are associated with particular health impacts? How are those products used? On which crops / pests? How are people being exposed? Do most end users follow label safety instructions?

> i A lack of reports of pesticide poisoning incidents does not mean that they don't happen. Be proactive.

Local medical centers can be a good place to start gathering information. However, many studies have shown that only a small proportion of poisoning incidents are reported to health services or other authorities. Even incidents that are presented to health services are often misdiagnosed and/or mis-recorded. It is unusual to have good systems in place to collect the necessary information from such incidents. Additional work is needed. Communicating directly with end users of pesticides and the wider community can be very valuable for gaining a better understanding of the scale of the problem and the circumstances that lead to pesticide poisoning.

In this section we will suggest different methodologies and share experience which we hope will help you to collect useful information on incidents of pesticide poisoning in order to inform efforts to achieve pesticide risk reduction.

COLLECTING RELEVANT INFORMATION FROM PUBLISHED REPORTS

A valuable first step is to collect relevant information that has already been collected on incidents of pesticide poisoning or current practices. Find out about relevant work going on in government institutions, universities, NGOs. To reduce workload, you could prioritise information collected in the last five years or so, only including older studies that are highly relevant.

Useful background information:

Background information provides important context for specific incident reports, for example:

- Key crops – where grown, economic importance, main pests, common pest control practices
- Pesticide import and national sales statistics; preferably product specific
- Pesticides available and in common use in the country – active ingredients and product formulations including availability of banned and restricted products
- Pesticide usage (amounts and for which pests / crops) and pesticide practices (e.g. methods of application; safety standards)
- Pesticide management – particularly any weaknesses that may increase risk of pesticide exposure at farm or community level e.g. illegal trade; lack of quality control; repackaging into unsuitable containers; re-use of pesticide containers; poor access to protective equipment; low level of literacy or labelling in languages that are not read by end users
- Pesticide exposure - who usually sprays pesticides? Men? Women? Children? Seasonal workers?

Monitoring the impact of pesticides on aquatic invertebrates in Ethiopia. Photo: PAN-UK

You may find that a national institution or other organisation has undertaken sampling and analysis of foodstuffs. Perhaps the health services record some relevant data on pesticide poisoning? Agricultural institutions and extension services may hold information regarding the types of pesticides in use on particular crops. All these types of information help to build a more complete picture of the situation. The sources of information may include scientific literature; official data and reports; industry reports; news reports; quotes from relevant individuals. You may find helpful statistics from World Bank, FAO or other online sources. e.g. FAOSTAT[14] http://www.fao.org/faostat/en/#data/RP

Pesticide hazard

Understanding the difference between 'a hazard' and 'a risk' is important. A hazard will not pose a risk to you unless you are sufficiently exposed to cause harm. Risks associated with hazards can be reduced by reducing exposure.

To use a simple illustration, most of us are not at high risk from being eaten by lions because we have very little exposure to them, however hazardous they may be. The lion tamer is at greater risk because of the greater level of exposure!

hazard x exposure = risk

Since risk is a function of both exposure and hazard, it is important to gather information on both aspects of a pesticide. The volumes and manner of use of pesticides will give some indication of which products people are likely exposed to. It is also vital to determine which products are most hazardous e.g.

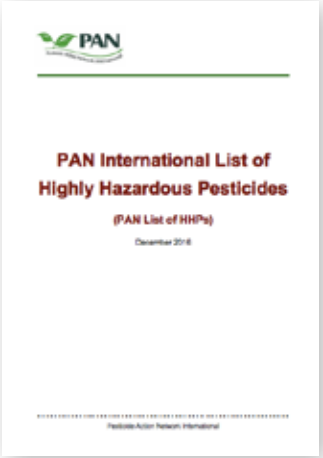
- The chemical and toxicological profile of the pesticides available in country and their known effects
- The type of recommended treatment of poisoning for these products and availability of such treatment

Sources of useful information on pesticide hazard

FAO Pesticides Registration Toolkit

Under the 'Information sources menu' of the FAO Pesticides Registration Toolkit, you will find useful links to information on individual pesticides. This includes databases of registered pesticides, scientific reviews of pesticides, maximum residue limits, pesticide properties. The Toolkit, which is regularly updated, provides annotated links to relevant web sites. http://www.fao.org/pesticide-registration-toolkit/tool/home/

Highly Hazardous Pesticides (HHPs)



Over the last few years, FAO and WHO have supported the preparation of lists of HHPs by some countries based on the criteria agreed at the Joint Meeting on Pesticide Management in 2008 (as explained in Section 3). PAN International produces a similar but more comprehensive list, including additional criteria used by recognised authorities, such as the EU and the US Environmental Protection Agency (EPA). Pesticides with endocrine disrupting properties, eco-toxicological properties, or inhalation toxicity are included in the PAN list of HHPs. The list is regularly updated. You can find the latest version, with explanations of criteria used, here: http://pan-international.org/wp-content/uploads/PAN_HHP_List.pdf

Other hazard classifications

GHS	GHS Rev.6 (2015)
WHO Classification	WHO Classification of Pesticides by Hazard
WHO – International Agency for Research on Cancer (IARC)	Agents classified by the IARC monographs
International Chemical Safety Cards (ICSC)	ICSC database search
Highly Hazardous Pesticides	FAO Guidelines on Highly Hazardous Pesticides
EU Pesticides Database	EU Pesticides Database
European Chemicals Agency (ECHA)	C&L Inventory
US EPA carcinogenicity evaluation	Databases for Chemical Information
New Zealand – CCID	Chemical Classification and Information Database

Monitoring / surveillance data

Leslie London of the University of Cape Town describes surveillance as a critical public health tool for the control of pesticide poisoning[15] and suggests that the major sources of surveillance data usually lie in the health sector, but offices of labour / home affairs could also be a useful source of information about work-related morbidity and mortality and cause of death data derived from death certificates. These records could indicate age, gender and location of the people who suffered from pesticide poisoning.

Incident reports may originate from many different institutions or individuals, but a number of primary sources should, if available, be taken into account:

- notifications from medical practitioners
- death certificates
- data gathered by poison control centres
- data from government ministries which have responsibilities for labour (work-related morbidity and mortality); agriculture (crop protection related morbidity and mortality); public health (vector control related morbidity and mortality); environment (incidents of environmental contamination or adverse environmental effects)
- information on suspected poisoning cases collected by emergency telephone hot-lines, either operated by a national poison control centre or individual pesticide companies
- Vulnerable groups (e.g. women, children, seasonal workers)

Gathering new information from stakeholders

There is no substitute for approaching key people directly to understand the issues that lead to pesticide exposure, the impact it has, and to identify suitable solutions. The following stakeholders could be involved in group discussions and/or consultations:

- Farmers' organizations
- Pesticide retailers and pesticide trade organisations
- Groups or networks representing high risk / vulnerable groups e.g. rural women, rural youth services, trade unions
- Ministry of Agriculture, including plant protection, extension services, pesticides regulator
- Ministry of Health and health services in your target area
- Ministry for Environment
- Food safety authority
- Ministries of Labour and social affairs
- Universities and research institutes
- Customs services and other relevant enforcement agencies

Stakeholders from Georgia, Moldova and Belarus discuss common routes of pesticide exposure. Photo: PAN-UK.

Group discussions

The aim is to have an open discussion on key topics in order to draw out information on key issues. The skill is to focus the discussion on the topics in a way that draws in all participants, helping everyone to contribute and not just the most confident members of the group.

Tips for group discussions

- The group should ideally include 6-8 people. A larger group can be difficult to manage
- Ensure that participants' expectations are managed honestly and appropriately. Any incentives should be minimal and appropriate e.g. information resources; basic refreshments.
- You need one facilitator and one person to record key points
- Have a short list of topics that you want to cover in the discussion, but allow other relevant issues to emerge
- Prepare key questions in advance and be sure to present them in a way that opens discussion and does not indicate a 'correct' answer
- Do not express your judgement
- Stick to the agreed time limit on the discussion
- Explain how the information from discussions and surveys will be used and how participants will hear the results

Suggested topics for discussion (these topics will vary, depending on the participants)

- Key crops
- Pesticide use – quantity, types of products, uses (key pests)
- Who applies pesticides - men, women, students, children, landowners, seasonal or migrant workers?
- How pesticides are applied
- Safety equipment
- Where pesticides are purchased (licenced / unlicenced premises) and application equipment is maintained, cleaned and stored
- Are pesticides decanted / repacked by retailers?
- Containers and labels – what type of containers are pesticides stored in on the farm? Are labels present? Are labels in the language of the end users?
- Where do pesticide users get advice on pesticides?
- Common physical complaints after pesticide use (e.g. rashes, headaches, weakness)
- Any other known incidents of pesticide poisoning
- Where such problems might be reported (if at all)
- Use of domestic pesticides e.g. for rodent control
- Who might be exposed (directly or indirectly) to pesticides and how
- Exposure routes e.g. during mixing, loading or spraying; walking to work / school; in the garden; harvesting or processing produce; washing contaminated clothes

Community Pesticide Action Monitoring; CPAM

Community Pesticide Action Monitoring is a community-based process of documenting the effects of pesticides. Community Pesticide Action Monitoring, or CPAM[16], was developed by PAN Asia Pacific in the 1990's as a tool to document and create awareness of pesticide impacts. PAN AP and its team of trainers have progressively improved the training methodology and documentation so that it is easily adapted to different situations and cultures. CPAM is done with informed and consenting communities (including women and marginalised or vulnerable groups), based on Participatory Action Research. It is designed to inform and mobilise affected communities.

The process is based on questionnaires which can be completed by 'outsiders' during interviews (in close consultation with the community); or by communities themselves. The format can be written questionnaires and / or simple illustrated self-surveillance cards e.g. on pesticide use and specific health symptoms. Blood testing and medical investigation can complement the recording of symptoms.

External partners are accountable for providing legal or medical support and sharing alternatives (such as biodiversity based agroecology and IPM) if needed.

So far, ten countries in Asia have used the CPAM approach.

"Pesticides are a growing concern here in Asia as women and children are seriously impacted by the long term impacts of pesticides. With CPAM, communities are empowered to take action and address their solutions through national policy advocacy and move towards more sustainable agriculture like agroecology. Results of CPAM documentations are also used for regional and global policy advocacy for the global ban of highly hazardous pesticides"

Deeppa Ravindran, Programme Coordinator,
PAN Asia Pacific.

CPAM and Malaysian plantation workers

CPAM was used by PANAP with Malaysian plantation workers. They were supported to document the health effects of the pesticides they were using. Through this process, workers identified paraquat as a major health problem. Their conclusions were criticised by the industry and some experts as having insufficient scientific basis. Indeed there were many uncertainties as far as any causal relationship. However, using the precautionary principle, the plantation workers and their supporters proceeded to take action to prevent further exposure of plantation workers to paraquat. This led to a campaign calling for safer working conditions. In 2002, the Malaysian Pesticide Control Division banned paraquat with a phase-out period of two years. The ban was later lifted in response to requests by the plantation companies, but has recently been reinstated to become effective in 2020.

Reported by Romy Quijano from Pesticide Action Network Asia Pacific (PANAP)

Using pesticides without suitable protective equipment. Photo: PAN-UK.

