

Environmental Management Tool Kit for Obsolete Pesticides



Volume 1

- A. Environmental risk assessment
- B. Prioritization of stores
- C. Regional prioritization and risk tracking

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Foreword

This is Volume 1 of the FAO Environmental Management Tool Kit (EMTK) for Obsolete Pesticides. To avoid confusion, it is important to state that this tool kit *does not* provide a format for developing environmental impact assessments (EIAs), nor does it provide guidance on completing an environmental assessment or a strategic environmental assessment. Instead, this tool kit provides a practical set of methodologies to assist countries in the *risk-based* management of obsolete pesticides based on *objective* chemical and environmental criteria that can be used to develop an effective environmental management plan (EMP) for obsolete pesticides.

The approach presented in Volume 1 is based on the concept of *environmental risk assessment*. As far as possible, the methodologies developed use data that can be collected easily in the field and used to determine the risk posed by obsolete pesticides to both public health and the environment. The tool kit aims to eliminate the *subjective* component in risk assessment by providing a format that – after its users have been trained – will produce the same results, irrespective of who completes an assessment. The methodologies are therefore designed to be reproducible and robust (able to withstand examination from environmental specialists) and to reflect the real-life situation in the field.

When FAO started to develop this tool kit, it soon became apparent that none of the existing formats for EIA and environmental assessment could be adapted for direct application to the needs of environmentally sound management of obsolete pesticides. FAO has therefore developed a new system, which operates from the bottom up and is based on information that can be provided by trained local teams. The following set of tools was built up with significant input from specialist consultants, other development partners, CropLife International and a variety of national experts from country project management teams involved in obsolete pesticide disposal projects. The tools were developed based on real situations experienced in locations where obsolete pesticides are currently found. FAO wishes to thank the country teams from Eritrea, Ethiopia, Mozambique, the Syrian Arab Republic and the United Republic of Tanzania, which contributed to the formulation of this document.

At the outset it is important to provide some practical reasons for developing the tool kit by answering the simple questions: How do pesticide managers prioritize affected stores when they are developing a remediation strategy but lack the necessary funding to dispose of all the obsolete pesticides in a country? How do they decide where to start working, and how do they assess whether the work they are doing is having a direct impact on reducing the risk posed by obsolete pesticides to public health and the environment? In past projects, the prioritization of stores has often been based on the assessment of an international expert or consultant. The results have therefore been largely dependent on the relative expertise of the consultant concerned, and have not followed a standardized approach to the prioritization process. In some instances, rather than basing prioritization on the relative risk posed by each store, a project has been prioritized on the basis of geographic location or political influence, which can result in the worst affected stores not being addressed. This situation has led FAO, in partnership with other agencies and bodies involved in the management of obsolete pesticides, to develop a system for prioritizing affected storage locations based on *risk*.

From the outset, one of the key reasons for developing the tools described in this document was to design a system that uses local resources and that is as self-reliant as possible. Tool development was based on a review of various methodologies and the selection of criteria and

formats that accurately reflect the decision-making process of experts with expertise in every aspect of managing obsolete pesticides. The resulting set of tools will help relatively inexperienced users to draw the same overall conclusions as would be drawn by specialists with many years of experience in obsolete pesticide projects and environmental assessment. National teams can therefore base their decision-making on outputs that are consistent with the conclusions of external, specialist consultants.

The tool kit is accompanied by a training package that aims to develop national capacity to apply the methodologies described. Following a two-week training session, national teams will be able to complete the entire process of risk assessment and management plan development.

To help national teams use the tool kit to prioritize stores and develop a risk-based remediation or *safeguarding* strategy, this guideline sets out a process for assessing the comparative risk posed by each of the locations where obsolete pesticides are currently stored. Only by comparing the relative risks of all affected stores can pesticide managers determine where their limited resources should be focused and where they must start work to eliminate the immediate risk posed by the worst affected stores. By adopting the risk-based approach, managers can develop a system for monitoring progress as stores are remediated; once the most affected stores have been cleaned up, the risks to public health and the environment will automatically be reduced. This can be used as a *performance indicator* for project monitoring and evaluation. The tool kit provides a simple, easily managed system for establishing the comparative risks posed by all storage locations, and a mechanism for monitoring reductions in the overall risk posed by obsolete pesticides during the various stages of their repackaging, transportation and final disposal. Without such a system, there is no quantifiable way of demonstrating that a clean-up process is effectively reducing the risk posed by obsolete pesticides.