A FARMER SELF-SURVEILLANCE SYSTEM OF PESTICIDE POISONING

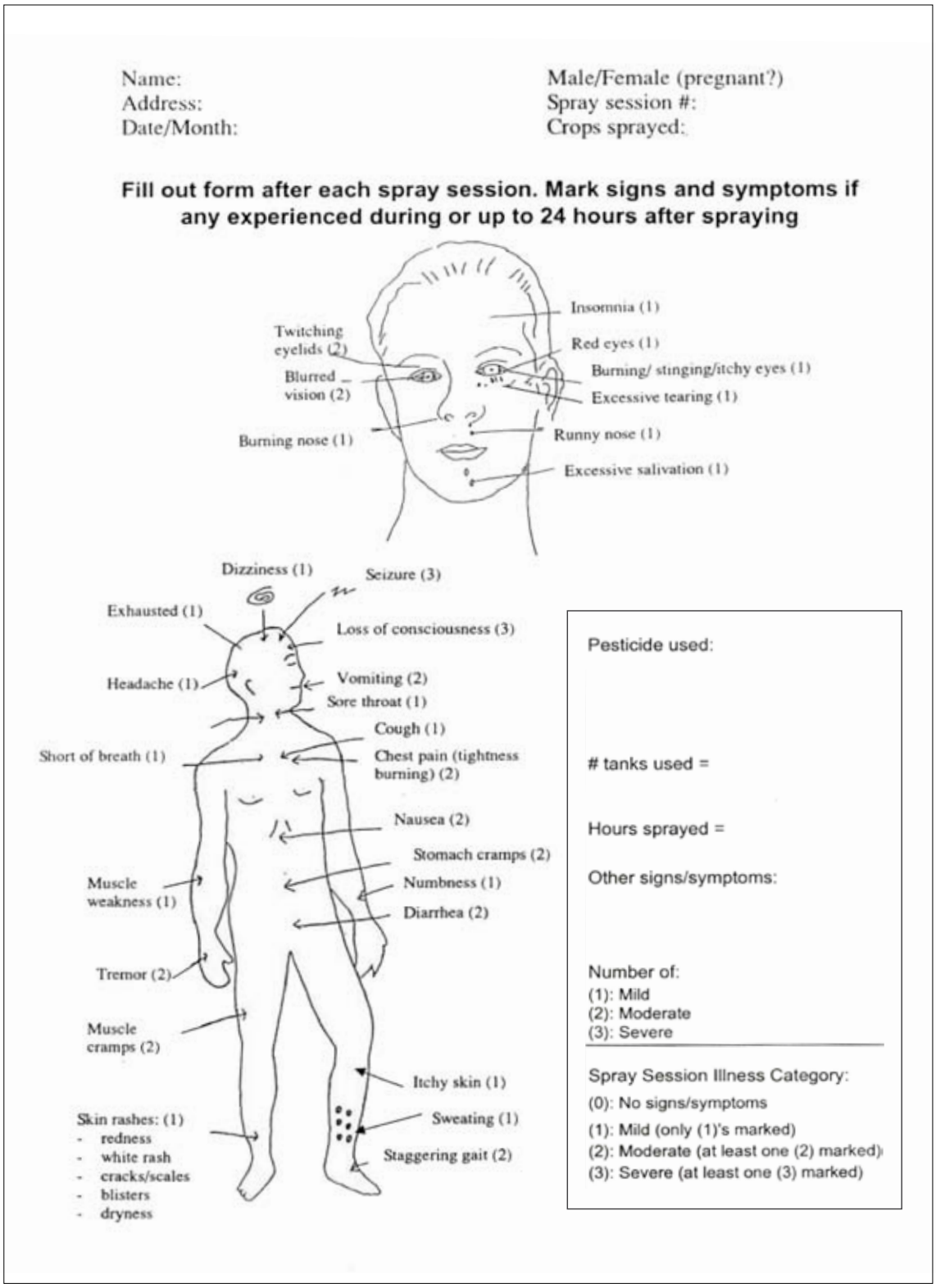
The Food and Agriculture Organization of the United Nations Integrated Pest Management Programme for Asia (FAO/IPM) has developed a simple means for farmers to self-report signs and symptoms of pesticide poisoning after each spray session[17].

Trained community members (farmer field graduates) collect the forms weekly. They then summarize and present the data back to the participating community for discussion on a monthly basis. A local physician attends each of these meetings and adds any pesticide poisoning cases seen in the local clinic from the proceeding month. This method has been successfully tested in North Vietnam. It yields the following data:

- The average number of spray sessions per person per month (this will reflect the impact self-reporting has on spray frequency)
- The number of minor, moderate and serious signs and symptoms per spray session
- Percentage of spray sessions associated to none, mild, moderate or serious poisoning
- Types of pesticides used per month
- Number of cases seen in the local health facility

At the end of the surveillance period, a meeting should be held for the community to discuss their problems with pesticides so that they can make some decisions about future use.

Farmers in Kyrgyzstan draw maps to facilitate discussion of pesticide practices and common exposure scenarios. Photo: PAN-UK.



Name:
Address:
Date/Month:

Male/Female (pregnant?)
Spray session #:
Crops sprayed:

Fill out form after each spray session. Mark signs and symptoms if any experienced during or up to 24 hours after spraying

Pesticide used:

tanks used =

Hours sprayed =

Other signs/symptoms:

Number of:
(1): Mild
(2): Moderate
(3): Severe

Spray Session Illness Category:
(0): No signs/symptoms
(1): Mild (only (1)'s marked)
(2): Moderate (at least one (2) marked)
(3): Severe (at least one (3) marked)

A sample body mapping form used in conjunction with practical training[18].

VULNERABLE GROUPS

Everyone is not equally exposed to the impacts of pesticides. It is important to identify vulnerable groups and understand the causes of their particular vulnerability to pesticide poisoning and ways that their risk may be reduced.

Farmers and agricultural workers

In general the most exposed category of people are farmers and agricultural workers because they directly handle pesticides and they live and work in the vicinity of sprayed crops and other sources of contamination.

People living near crops where pesticides are used

Farmers' families and workers living near crops can be exposed to pesticides in a variety of ways. They may, for example: be exposed to spray drift, touch or handle sprayed crops or produce, wash in or drink contaminated water, handle contaminated containers or clothing.

Seasonal and migrant workers

Seasonal agricultural workers can be exposed to pesticides in much the same ways as other farm workers. Additional factors may increase their vulnerability to pesticide poisoning. They may have less access to information or training, for example, which can hamper their ability to evaluate and minimise risks. They often have less control over working and living conditions and poorer access to protective equipment. Lack of security in employment may undermine their ability to demand safer conditions. Poor quality accommodation located within the farm may increase exposure (see previous paragraph). Access to healthcare may also be limited. If they are migrants, language also be a barrier to label and safety information.

Seasonal or migrant workers may not feel comfortable reporting working conditions and symptoms of pesticide poisoning they have experienced. They may be concerned about upsetting an employer, for example. They should be interviewed at a time and place where they are comfortable to talk openly and by someone who speaks their language.

Women

Women workers can be especially vulnerable for social and physiological reasons. Women are often part-time or seasonal workers. They may not receive the same levels of information, training and protection as other workers. There are also physiological differences in the effects of pesticides on men and women. Pregnant and breastfeeding mothers are even more vulnerable. Some pesticides can pass through the placenta and contaminate the foetus; pesticides can also pass through breastmilk to a nursing infant.

i It is necessary to take account of cultural sensitivities. In some communities, for example, women do not speak to male interviewers unless a male relative is present. It can be preferable to use female interviewers to elicit good information from women.

Farm workers in Georgia at a meeting to discuss pesticide practices. Photo: PAN-UK.

WHAT TO ASK?

As explained in section 2, the Secretariat of the Rotterdam Convention has developed a short form for reporting on human health incidents related to an SHPF.

The form can be accessed with this link:
http://www.pic.int/Procedures/SeverelyHazardousPesticideFormulations/FormsandInstructions/tabid/1192/language/en-US/Default.aspx

You may wish to add a few questions in order to get broader information about some common sources of pesticide exposure:

Water contamination by pesticides

- *Is there an open fresh water source (river, pond etc.) in or adjacent to the fields being treated with pesticides?*
- *What is the water being used for? (Drinking, washing, fishing, swimming)*

  Why these questions? Because a fresh water source can be polluted by pesticides used nearby. Drinking contaminated water, or swimming in it, or eating fish living in polluted water can represent a source of contamination for humans.

A child in Benin plays with containers, including used pesticide bottles. Photo: PAN-UK.

Empty containers

- *What happens to empty pesticide containers on your farm?*

  Why this question? Because empty pesticides containers can be re-used for drinking water for humans or animals or for other domestic purposes putting at risk of poisoning people who use them.

Ingestion

- *Do you sometimes eat, drink or smoke while handling pesticides?*

  Why this question? Because touching the mouth with contaminated hands can lead to poisoning by ingestion.

Laundry

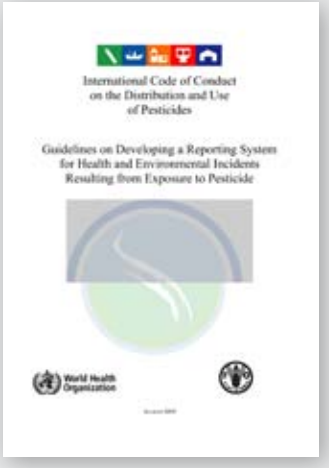
- *Do you wash by hand clothes that have been used while handling pesticides?*

  Why this question? Because clothes worn while applying pesticides are contaminated. Washing them by hand means that the pesticides on the clothes are diluted in water and are a source of dermal contamination. Washing clothes is often regarded as a woman's task and is often a "hidden" source of exposure. Washing contaminated clothing with family laundry can also contaminate other clothing, including children's clothes.

Sources of additional guidance on establishing a basic reporting program on pesticide incidents

- FAO/WHO (2016) Guidelines on Highly Hazardous Pesticides. http://www.fao.org/3/a-i5566e.pdf

- FAO/WHO [2009] Guidelines on developing a reporting system for health and environmental incidents resulting from exposure to pesticide, Food and Agriculture Organization of the United Nations and World Health Organization. http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/Incidentreporting09.pdf

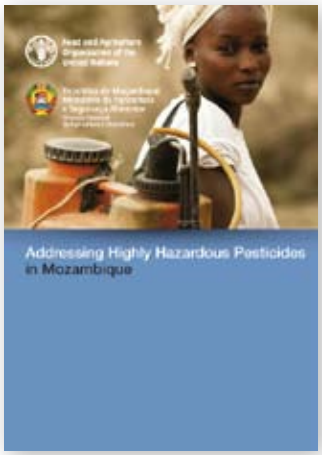


Case studies

A study in Mozambique

On August 26, 2014, the Government of Mozambique cancelled the registrations of 61 pesticide products containing 31 different active ingredients. The Government also announced risk reduction measures for another 52 pesticide products. This concluded a 2-year FAO project to identify the Highly Hazardous Pesticides (HHPs) authorized for use in Mozambique and develop a risk reduction plan. The project was prompted by the Government's concern about the use of hazardous pesticides and its desire to promote sustainable intensification of agricultural production. The project was also intended to serve as a pilot for other countries and for future FAO guidelines.

The project was supported by the Mozambican Ministries of Agriculture and Environment and the Strategic Approach to International Chemicals Management (SAICM) under the Quick Start Programme. It included numerous interviews with farmers and consultations with representatives of commodity companies, the agro-chemical industry, and civil society. The good cooperation with these stakeholders and their support for the project were central to its success.



A brochure, describing the process that was followed in Mozambique and the positive results of the project, can be found here: http://www.fao.org/3/a-i5360e.pdf

Cotton farmers in Ethiopia gather to discuss pest management practices. Photo: PAN-UK.

Learning lessons from endosulfan?

The journey of endosulfan from development to eventual listing by the Rotterdam and Stockholm Conventions was a long one. Are there lessons that we can learn and apply to other hazardous pesticides?

Click here to read more.

Case study in Burkina Faso

The Secretariat of the Rotterdam Convention implemented a SHPF pilot programme in Burkina Faso in 2010, providing technical and financial assistance.

Click here to read more.

Case study in Eastern Europe, Caucasus and Central Asia (EECCA)

The project was conducted in 2014/2015 in six countries in EECCA and gathered information about risky practices and self-reported signs and symptoms of acute pesticide poisoning.

Click here to read more.

An interview with Dr Francisca Katagira, Principal Agricultural Officer in the Ministry of Agriculture Food Security and Cooperatives, and Designated National Authority for the Rotterdam Convention, Dar es Salaam, 26 February 2008.

Click here to read more.

Section 4 Endnotes

14. The Pesticides (use) database in FAOSTAT includes data on the use of major pesticide groups (Insecticides, Herbicides, Fungicides, Plant growth regulators and Rodenticides) and of relevant chemical families. Data report the quantities (in tonnes of active ingredients) of pesticides used in or sold to the agricultural sector for crops and seeds.
15. London L, Bailie R (2001) Challenges for improving surveillance for pesticide poisoning: policy implications for developing countries Int J Epidemiol. 30(3):564-70.
16. http://www.pic.int/Portals/5/download.aspx?d=UNEP-FAO-RC-SHPFs-CommuMonitoringChemConv.En.pdf
17. http://v1.vegetableipmasia.org/docs/Surveillance_manual_%28English%29.pdf
18. Murphy et al. Farmer's self-surveillance of pesticide poisoning: a 12-month pilot in Northern Vietnam. Int J Occup Environ Health. 2002;8:202-213. http://www.maneyonline.com/doi/abs/10.1179/oeh.2002.8.3.201?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed&

Section 5
Taking Action

5a - Global Action

By the mid-1980's the scale of chemical production and trade in hazardous chemicals was causing serious concern, particularly the impact on countries lacking the necessary infrastructure to monitor their import and use. In response to these concerns, UNEP and FAO developed guidelines to promote best practice and information exchange.

In 1985 FAO launched the Code of Conduct on the Distribution and Use of Pesticides. The Code of Conduct is a voluntary framework which has proved to be a valuable guide for government regulators, industry, civil society and other stakeholders on best practice in managing pesticides throughout their lifecycle. The latest version of the International Code of Conduct, published jointly with the WHO[19] in 2014, gives greater attention to health and environmental aspects of pesticides.

Public outcry following the discovery, in the 1980s, in Africa and other parts of the developing world of deposits of toxic wastes imported from abroad lead to action on waste chemicals, with The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, which came into force in 1992.

In 1987 UNEP established the London Guidelines for the Exchange of Information on Chemicals in International Trade. However, seeing the need for mandatory controls, in 1992 the Rio Earth Summit adopted Chapter 19 of Agenda 21, which called for a legally binding instrument on PIC procedures. This was achieved when the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade came into force in 2004. The Stockholm Convention on Persistent Organic Pollutants came into force in May of the same year.

In 2002 the Johannesburg World Summit on Sustainable Development agreed that, by the year 2020, chemicals be produced and used in ways that minimize significant adverse impacts on the environment and human health. The **S**trategic **A**pproach to **I**nternational **C**hemicals **M**anagement (**SAICM**) is a policy framework designed to foster the sound management of chemicals and it contributes to the 2020 goal on chemicals management.

More recently, attention has turned to identifying the most hazardous pesticides that are still in use, as a first step in the development of a risk and use reduction programme. A considerable proportion of the pesticides still being used in the world can be considered highly hazardous, because they have a high acute toxicity, have known chronic toxic effects even at very low exposure levels, or are very persistent in the environment or in organisms, for example.

FAO began developing a global approach on highly hazardous pesticides in 2006, with recommendations for governments to take policy and control actions, including potential bans on specific chemicals. In 2008 the FAO/WHO Joint Meeting on Pesticide Management (JMPM) provided a working definition for highly hazardous pesticides[20, 21]. While this development was widely welcomed, some groups felt that the definition of HHPs should include pesticides with endocrine disrupting properties, ecotoxicological properties and toxicity by inhalation. The PAN International list of HHPs[22], for example, uses a more comprehensive set of criteria.

In 2015 ICCM 4 gave special attention to pesticides. A strategy was developed to address highly hazardous pesticides through the promotion of agro-ecological alternatives. In the same year the UN General Assembly formally accepted a new set of 17 Sustainable Development Goals (SDGs). Each goal has specific targets to be achieved by 2030. The commitment to the protection of human health, livelihoods and environment is evident across all these goals and achieving more effective management of hazardous pesticides could make a very significant contribution to achieving them. Goals 2, 3, 6 and 12, in particular, include very relevant targets.

Photo: PAN-UK

THE SDGS AND PESTICIDES

Click on the goals marked with a for more information.

KEY EVENTS IN GLOBAL CHEMICALS MANAGEMENT SINCE 1985

1985
THE FIRST GLOBAL CODE OF CONDUCT
FAO launched the International Code of Conduct on the Distribution and Use of Pesticides

1987
PIC PROCEDURES
UNEP established the London Guidelines for the Exchange of Information on Chemicals in International Trade

1992
THE BASEL CONVENTION
on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

2002
2020 GOALS
Johannesburg World Summit on Sustainable Development and Human Health

2004
ROTTERDAM CONVENTION
on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade came into force

2004
STOCKHOLM CONVENTION
on Persistent Organic Pollutants enters into force

2006
SAICM
Adoption of the Dubai Declaration on International Chemicals Management and the formal establishment of the Strategic Approach to International Chemicals Management (SAICM)

2008
HHPs DEFINED
FAO/WHO Joint Meeting on Pesticide Management (JMPM) provides a working definition for highly hazardous pesticides.

2015
ICCM 4
Resolution on HHPs (SAICM/ICCM.4/CRP.16) supports concerted action to address HHPs in the context of SAICM.

2015
SDGs
UN General Assembly agrees 17 Sustainable Development Goals with targets to be achieved by 2030.

2017
UN Special Rapporteurs report to the 34th session of the UN Human Rights Council on the need for a Global, legally binding convention on pesticides.

2016
GUIDELINES ON HIGHLY HAZARDOUS PESTICIDES
published by FAO

5b – Stakeholder involvement

As highlighted in the International Code of Conduct on Pesticide Management, addressing risks and phasing out use of priority HHPs is a responsibility not only for pesticide regulators and other government agencies but also for the agrochemical industry, the food and farming sectors and beyond. Experience has shown that it is necessary to bring together a range of interests and expertise to tackle risks effectively.

Important stakeholders could include, for example:

- End users, including farmers
- Pesticide retailers and trade organisations
- Groups or networks representing high risk / vulnerable groups e.g. rural women, rural youth services, trade unions
- Ministry of Agriculture, including plant protection services, extension services, pesticides regulator
- Ministry of Health and local health services in target areas
- Ministry for Environment
- Food safety authority
- Ministries of Labour and social affairs
- Universities and research institutes
- Customs services and other relevant enforcement agencies

Effective pesticide management can also mean reaching across national boundaries. Countries sharing similar conditions often find it beneficial to share risk assessment data, for example. Cross border movement of pesticides for trade, disposal, as food residues or for reasons of environmental contamination, also drive regional and global action on pesticides.

Private sustainability standards, including Fairtrade, Rainforest Alliance and certified organic, have played a major role in helping coffee farmers not only to stop use of endosulfan but to replace it with effective IPM and agroecological alternatives. In El Salvador, progressive exporters collaborated with the coffee research institute to support large estates to rapidly phase out use from 2011 following endosulfan's Stockholm listing. In Nicaragua, development donors joined forces with farmer cooperatives and local technical experts to enable smallholders to meet Fairtrade and organic standard requirements on zero endosulfan use. In Colombia, nature conservation NGOs and the research and extension wings of the National Coffee Growers' Federation have worked together to implement pest management strategies which also reduce reliance on other hazardous insecticides.

The following links offer various experience from different parts of the world in bringing different stakeholders together to achieve effective pesticide risk reduction.

This video illustrates the process of collecting information on pesticide use and incidents of acute pesticide poisoning in Georgia, including interviews with farmers, survey enumerators, NGOs, local and national officials, the DNA and the Secretariat to the Rotterdam Convention.

Case study from Costa Rica

Experience of phasing out Highly Hazardous Pesticides and promoting alternatives in Costa Rica

Click here to read more.

Case study of endosulfan

Learning lessons from endosulfan?

Click here to read more.

5c - Using IPM and agroecological practices to reduce hazardous pesticides

FAO highlights that elimination of pesticide use that is unnecessary is the first step in pesticide risk reduction. Integrated Pest Management (IPM) and agroecological approaches helps to minimize pesticide use in general, as well as providing an effective means for farmers and government decision makers to move away from use of Highly Hazardous Pesticides.

WHAT IS INTEGRATED PEST MANAGEMENT?

Integrated Pest Management (IPM) is an approach that makes use of biological principles and ecological science, rather than the pesticide-dominant strategies which many farmers currently rely on. IPM covers not just insect pests, but also crop diseases, weeds and vertebrate pests (birds, rodents) where these cause problems. It is about managing these organisms to prevent them reaching levels where they cause economic damage, not trying to eliminate them.

The International Code of Conduct on Pesticide Management (FAO/WHO, 2014) defines IPM as:

> Integrated Pest Management (IPM) means the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimise risks to human health and the environment. IPM emphasises the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms.

We can break down this rather long definition to explain more simply the principles behind it:

Element 1) careful consideration of all available pest control techniques and subsequent integration of appropriate measures

This element is about not relying on one single method to achieve good control of pests. Too often farmers depend on chemical control, i.e. using pesticides, as their main tactic, with unwanted side effects on human health and the environment.

Farmers practicing IPM use a wider range of control techniques, leading to a more resilient approach and reduced reliance on pesticides. For key pests or diseases, one single method is rarely enough. Farmers can best manage these by combining several complementary methods.

Element 2) discourage the development of pest populations

IPM approaches start with preventing the build-up of pest populations and the spread of disease. It's always better, and often cheaper, to avoid pests, diseases or weeds reaching harmful levels in the first place, than having to take emergency action later. Farmers need to understand which conditions and farming practices tend to encourage pests and what they can do to make their fields less attractive or susceptible to problems.

Element 3) keep pesticides and other interventions to levels that are economically justified

If a particular pest, disease or weed is present in the field, this does not mean that it will cause enough yield or quality loss to lose the farmer money. Farmers often fail to think about the costs of control actions they take. Have they spent more on buying and applying an insecticide

than what they earn from the crop volume they may save from attack? This element is all about checking what pest levels are present and making decisions based on regular observations in each field and good information.

Element 4) reduce or minimise risks to human health and the environment.

An important aim of IPM approaches is to minimise harmful impacts, by replacing hazardous pesticide inputs with safer alternatives.

Element 5) IPM emphasises the growth of a healthy crop

This element forms one of the key IPM principles. Healthy and carefully tended plants are better able to cope with attacks from pests, diseases or weed competition. It's about getting seedlings off to a good start and making sure they don't get too little or too much of certain nutrients or water. Managing pests effectively is as much about good crop husbandry and careful soil and water management as it is about direct control methods.

Element 6) least possible disruption to agro-ecosystems and encourages natural pest control mechanisms

There are many naturally occurring predators, such as ladybird beetles and spiders, and parasitic insects, which play a hugely important role in keeping insect pests under some level of control. Beneficial microbes also play a part in disease and pest control while many birds, bats and frogs prey on pests too. These natural enemies of pests are essential to good IPM and should be encouraged. Unfortunately, natural enemies are often killed by pesticide applications. Reducing pesticide use will help farmers benefit from this natural biological control service for free.

Photo: PAN-UK

HOW CAN FARMERS PUT IPM INTO PRACTICE?

Effective IPM strategies combine a range of different methods or tactics:

a. Methods that prevent the build-up of damaging levels of pests, weeds or diseases

b. Methods that encourage natural pest control processes

c. Direct interventions when tactics under a) and b) fail to deliver adequate control

Preventative methods are often known as good cultural practices. They involve farmer decisions on: which crops and varieties to grow, when and where; the sequence of crops in rotation; planting time and density. Other aspects of crop husbandry are relevant too, especially good field hygiene.

> *Example in cotton*: bollworm pests can survive and reproduce in any cotton plant material left in the field after harvest. Careful removal from of cotton foliage and stalks after picking is essential to prevent bollworms surviving in high numbers into the next season.
>
> *Example in coffee*: in several countries, modern coffee cultivars have been bred which can tolerate coffee leaf rust disease. By replacing old bushes with disease-resistant varieties, growers can reduce fungicide use and improve yields.
>
> *Example in wheat*: creating a 'stale' seed bed is a good tactic to reduce weed competition early in the season. By harrowing the field lightly before sowing, weed seeds are encouraged to germinate and can then be removed by a further harrow pass, reducing the need for herbicide spraying.

Encouraging natural control: this involves providing suitable habitat with food resources and shelter for natural enemies, in and around fields. In some crops, more direct ways of manipulating key natural enemies can enhance their pest control contribution.

> *Example in citrus and mango orchards*: Weaver ant species are very effective predators of insect pests. Using ropes to connect trees allows forager ants to travel more quickly across the orchard canopy to look for prey. Ant nests can also be introduced into the orchard.
>
> *Example in arable field crops*: Sowing field border rows of flowering plants attracts hoverflies and parasitic wasps to feed on the nectar. Their larval stages prey on aphids and other cereal pests.

Weaver ants attacking primitive ant. Photo: Axel Rouvin, creativecommons.org/licenses/by/2.0/.

Case study: Increasing biological pest control in cotton

First developed in Australia to reduce hazardous insecticide use in large-scale cotton, the 'food spray method' has been taken up by several thousand smallholders in Benin and Ethiopia. Food sprays are made from fermented maize or waste brewers' yeast, and attract predatory insects by mimicking the chemical cues they use to locate prey. Sprayed onto the cotton foliage early in the season, the first food spray attracts these predators into the field so they are ready and waiting before the first bollworms and other major pests arrive. Farmers then need to monitor their cotton fields at least once a week to check if they have a favourable level of predators present. Further food sprays can be applied as needed, when pests start to outnumber natural enemies.

The method also involves sowing 1-3 rows of sorghum or maize between every 8-10 rows of cotton. Bollworm female moths prefer to lay eggs on these plants at flowering stage than on cotton, so they serve as a 'trap crop' to lure this pest away from the cotton. The foliage also provide a refuge for natural enemies. For the food spray method to work well, broad-spectrum insecticides which can kill the predators must be avoided.