For ease of reference, Volume 1 of the tool kit has been divided into tools A, B and C. Tools A and B outline a methodology for quantifying the risk a store poses to public health and the environment through assessing the potential impacts from the chemicals in the store and from the fabric and location of the store in relation to its general environment. These tools rely on a series of calculations that have been developed specifically for this purpose. The information collected by tools A and B is then used to develop a strategy for prioritizing the affected stores; tool C examines how management teams can use data from tools A and B to plan a project aimed at reducing the overall risk posed by obsolete stocks at the national, provincial or regional level.

The tool kit aims to meet the needs of countries setting out on the long and complex process of managing their obsolete pesticide stocks effectively. It provides country teams with simple guidance on how to gather and interpret information on obsolete stocks, and use it to develop a coherent, risk-based strategy for the environmentally sound management of those obsolete pesticides. Through consultation with experts and country teams from developing countries, the series of methodologies developed is based on practical experience of project implementation. The tool kit seeks to avoid very theoretical and impractical methods that rely on high levels of national capacity in such areas as EIA. Although experience in environmental issues, chemical management and such concepts as hazard and risk are an advantage, the accompanying training course provides the necessary skills to finalize a meaningful set of outputs. Adoption of the tool kit methodologies makes it possible to manage obsolete pesticides in ways that are safe and environmentally sound.

This guideline is an integral part of the FAO Pesticide Disposal Series; complementary volumes in the series cover such aspects as the inventory, disposal and prevention of obsolete pesticides. Much of the system presented here has been integrated into the FAO Pesticide Stock Management System (PSMS), a web-based database that uses data from inventories and environmental assessments to prioritize stores on the basis of risk. The calculations and processes presented in this guideline are those used in PSMS¹.

¹ For further information on the guidelines in the FAO Pesticide Disposal Series and associated training modules please contact the FAO Prevention and Disposal of Obsolete Pesticides Unit at opgroup@fao.org.

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Acronyms

CESA	country environmental and social assessment
EA	environmental assessment
EIA	environmental impact assessment
EMP	environmental management plan
EMTK	Environmental Management Tool Kit
ERA	environmental risk assessment
F _E	risk factor (environment)
F _P	risk factor (pesticides)
GIS	Geographic Information System
GPS	global positioning system
NGO	non-governmental organization
NRF	national risk factor
OM	operational manual
PMU	project management unit
PSMS	Pesticide Stock Management System
UN	United Nations
WHO	World Health Organization

Introducing the FAO Environmental Management Tool Kit for Obsolete Pesticides

Background

Stocks of obsolete, unwanted and banned pesticides continue to represent a serious public health and environmental threat, particularly in developing countries. FAO supports national management teams in establishing strategies for completing national assessments of obsolete pesticides that result in the environmentally sound management and final disposal of the pesticides. The Environmental Management Tool Kit (EMTK) forms an integral component of that technical support. It is part of a series of guidelines and systems designed to assist countries in assessing the scope of the obsolete pesticides problem and implementing effective prevention and disposal. For ease of application, EMTK is presented in three volumes: Volume 1 focuses on issues related to inventory and the prioritization of stores based on environmental risk; Volume 2 focuses on the selection and management of stores and collection centres and the transport of waste pesticides to these points; and Volume 3 focuses on the development of country environmental assessments and environmental management plan (EMPs).

The three volumes of EMTK can be used as a planning system to assist governments and cooperation agencies in planning all the steps of a disposal programme for obsolete pesticides that may have an adverse impact on the environment and the health of the general public.² Volume 1 guides the objective setting of priorities for such a programme, taking into consideration the environmental and public health risks. Prioritization is particularly important when funds are limited and it is not possible to dispose of all the pesticides listed in a country's national inventory.