Combining the food spray method with good cultural practices for cotton and other methods, has enabled these farmers to stop using endosulfan and other HHPs in organic and IPM systems. Along with other practices introduced via Farmer Field School training, farmer groups have succeeded in increasing yields and income from their cotton and no longer risk exposure to harmful pesticides.

An organic cotton grower in Shelle Melle, Ethiopia. Photo: PAN-UK

References: **Benin: productive and profitable organic cotton**. S Williamson & DS Vodouhê, Chapter 7.1 in **Replacing Chemicals with Biology: Phasing out highly hazardous pesticides with agroecology**. *Pesticide Action Network International, 2015*. Via: http://pan-international.org/resources/

Using the Food Spray Method to enhance biological control in cotton: a trainers' guide. *PAN UK, 2016.* Via: http://www.pan-uk.org/news/pan-uk-launches-new-food-spray-manual

Direct interventions: some form of additional control will often be needed, for a particular pest, disease or weed presence in a specific field or season. A range of physical, biological, botanical and chemical methods can be used, with a preference for non-chemical ones where possible, in order to minimise harm to people and to conserve beneficial organisms. These direct controls should not be routine, but based on field observations of pest levels or on technical guidance (e.g. crop disease forecasts for the local area).

Example in apple orchards: Sex pheromone traps are used by many growers for reducing populations of codling moth pest. The traps release a synthetic version of the chemical signal emitted by the female moth to attract males. When placed at appropriate time and density among the trees, the traps can disrupt mating and reduce reproduction. These traps also help as a monitoring tool for more accurate timing of chemical control.

Example in potato: Non-flying Colorado beetle pests can be prevented from re-entering fields in the early season by digging shallow but steep-edged trenches along the borders. Ready-made, plastic-lined trench strips are now available. In smallholder systems, hand picking of the easily visible beetle egg masses can be cheaper and easier than spraying insecticide.

"Getting good control of this pest [coffee berry borer] is all about well trained staff, continuous monitoring, good picking practices, field hygiene, and applying biological products. Our groves are very low in incidence now and we've been reducing insecticide use every year"

Mrs Marlen Sánchez, farm management team, La Lila estate (55ha), Colombia

Case study: Managing Coffee Berry Borer without endosulfan

Interviews with large and small scale coffee farmers in 3 Latin American countries showed that it has been perfectly feasible, technically and economically, to control this beetle pest when they combine two or more IPM methods. The foundation of effective, ecologically-based strategies is good field hygiene to reduce borer breeding sites- removing early ripening bored berries, and then a very thorough clean-up of any dried berries left on bushes and on the ground after harvest.

For direct interventions, in Central America, many growers are now deploying traps containing a tiny dispenser of methanol / ethanol, which attract the female borers as they emerge early in the season. Large numbers can be caught, helping to keep borer levels lower as the berries mature. In Colombia, even large estates have achieved good results with biopesticide application, based on the fungus *Beauveria bassiana*, along with good practices in harvesting and processing operations, to avoid beetles surviving to re-invade coffee plots.

Almost half of farms studied have been able to greatly reduce or eliminate all use of insecticides for Coffee Berry Borer, demonstrating that alternatives to HHPs need not mean simply reaching for another chemical, which may pose other hazards. These farmer experiences also dispel the misconception that IPM alternatives are always more expensive. Trapping is cheaper than endosulfan use, while biopesticides are similar in price to insecticides. Careful field sanitation is labour intensive; however, farmers report that the extra costs are compensated by reduced borer damage and they may earn a higher price for cleaner beans.

References: **Phasing out Highly Hazardous Pesticides is possible! Farmer experiences in growing coffee without endosulfan**. **Leaflet for policy makers**, *PAN UK & FAO, 2015.* http://www.pan-uk.org/files/Endosulfan_leaflet_ENGLISH.pdf Also available in French, Spanish, Portuguese, Russian, Mandarin and Arabic.

See the set of 4 IPM videos on farmer experiences in managing Coffee Berry Borer using cultural controls, biopesticides and trapping and monitoring, farm case studies and guidance materials via: http://www.pan-uk.org/coffee-without-endosulfan/ . Videos also available in French, Spanish, Portuguese.

Colombia: Agroecological coffee production. S Williamson, JG Londoño & G Rivero. Chapter 8.2 in **Replacing Chemicals with Biology: Phasing out highly hazardous pesticides with agroecology**. by Meriel Watts with Stephanie Williamson. *Pesticide Action Network International, 2015.* Via: http://pan-international.org/resources/

BEYOND IPM TO AGROECOLOGICAL PRODUCTION

Farming systems which are highly reliant on synthetic pesticides and fertilisers and fossil fuels are unsustainable, biologically and economically, in the medium term. The FAO, international policy makers and many other stakeholders are calling for a shift to ecological intensified farming, based on agroecological science. Agroecological farming methods aim to maximise beneficial biological interactions and use of local, natural resources, with an emphasis on building healthy soils and diverse cropping systems that are more resilient to pest attack, adverse weather and to climate change. Successful agroecological initiatives pay equal attention to food provision, group marketing, gender and social welfare aspects as to agronomic practices. Considerable evidence now exists that agroecological approaches can help smallholder families improve their income and whole farm productivity, as recognised by the World Bank in its assessment of the Community Managed Sustainable Agriculture (CMSA) programme in India. Over 10 million CMSA farmers have replaced agrochemical inputs with agro-ecological methods for pest and soil management in rice, cereals, beans and vegetables, while maintaining yields and increasing profits.

ECONOMIC AND OTHER BENEFITS OF USING IPM AND AGROECOLOGY

Replacing HHPs with IPM and agroecological methods delivers many economic, social and environmental benefits for farm families and workers, the agricultural sector and for governments and the public:

- ✓ Reduced exposure to hazardous pesticides for those working on farms and living close by
- ✓ Reduced poisoning of livestock, fish, pollinators and wildlife
- ✓ Reduced pesticide contamination of water courses and soil
- ✓ Reduced risk of pests, diseases or weeds developing resistance to widely used pesticides
- ✓ Reduced risk of major or secondary pests outbreaks when pesticides kill off the more sensitive natural enemies
- ✓ Safer food for consumers, with less pesticide residue
- ✓ Opportunities to supply more rewarding markets which demand produce grown with reduced or zero pesticides
- ✓ Lower expenditure by farmers and health services on treating pesticide-related illness

The 'hidden' costs from the negative side-effects of current reliance on pesticides run to billions of US dollars. It therefore makes good economic sense for governments and the food and farming sectors to invest in IPM as a more sustainable alternative.

SUPPORTING FARMERS TO REDUCE RELIANCE ON PESTICIDES

Checking for pests on greenhouse tomatoes. Photo: PAN-UK.

IPM is more knowledge-intensive than practices which rely mainly on pesticides. Farmer training is essential for farmers to learn the skills required and gain the confidence to reduce pesticide use and replace with IPM techniques. Farmer Field School (FFS) training methodologies have worked extremely well to deliver this change. They are based on 'discovery-learning' methods, in which farmer groups are supported to learn about pests and natural enemies and IPM methods over a full cropping season. Trained facilitators help the group set up and assess field plots to compare their current practice with IPM methods, learning how to monitor the health of the crop and take better informed decisions on crop management.

FFS programmes have reached millions of farmers in a range of crops in developing countries. Trainers' guides for agroecological pest management and other resources are available for major crops. Most FFS programmes also build capacity of farmer groups to improve marketing of their produce and to address welfare and development issues in their communities, often giving a more prominent role for women and youth. The regional FAO West Africa Integrated Production and Pest Management programme in rice, cotton and vegetables is a good example of how FFS training and farmer group strengthening, with local government involvement, was able to cut use of hazardous pesticides by over 90%, saving farmers' money and reducing health and environmental problems. The principles they used were described as follows:

- A sound and judicious use of pesticides
- The acquisition of knowledge and practical skills critical to pest control
- The reinforcement of decision-making capacity of growers at field level
- The development of a better low-cost productivity which protects the environment

For more information see:

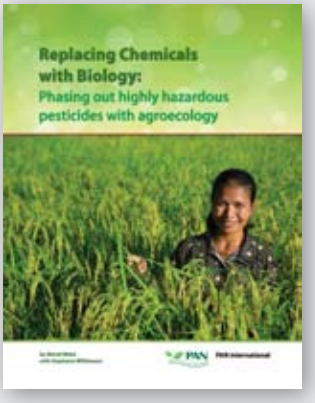
West Africa Integrated Production and Pest Management programme. FAO, 2011. Via: http://www.fao.org/agriculture/ippm/ippm-home/en/

FAO Asian Regional IPM/Pesticide Risk Reduction Programme. Via: http://www.vegetableipmasia.org/index

A child in Benin relaxing on some of his village's organic cotton harvest. Photo: PAN-UK.

For more information on phasing out HHPs in India see:

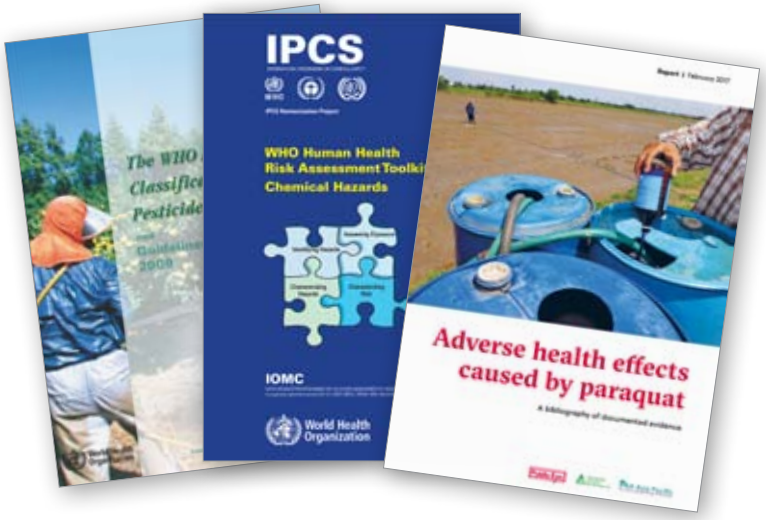
India CMSA case study Chapter 6.1 and others in **Replacing Chemicals with Biology: Phasing out highly hazardous pesticides with agroecology** by Meriel Watts with Stephanie Williamson *Pesticide Action Network International, 2015*. Via: http://library.ipamglobal.org/jspui/bitstream/ipamlibrary/463/1/Phasing-Out-HHPs-with-Agroecology.pdf/



Section 5 Endnotes

19. http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf
20. http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/hhp/en/
21. FAO/WHO Guidelines on Highly Hazardous Pesticides (2016)
22. http://www.pan-germany.org/download/PAN_HHP_List_161212_F.pdf
23. UNEP (2013) Report on the Costs of Inaction on the Sound Management of Chemicals

Section 6
Reference Material

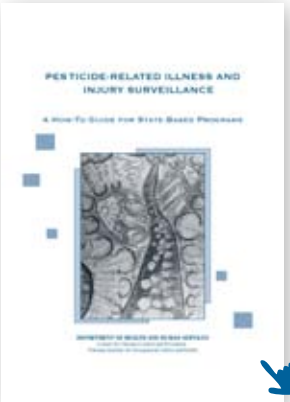


Reference materials are divded into the following topics:

Developing health monitoring systems; manuals and guides

Guidelines on Developing a Reporting System for Health and Environmental Incidents Resulting from Exposure to Pesticides

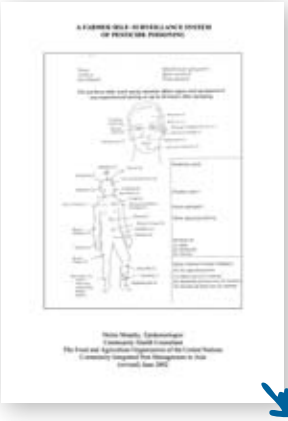
(FAO, WHO, 2009) Guidelines produced under the International Code of Conduct on the Distribution and Use of Pesticides. The purpose of this guideline is to assist governments in taking the first step in the development and establishment of a basic reporting program for pesticide incidents, which have been defined here as situations where pesticide exposure has resulted in a health or environmental problem. The information collected can be used to minimize adverse impacts on human health and the environment through appropriate pesticide risk reduction measures. Information on incidents should be provided to pesticide regulatory authorities as a means of strengthening national decision making on pesticides.



Pesticide-Related Illness and Injury Surveillance: A How-To Guide For State-Based Programs

(NIOSH Publication No. 2006-102) This comprehensive manual provides information on how to develop and maintain surveillance programs for acute and sub-acute health effects from pesticide exposure. It was developed for U.S. State health departments with planned or established pesticide poisoning surveillance programs. NIOSH is the U.S. federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness.

Case studies and field tools



A farmer self-surveillance system of pesticide poisoning

(Helen Murphy, Community Integrated Pest Management in Asia, FAO June 2002) A tool developed by the Integrated Pest Management Programme for Asia (FAO/IPM) to prepare simple means for farmers to self-report signs and symptoms of pesticide poisoning after each spray session. Trained community members collect the forms weekly. They then summarize, graph, and present back to the participating community the data for discussion on a monthly basis. A local physician attends each of these meetings and adds any pesticide poisoning cases seen in the local clinic from the proceeding the month.

Pilot study on agricultural pesticide poisoning in Burkina Faso

(Toe Adama, Final report, FAO, 2010) A pilot study sponsored by the Secretariat of the Rotterdam Convention. The report provides details of the methodology used, including copies of survey tools, as well as an analysis of the results of surveys conducted among various stakeholders including farmers, health officers and retailers.

Pesticide Exposure Record and instructions

(WHO, 2001) Pesticides Exposure Record (PER) – a standard format for collecting data on human exposures to pesticides, developed by WHO.

Pesticide incident report forms

(Secretariat of the Rotterdam Convention, 2004) Standard incident report forms for human health incidents and environmental incidents involving hazardous pesticide formulations have been developed to assist with the reporting of these incidents.

A survey tool in Kiswahili

(Helen Murphy, Progress report, FAO March 2010) This is a survey tool based on self-surveillance system, controlling pesticide accumulation at community level in Lake Eyasi Basin, Keratu District, Tanzania.

A season-long assessment of acute pesticide poisoning among farmers in three villages in India

(Int. J. Occup. Environ Health, 2005 July-Sept:11(3):221-32. Acute pesticide poisoning among female and male cotton growers in India. Mancini, F., Van Bruggen, A.H., Jiggins, J.L., Ambatipudi, A.C., Murphy, H.) A season-long assessment of acute pesticide poisoning among farmers was conducted in three villages in India.

The study documented the serious consequences of pesticide use for the health of farmers, particularly women field helpers.

Results template for SHPF pilot projects under the Rotterdam Convention

(Secretariat of the Rotterdam Convention, 2010) This results template is designed to capture important lessons learned from health surveillance projects. Its purpose is to generate a body of information from different projects that can be used to encourage and facilitate other countries to initiate their own surveillance programmes in relation to pesticide use. It requests summary information in a standardised format for easy comparison.

Risk assessment

The International Code of Conduct on Pesticide Management

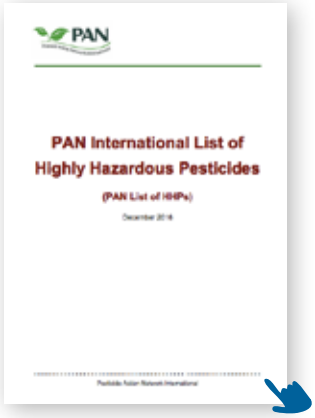
www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf

FAO/WHO (2016) Guidelines on Highly Hazardous Pesticides

www.fao.org/3/a-i5566e.pdf

FAO Pesticides Registration Toolkit

www.fao.org/pesticide-registration-toolkit/tool/home/

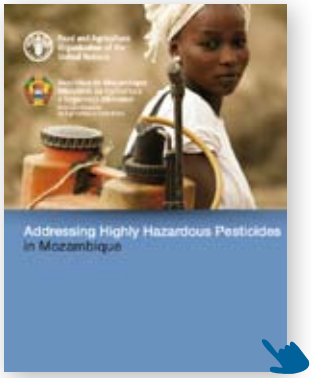


PAN International list of Highly Hazardous Pestcides

pan-international.org/wp-content/uploads/PAN_HHP_List.pdf

PAN International Consolidated list of Banned Pesticides

pan-international.org/pan-international-consolidated-list-of-banned-pesticides/



Addressing Highly Hazardous Pesticides in Mozambique

www.fao.org/3/a-i5360e.pdf

WHO Recommended Classification of Pesticides by Hazard

(WHO, 2009) This document sets out a classification system to distinguish between the more and the less hazardous forms of selected pesticides based on acute risk to human health. It takes into consideration the toxicity of the technical active substance and also describes methods for the classification of formulations. The WHO Hazard Classes are aligned with the GHS Acute Toxicity Hazard Categories for acute oral or dermal toxicity.

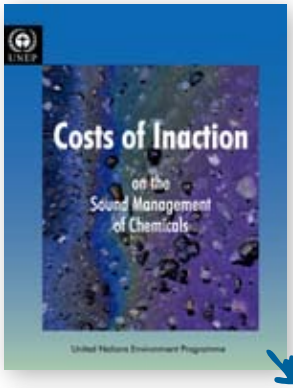
Health Risk Assessment Toolkit: Chemical Hazards

(WHO, 2010) The Toolkit provides users with guidance to acquire and use the information needed to assess chemical hazards, exposures and the corresponding health risks. It contains road maps for conducting a human health risk assessment, identifies information that must be gathered to complete an assessment and lists electronic links to international resources from which the user can obtain the necessary information and methodologies. The Toolkit is applicable to pesticides and includes a pesticide case study.

Adverse Health Effects Caused by Paraquat

Poisoning and adverse health effects caused by paraquat among agricultural workers and the public – A bibliography of documented evidence (2017) Public Eye, Pesticide Action Network UK and PAN Asia Pacific . Ed. Richard Isenring

Advocating for action on pesticide poisoning



Costs of Inaction on the Sound Management of Chemicals

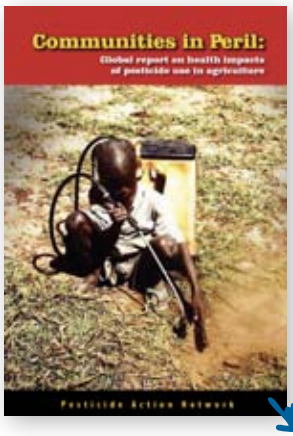
UNEP (2013) Report on the Costs of Inaction on the Sound Management of Chemicals

What is pesticide poisoning?

(Secretariat of the Rotterdam Convention, 2010) This short leaflet identifies the reasons for monitoring health impacts of pesticides and briefly outlines steps towards developing a monitoring programme.

Childhood Pesticide Poisoning: Information for Advocacy and Action

(FAO/UNEP/WHO, 2004) Pesticide poisoning is a serious health problem that disproportionately affects infants and children. The purpose of this document is to provide you with information for advocacy and action directed at reducing pesticide poisoning and addressing its effects on children and women.



Communities in Peril–Global report on health impacts of pesticide use in agriculture

(Pesticide Action Network, 2010) The report presents and analyses the results of 21 surveys in 13 countries in Asia, Africa and South America. A sample survey tool is included.

Community based Monitoring and Chemicals Conventions

(Pesticide Action Network, 2010) Evidence of pesticide impacts can help governments to improve national pesticide regulation and help shape international instruments and policies for pesticide control.

Community monitoring is a locally-based process of documenting the effects of pesticides. Through the process of documenting pesticide exposure and impacts, communities become more aware of the risks, a first step toward adopting more ecological and sustainable agricultural practices and reducing their dependence on pesticides.

Promoting safer use of pesticides

International Chemical Safety Cards

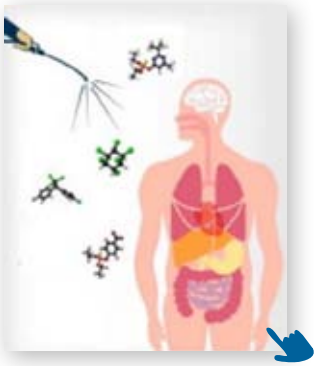
(World Health Organization and International Labour Organization) International Chemical Safety Cards (ICSCs) provide essential health and safety information on chemicals to promote their safe use. They are used at the "shop floor" level by workers and employers in a range of settings including in agriculture.

(www.inchem.org)

Posters: Clinical effects of pesticides and disposing of used pesticide containers

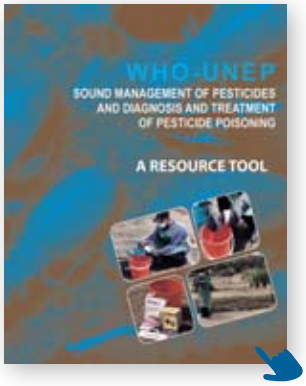
(Pesticide Action Network in Africa) A posters designed to raise awareness on the effects of pesticides and on the hazards posed by empty pesticide containers.

Treatment of pesticide poisoning



Exposure to pesticides and the associated human health effects

Sci Total Environ. 2017 Jan 1;575:525-535. doi: 10.1016/j.scitotenv.2016.09.009. Epub 2016 Sep 7.



Sound management of pesticides and diagnosis and treatment of pesticide poisoning

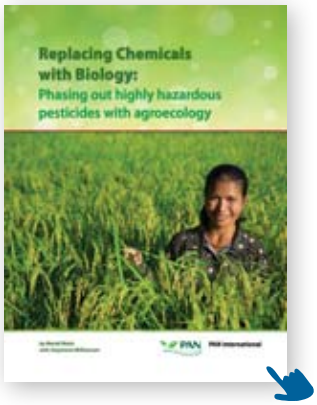
(WHO/UNEP) A WHO/UNEP resource tool intended to assist those involved in the management of pesticides and with diagnosis and treatment of pesticide poisoning in formulated training courses, adapted to the needs of specific target groups.

Unlike the other resources listed above, WikiTox is not provided in this toolkit. However it is available free online, providing a resource for teaching materials on toxicology, funded by the South Asian Clinical Toxicology Research Collaboration (SACTRC).

Safer alternatives

West Africa Integrated Production and Pest Management programme.

FAO, 2011



Replacing Chemicals with Biology: Phasing out highly hazardous pesticides with agroecology.

Pesticide Action Network International, 2015.

Phasing out Highly Hazardous Pesticides is possible! Farmer experiences in growing coffee without endosulfan.

Leaflet for policy makers, PAN UK & FAO, 2015. http://www.pan-uk.org/files/Endosulfan_leaflet_ENGLISH.pdf Also available in French, Spanish, Portuguese, Russian, Mandarin and Arabic.

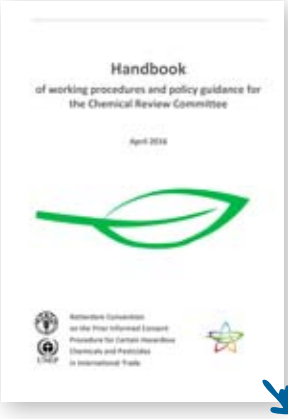
The Rotterdam Convention

Additional resources on other aspects of the Rotterdam Convention are available from www.pic.int.

Guidance to Designated National Authorities on the Operation of the Rotterdam Convention

This document has been developed to provide comprehensive guidance to Designated National Authorities (DNAs) on the rights and obligations of Parties under the Convention.

It is also a comprehensive source of information for a wide audience on the Convention and its operational elements



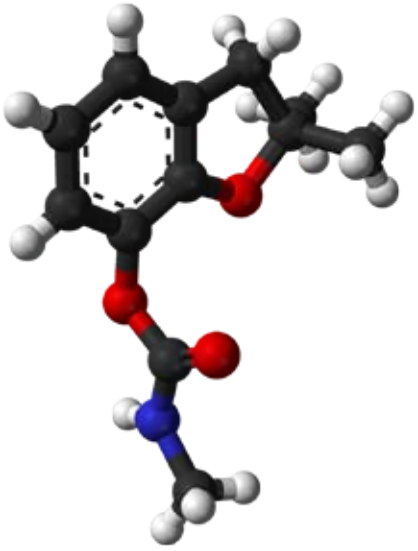
Handbook of working procedures and policy guidance for the Chemical Review Committee.

http://www.pic.int/TheConvention/ChemicalReviewCommittee/Guidance/tabid/1060/language/en-US/Default.aspx

Case studies

1. Colombia's proposal to list specific formulations of carbofuran in Annex III – A Case Study
2. Learning lessons from endosulfan? – A case study
3. Case study in Burkina Faso – implementing an SHPF programme
4. Case study in Eastern Europe, Caucasus and Central Asia (EECCA. Gathering information about risky practices and self-reported signs and symptoms of acute pesticide poisoning.
5. An interview on community health monitoring and pesticides with Dr Francisca Katagira, Principal Agricultural Officer in the Ministry of Agriculture Food Security and Cooperatives, and Designated National Authority for the Rotterdam Convention, Dar es Salaam, 26 February 2008.
6. Experience of phasing out Highly Hazardous Pesticides and alternatives in Costa Rica

Colombia's Proposal To List In Annex III Specific Formulations Of Carbofuran - A Case Study



Ball-and-stick model of the carbofuran molecule

Prior to the Chemical Review Committee meeting in Rome, September 2016, Colombia submitted a proposal to list all liquid formulations of carbofuran at concentrations 330g/L or above in Annex III in line with paragraph 1 of Article 6 of the Convention.

The assessment of pesticide formulations containing carbofuran compared incidents during the years 2011 to 2013. For 2011 alone, 699 cases of acute pesticide poisoning by occupational exposure were reported to the public health system, El Sistema de Salud Pública (SIVIGILA). The incidents occured by inhalation and dermal exposure, and the active ingredients included: carbofuran (408 cases), glyphosate (69) and methomyl (36).

Further investigation of carbofuran incidents indicated that 95% of people were poisoned with liquid formulations containing carbofuran concentrations at or above 330g/L.

In January 2016, PAN-UK interviewed key officials in Colombia to better understand how they completed the information on carbofuran and to understand any difficulties they faced. Participants included several representatives of the Ministry of Health, including the Designated National Authorities, as well as FAO Colombia.

1. How many incident reports have been submitted by Colombia under Article VI?

One; the notification of health incidents caused by liquid formulations of pesticides with active ingredient carbofuran in concentrations of 330g/L or higher

2. Please describe the incidents and explain why they were considered to be significant.

Incident description: The notification focused on the 100 persons who were poisoned by liquid formulations of pesticides containing at least 330g/L carbofuran.

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3. The product

Our own (Colombian) monitoring system reported that 11% of people identified Furadan 3SC as the name of the pesticide linked to incidents, while 70% link them with 'Furadan'. This variation shows the lack of knowledge of the exact name of the formulation used. A further complication was the addition of mixtures of pesticides. 24% reported mixing different products, including other cholinesterase inhibitors which could exacerbate the signs and symptoms.

46% of incidents occurred after the person mixed pesticides in the sprayer, and 92% people affected applied pesticides in the fields or orchard (some respondents undertook both tasks). The main crops referenced were banana (20 cases) and coffee (115 cases). The application methods used were: backpacks prayer 65% and stationary pump 16%.

4. Symptoms and treatment

Most symptoms were identified within an hour of exposure. The routes of exposure mainly involved were dermal (60%), inhalation (12%) and oral (25%)[1].

76% resorted to home remedies before going to the hospital, including drinking water and honey (24 people), take a bath (21 people) and drinking a glass of milk (20 people). Among these actions, only the bath is recommended, since it helps to remove the pesticide residues from the body while the other two can help the absorption of the substance favouring the intoxication.

5. PPE

Only 25% reported use of PPE. In many cases the equipment was not suitable. Of the 25% people saying they use PPE, 42% used dust masks, for example, compared to 15% using a respirator. Other poor practices were identified e.g. just 13% indicated that they wore their trousers outside their boots (this is recommended to reduce contact with the pesticide in case of spillage on clothing.

When asking why they don't use PPE, the most frequent answers were: 41% I'm not used to it / no one uses it; 30% the employer did not provide them; 5% the weather does not allow to use them (very hot); 5% said they were unaffordable; and 5% said they did not need them.

6. Label

93% (43 people) of the people who carried out the mixing and tank filling said that the pesticide had the label, but only 12 people read it. This indicates poor observance of correct use and safety procedures.

7. Why were incidents relating to carbofuran deemed to be important?

Pesticide formulations with active ingredient carbofuran were found to be associated with the majority of cases of occupational poisonings under common conditions of use for the years 2011, 2012 and 2013. For 2011, 699 cases of acute pesticide poisoning were reported to Sivigila related to occupational exposure. The active ingredients involved were carbofuran (408 cases), glyphosate (69) and methomyl (36).

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8. How were you made aware of the incidents?

The incidents were detected by the national public health surveillance system, called 'Sivigila'. Sivigila is formed by the Public Health Surveillance Network, composed of relevant individuals, organisations and institutions whose activities influence the health of the population. Sivigila was created to monitor events that may affect public health in a systematic and timely manner, in order to Guide policies and planning in public health:

- Make decisions for the prevention and control of diseases and risk factors in health
- Optimize the monitoring and evaluation of interventions
- Rationalize and optimize available resources and achieve the effectiveness of actions in this area, aiming at the protection of individual and collective health. Through the Sivigila system data are collected continuously from a large number of trained operators. The information is collated weekly and the data of epidemiological interest is published monthly. The system allows collection of information regarding a wide variety of incidents (deliberate and accidental) and the route of exposure. The contact details of people reporting health incidents are collected, allowing for follow up if needed. Rural doctors are trained to report incidents, but they rely on a toxicological service for more specialist advice and support.
- What is the value of collecting data on pesticide incidents?

This information enables us to document the main risk factors associated with intoxication and thus to identify the interventions required.

9. Which organisations / institutions were involved in the process of collecting and reviewing the data?

Ministry of Health and of Social Protection- MSPS, National Designated Authority for the Rotterdam Convention
The Instituto Colombiano Agropecuario-ICA, National Designated Authority for the Rotterdam Convention
The Food and Agriculture Organization of the United Nations (FAO)
The National Consulting Center, polling company
The National Health Institute

Additionally, we had the support and information of:
Chancellery
National Environmental Licensing Agency
Ministry of Environment and Sustainable Development

10. Doyou think similar incidents will happen again?

Yes, Sivigila is still revealing incidents caused by carbofuran and other pesticides.

11. Are some parts of the country more or less likely to report pesticide incidents? Why?

Agricultural departments have a greater potential to collect information and to monitor pesticides poisoning.

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12. What motivated you to submit SHPF incident forms?

The form was presented taking into account that these formulations were the ones that generated the greatest number of notifications of occupational pesticide poisoning, which allows us to identify that this pesticide generates a greater risk of intoxication.

13. Did you have any support / encouragement to make the SHPF notification?

Yes, through the FAO the Secretariat of the Rotterdam Convention gave us financial and technical support.

14. Did you find anything particularly challenging / difficult about the process?

We needed more information about the CRC review process and the evaluation criteria and also the completing of the form. Since it is supposed to be used with farmers it would be useful to adapt the questions and express them in an easier way. The form is not easy to use for data analysis, another format could be more manageable.

15. What do you wish you had known before you started the process?

I believe that by having the Sivigila we had all the necessary information before starting to collect additional information.

16. Overall, was the process easier or harder than you expected? Please explain

The difficulty was that some people moved or changed telephone number and so we could not contact them. However, it was easier than we expected because almost all the people we contacted agreed to give us the information.

17. What feedback did you receive afterwards?

We received comments from industry asking insistently about the kind of exposure that led to the intoxication of the people evaluated; it was explained that the intoxication was due to occupational exposure.

18. Are you planning to report any more incidents to the Rotterdam Convention?

Yes, we have been evaluating the possibility of doing a report routinely: however to do that we need technical and operative capacity in the Departmental Health Secretaries. We are evaluating how to implement it.

19. Can you foresee any obstacles to any future submissions under Article VI?

Yes, the [pesticides] regularly tells us that notification is an obstacle to their trade.

20. Would you do anything differently next time?

Yes, I would use the health incident form as soon as possible with the person who experienced pesticide intoxication, in order to avoid memory bias and the modification of contact details.

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21. What advice would you give to other DNAs thinking of undertaking the process?

Each country has different characteristics, but if they have a Public Health Surveillance System, the idea is that this notification process would be articulated within the System and that the data reported in the surveillance system would be used. This greatly facilitates the work.

If a public health surveillance system is not in place, it should be developed to allow collecting notifications later on, otherwise more technical, economic and operational resources will be required to consolidate the notification of health incidents.

22. How should other DNAs start?

The first step should be to start analysing the epidemiological behaviour of pesticide poisonings occurring in the country and in this way define the pesticide to be evaluated and where the information would be collected.

23. What would you change about the process if you could?

I would not make any changes to the process.

Endnote

1. The question allowed multiple answers from respondents

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Case study in Burkina Faso

A training workshop was organised in May 2010 for the data collection campaign that was to follow in June and July – the months when pesticide use is highest. The campaign was conducted in three regions: Cascades, Hauts Bassins and la Boucle du Mouhoun. A final workshop was held to evaluate the results, raise awareness regarding the benefits of Article 6 for developing countries, strengthen the capacities of various relevant bodies on pesticide poisoning data collection and assist the DNA to make a SHPF proposal to the Secretariat.

METHODOLOGY

The study was carried out using retrospective and prospective surveys conducted among different stakeholders including farmers, pesticide distributors / retailers and health officials using structured and semi-structured interviews. Interview factsheets were formulated on the basis of the forms prepared by the RC. Before finalising the questionnaires they were tested on a few retailers and farmers and any questions that did not come across clearly were revised. Training was held to help build surveying techniques and knowledge of various tools amongst the interviewers. Retrospective surveys were used with farmers to document cases of intoxication and related details. Prospective questions were used to document knowledge and attitudes towards agricultural practices involving pesticides.

Sampling of farmers was decided on the basis of the size of their landholding; they were divided into four groups according to farm size and each group was equally represented. All pesticide retailers / distributors in small villages were included. In the bigger towns, retailers were included on the basis of their geographical location. All health centres in the area were included. The active ingredients in the pesticide formulations and their concentration were identified. The researchers went on to research the chemical family, the hazard class under World Health Organisation's classification and relevant regulations to strengthen their case. A report, collating all the information and analysis, was forwarded to the DNA who filled out Part A of the SHPF form and submitted it to the Secretariat.

FINDINGS

650 farmers were surveyed and 296 poisoning cases from pesticide application were recorded. Pesticide formulations containing paraquat (Gramoxone Super, Calloxone, Gramoquat super, Benaxone) were found to cause 59 incidents. From 42 health care centres 922 poisoning cases were recorded, but only in 22 cases was it possible to identify the pesticide formulation implicated and the circumstances of the exposure, out of which 2 were related to Gramoxone Super. It was also found that farmers did not follow good agricultural practice regarding personal protective equipment (PPE); only 0.31% of those interviewed wore the recommended PPE whilst spraying.

Important contributing factors identified were: 60.5% of the population interviewed had had no education at all and poor literacy meant they were unable to read the labels, and the

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inappropriateness of the PPE to hot climate. Only 37% of the distributors interviewed had warehouses to store the pesticides and of them only 30% had trained warehouse keepers. In some rural towns it was found that the retailers stored the pesticides in their bedrooms.

The study discovered that none of the farmers received any healthcare related to pesticide exposure. The healthcare officials had no information on pesticides and any healthcare the farmers received was at their own expense. Paraquat has no specific antidote and the lack of training for the healthcare officials led to inappropriate treatment of intoxication.

Note: the Sahelian Pesticide Committee decided to ban Paraquat in 2006 and it should not have been in use at all whilst this study was carried out in 2010.

WHAT HAPPENED NEXT

Burkina Faso sent a completed and submitted an SHPF incident report to the Secretariat, proposing the listing of Gramoxone® Super in Annex III of the Rotterdam Convention. The documentation met the criteria listed in Annex IV of the Convention, and it was published in PIC Circular XXXII (12, Dec. 2010).

The proposal and supporting documentation were made available to the Chemical Review Committee for its consideration in 2011. The Committee considered that the evidence submitted provided sufficient evidence that the use of Gramoxone® Super, under conditions of use in Burkina Faso, resulted in the reported incidents. Further, the Committee determined that there was sufficient evidence that the incidents reported by Burkina Faso were relevant to other States with similar climate, conditions and patterns of use of the formulation.

Finally, the Committee concluded at its seventh session that the proposal from Burkina Faso to list Gramoxone® Super (paraquat dichloride formulated as emulsifiable concentrate of 276 g active ingredient/L, corresponding to paraquat ion at 200 g/L) in Annex III to the Convention as a severely hazardous pesticide formulation met the documentation requirements of part 1 of Annex IV and all criteria set out in part 3 of Annex IV to the Convention.

The sixth meeting of the Conference of the Parties in 2013 considered the listing of liquid formulations (emulsifiable concentrate and soluble concentrate) containing paraquat dichloride at or above 276 g/L, corresponding to paraquat ion at or above 200 g/L in Annex III of the Rotterdam Convention. A draft Decision Guidance Document was published[1] and, whilst there was agreement that the criteria had been met, it will continue to be considered at future COPs.

For further details: http://www.pic.int/TheConvention/Chemicals/Recommendedforlisting/Paraquatdichloride/tabid/2396/language/en-US/Default.aspx

Endnote

1. http://www.pic.int/Portals/5/download.aspx?d=UNEP-FAO-RC-DGD-Paraquat_SHPF.En.pdf

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Case study in Eastern Europe, Caucasus and Central Asia (EECCA)

The project was conducted in 2014/2015 in six countries in EECCA and gathered information about risky practices and self-reported signs and symptoms of acute pesticide poisoning. The participating countries were Armenia, Belarus, Georgia, Kyrgyzstan, Moldova and Ukraine and the work was supported by the European Union and implemented by the Food and Agriculture Organization of the United Nations in collaboration with the Secretariat of the Rotterdam Convention and PAN-UK.

Data collection in Kyrgyzstan. Photo: PAN-UK

National non-governmental organisations were trained and supported to undertake studies in the six countries using desk studies, group discussions, structured and semi-structured interviews, and participatory mapping exercises. Discussions and interviews were used to explore the issues in more depth and to verify the results of the surveys. A national workshop in each country fed the results back to key stakeholders at all levels and a variety of communications materials were produced in national languages to raise awareness of the issues that emerged.

200 people living / working on farms that use pesticides within the target area were surveyed in each country. The survey tools were developed by PAN-UK in collaboration with the Secretariat of the Rotterdam Convention. Target areas for the surveys were selected in consultation with Ministries of Agriculture on the basis of relatively high pesticide use and high incidence of the target group.

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All survey respondents lived or worked on farms that use pesticides in the target area. Four questionnaires were used:

1. Adults who handle pesticides directly e.g. mixing or applying them
2. Adults who don't handle pesticides directly
3. Children (under 18 years)
4. Third party incidents (a short set of questions offered the opportunity for adult respondents to report incidents that happened to someone else)

The survey for children is short, uses simple language and pictures.

FINDINGS

The goal of this study was to identify common exposure scenarios and self-reported incidents of pesticide poisoning for each member of the farming household and seasonal workers.

The study strongly suggests that smallholder farmers across the region are routinely using pesticides without the information or equipment they need to reduce the risks to themselves and their communities. 79% of respondents said they wear ordinary clothes when they spray pesticides, for example, and just 7% participants had received safety training in relation to handling pesticides in the previous five years.

Many respondents buy pesticides in unlicenced premises (e.g. 69% of respondents in Ukraine). The practice of repacking pesticides into drinks bottles and plastic bags seemed to be very common. Just 23% of respondents in Armenia, for example, said they bought their pesticides in their original containers. Selling pesticides in improvised containers is more likely to lead to spills, leaks and accidental exposure. It also means that there is no label to refer to for information regarding safety, handling, dose, harvest interval, etc. The disposal of empty pesticides containers was also problematic. In Kyrgyzstan and Moldova the most common option was to burn empty containers or to discard them in the field.

It is often assumed that men are at greatest risk because they often take on the task of spraying pesticides. The studies of farming families showed that, while men are indeed often at high risk, many women and children are also taking on this hazardous work.

ACTION BY NATIONAL AUTHORITIES

All six national partner organisations (NGOs) engaged positively with the national authorities. In Kyrgyzstan, for example, MPs visited affected rural communities and the national partner, BIOM, was invited to speak on survey findings, particularly in relation to children's exposure to pesticides, in the national parliament. In Georgia, the regulatory authorities responded by tightening enforcement of regulations on repacking and labelling of pesticides and also reported a serious poisoning incident to the Rotterdam Convention under Article 6.

At the BRS Conference of Parties in May 2015, the Designated National Authorities for Georgia (Irma Tskvitinidze) and Kyrgyzstan (Jamal Kadoeva) raised points from the floor at a side event on protecting vulnerable groups from hazardous pesticides. They declared their support for the work that was undertaken and confirmed the value of continuing such efforts to understand the impacts of pesticides.

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An interview with Dr Francisca Katagira

PRINCIPAL AGRICULTURAL OFFICER IN THE MINISTRY OF AGRICULTURE FOOD SECURITY AND COOPERATIVES, AND DESIGNATED NATIONAL AUTHORITY FOR THE ROTTERDAM CONVENTION, DAR ES SALAAM, 26 FEBRUARY 2008.

Dr Katagira describes activities that were supported under a project called 'Pesticides and Poverty'[1], a project that was implemented by PAN-UK

Dr Francisca Katagira Photo: PAN-UK

"Through Pesticides and Poverty Project, awareness has been created to know the hazards of pesticides, and for representatives of different stakeholders to see how pesticides can contribute to poverty. We have initiated community-based pesticide monitoring - something which is quite new – nobody has done it here – of course we have not done it in detail, but we have done the preliminaries and we had even a meeting with leaders from top level to village level, and everybody was saying that was the first time people from the villages met with the bosses from the regional office and aired their views in discussion with them.

Through the project we came to know that farmers use a lot of pesticide unnecessarily. For example, here we register pesticides by trade names. A farmer having a pest problem can buy the same pesticide under two different names and then mix them in the same spray tank, thinking that he has applied two different products, and that ends up being an overdose, and again a person uses more money.

Their spraying practice also leaves a lot to be desired. I remember on one of the farms a man was spraying - barefooted, no shirt - and his wife with a small baby had brought some food to him. These are the sort of things we need to train people so they will know the hazards of pesticide. If these local people can be trained to identify what chemicals they need, and use them cautiously, it can help them to be healthier and save money.

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The sustainability is there – I'm the Designated National Authority for the Rotterdam Convention, so during the training they have considered also the implementation of the Rotterdam Convention, and that's how the Community-based monitoring came in, because we are using chemicals, and we have never identified which ones are severely hazardous; we have never notified to the Convention Secretariat any of the pesticides as being hazardous to human health and development, so that it can be included in the PIC process.

So this aspect of the ecotoxicology and the initiation of community-based monitoring is leading us to identification of pesticides hazardous to human health and the environment. And we are going to sustain it, once we start it. It will be a continuous process, so that what we register now, the sustainability of that product in the market will depend on whether it is user-friendly to human health and the environment. If it's not, we will just de-register it! We want only to use safe chemicals so this is going to be a sustainable activity.

The Ministry is very interested and has started providing some small money to undertake this activity – initiation of community-based monitoring to the "hot spots", areas where we think the problem is – so this is going to be sustainable. Even this year we went to the area where they grow a lot of vegetables and use a lot of pesticides, and we have identified farmers whom we are going to train so they can start doing monitoring."

Endnote

1. Pesticides & Poverty aimed to assist developing countries to effectively implement chemical conventions and promote sustainable livelihoods, integrating an environmental dimension into development priorities. The three year project was primarily funded by the Development DG of the European Commission, with support from the Africa Stockpiles Programme, and ended in June 2008.

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Learning lessons from endosulfan?

The journey from the development and launch of endosulfan in the 1950's to its eventual listing by the Rotterdam and Stockholm Conventions in 2011 and current support for safer alternatives, was a long and difficult one. Are there lessons that we can learn and apply to other hazardous pesticides?

The persistent organochlorine pesticide endosulfan was very widely used on a large variety of pests in many crops. As a relatively cheap and broad spectrum pesticide it was a popular choice for many farmers. However, it had very serious effects on health and the environment. The most damage to health occurred in poorer countries where controls are weak, few end users use protective equipment and there is little monitoring of adverse effects.

Perhaps the most notorious incidents occurred in Kasargod District in Kerala, India, where The Plantation Corporation of Kerala used aerial spraying of endosulfan on cashew crops from 1977-2002. Local people suffered extraordinarily high incidents of foetal and developmental abnormalities, hormone disruption, severe rashes and other problems.

ENDOSULFAN USE ON WEST AFRICAN COTTON

Endosulfan was introduced in cotton production in francophone West Africa over the 1999/2000 season, as part of a regional programme to combat pyrethroid insecticide resistance in the bollworm Helicoverpa armigera. Successful use of endosulfan in Australian cotton to combat bollworm resistance to pyrethroids encouraged regulators to proceed. However, endosulfan already had a reputation as a highly hazardous pesticide, particularly under poor conditions of use.

In the first season of its introduction, official sources in Benin stated that at least 37 people died in the northern Borgou province due to endosulfan poisoning, while another 36 people experienced serious ill health. An NGO in Benin, OBEPAB, estimated 70 deaths were caused by endosulfan in that single season across the whole country. From that year OBEPAB started careful documentation of poisoning cases in different parts of the country, while similar efforts were going on in Senegal, Mali and Burkina Faso. The Toxicology Division of the Public Hospital of Lomé-Tokoin in Togo registered over 500 annual poisoning cases linked to endosulfan. Together, these efforts proved invaluable in alerting West African decision makers to the real circumstances and problems of endosulfan and other hazardous pesticides in use in smallholder production, contributing in large part to the decision by the regional CILSS Sahel Pesticides Committee in 2007 to stop endosulfan distribution and ban its use a year later.

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EVENTS SINCE 2002

2002	The US EPA determined that endosulfan residues on food and in water pose unacceptable risks; they allowed endosulfan to stay on the US market, but imposed restrictions on its agricultural uses.
2006	Endosulfan was banned in the EU A study in France found endosulfan in the air inside 79% of homes in the Paris area, apparently the result of drift and contaminated plant matter, such as fruit (UNEP/FAO, 2006).
2007	Endosulfan banned in nine Sahelian CILSS countries. The EU provides a dossier to POPRC for the inclusion of endosulfan in the Stockholm convention
2008	Endosulfan recommended for inclusion in the Rotterdam Convention on Prior Informed Consent and the list of chemicals banned under the Stockholm Convention on Persistent Organic Pollutants. The Canadian government announce that endosulfan is under consideration for phase-out. Bayer CropScience voluntarily withdraw its endosulfan products from the U.S. market but continue to sell the products elsewhere.
2011	A group of firms led by Bayer CropScience launched (and lost) a legal bid to overturn the EU ban. Decision not achieved on the addition of endosulfan to the Rotterdam Convention. In the US, a coalition of farmworkers, and health and environmental groups filed a lawsuit against the EPA to stop the continued use of endosulfan. Endosulfan listed under annex III to the Rotterdam Convention. Endosulfan listed by the Stockholm Convention for elimination of production and use worldwide. The Indian Supreme Court banned the production of endosulfan.
2013	The COP accepted guidance documents on alternatives to endosulfan from the POPs Review Committee and recommended priority be given to ecosystem-based approaches to pest management.

Since 2011 the task for governments has been to enact and enforce the Stockholm ban on endosulfan and to help farmers to adopt safer alternatives. The Rotterdam Convention is supporting practical initiatives such as 'Growing Coffee without Endosulfan', a project that shares the practical experience of large and small coffee farmers in different countries who have successfully replaced endosulfan with safer and economically viable alternatives[1]. It demonstrates that phasing out of Highly Hazardous Pesticides (HHPs) in favour of safe and cost-effective alternatives is entirely possible.

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WHICH LESSONS CAN WE LEARN?

Perhaps the example in West Africa is particularly instructive. Some of the issues that emerged there included:

- Initial assessments assumed that experience in Australia would translate to West Africa, without taking sufficient account of the differences in conditions of use, such as poor education, low levels of PPE use and frequent use of cotton pesticides on food crops.
- NGOs, medical services and regulatory authorities all played important roles in collecting evidence of harm from endosulfan. The collection of such data was vital, as was the ability of the regulatory authorities in the region to review the new evidence and take action accordingly.
- The prevailing assumption that endosulfan was necessary for the economic control of some pests has proved to be false. While there is no simple alternative that is suitable in all the circumstances where endosulfan was previously used, experience has shown that safer, economically viable alternatives are available.

"We used to spray endosulfan twice a year but we've found using traps is cheaper, easier and far less dangerous than using chemicals. For the workers it's much easier to set and maintain the traps than carry a heavy sprayer."

Mr Abelino Escobar, El Salvador.

A coffee estate manager from El Salvador shares his experience of using safer alternatives to endosulfan.

Source: FAO (2015) *Phasing out Highly Hazardous Pesticides is possible! Farmer experiences in growing coffee without endosulfan.* http://www.fao.org/3/a-i4573e.pdf

Endnote

1. FAO (2015) Phasing out Highly Hazardous Pesticides is possible! Farmer experiences in growing coffee without Endosulfan. http://www.fao.org/3/a-i4573e.pdf

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Experience of phasing out Highly Hazardous Pesticides and promoting alternatives in Costa Rica[1]

In Costa Rica, a multistakeholder project has brought together decision makers in government agencies, farmers cultivating at small, medium and large scales and civil society organisations including NGOs, trades unions, researchers and students to address the problems caused by HHPs to human health, biodiversity and natural resources. It is being implemented by the Regional Institute for Research on Toxic Substances (IRET), collaborating with the National University and the National SAICM Focal Point in the Ministry of Environment (MINAE).

ASSESSMENT

Analysis of pesticide import data from the State Phytosanitary Service 2009-14 revealed that 80% of 13 million kg of active ingredient imported in 2014 qualify as HHPs, according to the hazard criteria selected by PAN International. 21 registered active ingredients are acutely toxic HHPs (WHO 1a or 1b), 7 are toxic to reproduction, 36 are probable or possible carcinogens and 23 are endocrine disruptors. The fungicide mancozeb comprises the largest volume HHP used nationally, particularly in bananas and pineapple.

Detailed surveys of pesticide use in the 2015 season were conducted with 90 coffee farms and 12 pineapple estates. In coffee, 18 different HHPs were reported in use, comprising 62% of all pesticide active ingredients in this crop and averaging 2.4kh/ha across the national coffee area. For pineapple, 8 HHPs are in use (44% of pesticides used), averaging 29.5 kg/ha.

Study of HHPs and risky practices in Costa Rica Photo: PAN-UK

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ADAPTING POLICY TO CONSIDER HHPS

The project is recommending specific attention to HHPs under government proposals for a National Plan for Chemical Safety, under the auspices of the multi-stakeholder Secretariat for Chemicals Management. This would include public right to know on HHP imports and use, plans for phase out of priority HHPs and replacement with ecological methods, and actions for safer working conditions on farms. In terms of pesticide approvals, IRET is lobbying for government commitment not to register further HHPs. Concerns are being raised by IRET and the Ministry of Environment about several newer generation actives in the regulatory process, which, while not acutely toxic to humans, are very persistent in the environment and highly hazardous to aquatic organisms.

REVISING LEGISLATION

The project team at IRET were invited to contribute to the pesticide legislation consultation, Aug. 2016. With other NGO participants, they successfully argued for ceasing 'by default' temporary registrations without adequate data. However, proposed changes to the arrangement for 'by analogy' or equivalence registration of actives already approved in EU or US based only on the data submitted to those authorities, and without any Costa Rican data, were not adopted.

PROMOTING SAFER ALTERNATIVES

As an alternative to the acutely toxic nematicide ethoprophos used in pineapple, trials have been conducted on two fungal-based biopesticides and pyrrolygnic acid from burnt wood. Preliminary results suggest that these treatments can work as well as ethoprophos.

In coffee, alternatives to the HHP fungicides triadimenol, epoxiconazole and pyraclostrobin were assessed for control of coffee leaf rust disease. Alternatives comprised two biopesticides, two mineral compound mixtures and one botanical extract, two non-HHP fungicides, along with a combination of a biological product and a reduced dose of a non-HHP fungicide. Non-HHP fungicides gave the best performance, closely followed by the combination with a botanical. This shows that it's possible to produce good yields while avoiding HHP fungicides.

RAISING AWARENESS OF HHPS AND THE NEED FOR RISK REDUCTION

A key part of the work has been to make contact with key stakeholders in order to explain the risks from HHPs and opportunities to reduce them, particularly the use of safer alternatives. Presentations and discussions have taken place with the following:

- **Decision-makers**
  Regular presentations to the Ministry of Agriculture
  Other ministries: Health, Environment, External Relations, Ministry of Interior Customs Bureau
  The State Phytosanitary Service

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The Council for Occupational Health

The Secretariat for Chemicals Management

National Coffee Institute

- **The farming sector**

  Pineapple Growers and Exporters' Chamber of Commerce

  Coffee co-operatives and exporters

  One large coffee estate

  Sugarcane growers association

  Certification standards

  Supply chain actors

  Trade unions

- **NGOs and CSOs**[2]

  National Union of Chambers of Commerce

  National Council of University Rectors

  NGOs working on chemical safety.

- **Sustainability standards**

  Fairtrade

  Rainforest Alliance

- **Academic institutions**

  National Learning Institute (technical training)

  Students and staff from 4 state universities

- **Regional conference**

  The project was jointly presented by IRET, The National Technical Training Institute (INA), State Phytosanitary Service and farmers to a regional level conference for Latin American Association of Sociologists on the International Day of No Pesticide Use.

Training on HHPs and alternatives has been provided to 70 coffee farmers, extension agents and agronomy students with universities and national technical training institute INA. Leaflets and publications have been disseminated to grower, exporter and certification standards in coffee sector as well as farmers and farm managers.

Project results and lessons will be assessed and shared via a Central American regional workshop, hosted by IRET. Results will be shared with various stakeholders at national level as well as certification standards, retailers and the FAO JPMP HHP Working Group.

Endnotes

1. A project supported by the Quick Start Program of SAICM (Strategic Approach to International Chemicals Management), administered by UNEP in Geneva, Switzerland. The project coordinating agency is the Regional Institute for Research on Toxic Substances (IRET), based at the National University of Costa Rica (UNA) and PAN UK provides additional expertise.
2. Civil Society Organisations

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Appendicies

1. Article 6
2. Annex IV
3. Template for concept note
4. Example budget for two years
5. Example workplan

Article 6

PROCEDURES FOR SEVERELY HAZARDOUS PESTICIDE FORMULATIONS

1. Any Party that is a developing country or a country with an economy in transition and that is experiencing problems caused by a severely hazardous pesticide formulation under conditions of use in its territory, may propose to the Secretariat the listing of the severely hazardous pesticide formulation in Annex III. In developing a proposal, the Party may draw upon technical expertise from any relevant source. The proposal shall contain the information required by part 1 of Annex IV.
2. The Secretariat shall, as soon as possible, and in any event no later than six months after receipt of a proposal under paragraph 1, verify whether the proposal contains the information required by part 1 of Annex IV. If the proposal contains the information required, the Secretariat shall forthwith forward to all Parties a summary of the information received. If the proposal does not contain the information required, it shall inform the proposing Party accordingly.
3. The Secretariat shall collect the additional information set out in part 2 of Annex IV regarding the proposal forwarded under paragraph 2.
4. When the requirements of paragraphs 2 and 3 above have been fulfilled with regard to a particular severely hazardous pesticide formulation, the Secretariat shall forward the proposal and the related information to the Chemical Review Committee.
5. The Chemical Review Committee shall review the information provided in the proposal and the additional information collected and, in accordance with the criteria set out in part 3 of Annex IV, recommend to the Conference of the Parties whether the severely hazardous pesticide formulation in question should be made subject to the Prior Informed Consent procedure and, accordingly, be listed in Annex III.

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Annex IV

INFORMATION AND CRITERIA FOR LISTING SEVERELY HAZARDOUS PESTICIDE

FORMULATIONS IN ANNEX III

Part 1. Documentation required from a proposing Party

Proposals submitted pursuant to paragraph 1 of Article 6 shall include adequate documentation containing the following information:

a. Name of the hazardous pesticide formulation
b. Name of the active ingredient or ingredients in the formulation
c. Relative amount of each active ingredient in the formulation
d. Type of formulation
e. Trade names and names of the producers, if available
f. Common and recognized patterns of use of the formulation within the proposing Party
g. A clear description of incidents related to the problem, including the adverse effects and the way in which the formulation was used
h. Any regulatory, administrative or other measure taken, or intended to be taken, by the proposing Party in response to such incidents

Part 2. Information to be collected by the Secretariat

Pursuant to paragraph 3 of Article 6, the Secretariat shall collect relevant information relating to the formulation, including:

a. The physico-chemical, toxicological and ecotoxicological properties of the formulation
b. The existence of handling or applicator restrictions in other States
c. Information on incidents related to the formulation in other States
d. Information submitted by other Parties, international organizations, non-governmental organizations or other relevant sources, whether national or international
e. Risk and/or hazard evaluations, where available
f. Indications, if available, of the extent of use of the formulation, such as the number of registrations or production or sales quantity
g. Other formulations of the pesticide in question, and incidents, if any, relating to these formulations
h. Alternative pestcontrol practices
i. Other information which the Chemical Review Committee may identify as relevant

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Part 3. Criteria for listing severely hazardous pesticide formulations in Annex III

In reviewing the proposals forwarded by the Secretariat pursuant to paragraph 5 of Article 6, the Chemical Review Committee shall take into account:

a. The reliability of the evidence indicating that use of the formulation, in accordance with common or recognized practices within the proposing Party, resulted in the reported incidents
b. The relevance of such incidents to other States with similar climate, conditions and patterns of use of the formulation
c. The existence of handling or applicator restrictions involving technology or techniques that may not be reasonably or widely applied in States lacking the necessary infrastructure
d. The significance of reported effects in relation to the quantity of the formulation used
e. That intentional misuse is not in itself an adequate reason to list a formulation in Annex III

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Template for concept note

This template is a suggestion only.

Title page

Title

Institution(s) applying for support

Country / countries

Duration; how long do you expect to take to complete the project?

Date

Contact; **name, job title, organization, contact details**

Summary – 1-2 paragraphs

Rationale

- Problems / issues to be addressed
- Who will benefit, and how many?
- How will your proposal address the problem?
- Past and related work

Outcomes – what changes do you expect in the medium term as a result of your project? E.g. tighter regulation of severely hazardous pesticide formulations; increased reporting of pesticide poisoning incidents; increased protection of farmers and their families/ communities; increased protection of environment.

Outputs – what will you have to show for your work at the end of the project? E.g. SHPF forms completed; reports; changes in regulations, numbers of people trained.

Activities – describe your planned activities and methods, including the scale of the activity

Project management; which institutions and individuals will be involved in delivery and what will their respective roles be?

Technical support; what kind of support are you asking for?

ANNEXES

Annex 1 Budget

Annex 2 Work Plan

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Example: BUDGET OUTLINE FOR TWO YEARS

This template is a suggestion only.

	Items Description	Year 1	Year 2	Total
1	HUMAN RESOURCE INPUTS (Staff time and consultants...)			
1.1	Management and finance			
1.2	Salaries technical staff			
1.3	Salaries field staff (e.g. enumerators)			
1.4	National consultants (e.g. interpretation)			
1.5	Consultant: (e.g. laboratory services, translations services)			
	Sub-total Category Human resource costs			
2	EXPENDABLE EQUIPMENT ANCILARY TO SERVICES			
2.1	Office supplies			
2.2	Printing			
2.3	Sampling equipment			
2.4	Mobile phones, GPS, laptops for data recording			
	Sub-total Category Supplies and Equipment			
3	TRAVEL (Flights, inland travel, board and lodging costs...)			
3.1	Travel for consultations, data collection, sampling			
3.2	Daily subsistence allowance to cover staff meals, accommodation when in the field			
	Sub-total Category Travel			
4	GENERAL OPERATING AND MAINTENANCE EXPENSES			
4.1				
	Sub-total Category O&M expenses			
5	MEETINGS			
5.1	Venue			
5.2	Refreshments			
	Sub-total Category Meetings			
6	REPORT DRAFTING			
6.1	Reporting			
	Sub-total Category Report Drafting			
	TOTAL COSTS			

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Example workplan

This template is a suggestion only.

Outcome	Output	Main activity	Activity	Task	Months 1	2	3	4	Continue to final month	24
1	Improved protection of public health from hazardous pesticides									
	Survey tools and reports									
		Collecting data from end users								
			Consultation							
				Elaborate workplan in consultation with the national partner, MoA, the DNA and other key decision-makers						
			Develop questionnaire							
				Draft questionnaire						
				Translate questionnaire						
				Field test and refine questionnaire						
			Train survey team							
				Develop training materials						
				Deliver training and field testing workshop						
				Provide ongoing technical support to the survey team						
			Collect and analyse survey data							
				Survey / data collection						
				Promotion of safer use at community level						
				Checking of data and feedback to field staff						
				Data analysis						
				Write survey report						
	Draft discussion paper and risk based recommendations									
		Developing risk-based priorities for development of safer alternatives and practices								
			Identification of pesticides in use							
				Gather information from consultations with farmers, retailers and field observations						
			Sampling and analysis							
				Procure services and equipment required						
				Sampling and analysis						
	Action plan									
		Support competent authorities and key stakeholders to agree an action plan for risk reduction from pesticides								
				Consult with key stakeholders						
				Consultation meetings						
				Refine recommendations						
				Circulate discussion paper						
				National workshop and action planning						
				Workshop report						
				Final report						

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ROTTERDAM CONVENTION