This document does not provide guidelines for the implementation of safeguarding measures during repackaging exercises. The safeguarding of obsolete pesticide stockpiles is one of the most technically complex steps in an obsolete pesticide disposal programme, and specific environmental control and mitigation measures must be planned and implemented. A separate FAO guidance document focusing on the management of obsolete pesticide repackaging and safeguarding is available. More details can be obtained from FAO.

Objectives

Elaboration of the tools contained in EMTK was based on experiences from the various obsolete pesticide programmes that FAO has supported in developing countries since 1994. The tools aim to:

- provide better knowledge about the fundamentals of environmental management planning associated with the inventory, storage and transportation of obsolete, unwanted and banned pesticides;
- increase project teams' awareness of the public health and environmental risks from obsolete pesticides;
- improve protection of the public and the environment from the hazards posed by obsolete pesticides by facilitating the implementation of risk assessment, control and mitigation strategies through step-by-step guidelines;

² Advice on environmental protection during the safeguarding (repackaging) of obsolete pesticides is covered in EMTK Volume 3 and other specific guidance based on international best practice.

- provide project administrators with the outputs necessary to develop integrated and standardized procedures that protect both human health and the environment.

Audience

EMTK has been developed for:

- **country project managers** in charge of national obsolete pesticide programmes, to help them devise and develop EMPs for risk reduction;
- **officers** of government **ministries of agriculture, environment and health**, to support them in collecting information in the field and appraising the conditions of each store containing obsolete pesticides;
- **regional and district officers** and **trained storekeepers**, to help them assess the environmental and public health situation prevailing in the store(s) for which they are responsible.

Presentation

EMTK utilizes the FAO standard inventory data collection forms developed for use with the FAO Pesticide Stock Management System (PSMS). Volume 1 focuses on environmental risk assessment (ERA) of storage locations. Volume 2 focuses on the selection of storage points for use during the safeguarding phase of a disposal project, the management of these locations, and the safe transportation of obsolete pesticide stockpiles from outlying stores to them. Volume 3 focuses on the preparation of country environmental assessments and the development of EMPs for the most critical sites identified in tool C of Volume 1. The tools contained in Volumes 1 and 2, along with others in the FAO Pesticide Disposal Series, are complementary and produce outputs that can be used to generate country environmental assessments and site-specific EMPs, as presented in Volume 3.

The following is a brief description of the tools contained in EMTK Volume 1:

- Tool A collects and analyses additional information in order to appraise the environmental and public health risks associated with each stock of pesticides.
- Tool B identifies the most dangerous stores by ranking them according to environmental and public health priorities based on risk assessment. It uses the results of a questionnaire provided in tool A.
- Tool C provides a methodology for identifying, classifying and selecting the regions where stocks of obsolete pesticides are accumulated, which should receive prior attention. It also provides a risk reduction performance indicator that can be used to monitor projects.

Overview of the management of obsolete pesticides

ERA of obsolete pesticides is just one of many steps in an effective management cycle. It is a critical stage in the overall project design process. Figure 1 provides a step-by-step outline of the stages in implementing an obsolete pesticide disposal project. Without accurate inventory and data, it will not be possible to plan any subsequent safeguarding and disposal activities. Each of the steps is described in greater detail in the following sections, along with sources of additional information on activities.

As Figure 1 shows, irrespective of the final safeguarding and disposal option selected for the obsolete pesticides, the entire management process for all obsolete pesticide projects relies on three key activities: inventory, environmental assessment and safeguarding. FAO provides separate technical guidance on managing the inventory process and safeguarding activities; another disposal guideline assists countries in developing a disposal strategy based on inventory data and the most appropriate technologies for the environmentally sound management of waste chemicals. EMTK Volumes 1, 2 and 3 complete this set of reference texts, which help countries to plan the entire management process from project inception to completion – the “cradle to grave” approach.

FIGURE 1
OUTLINE OF THE MANAGEMENT PROCESS FOR OBSOLETE PESTICIDES

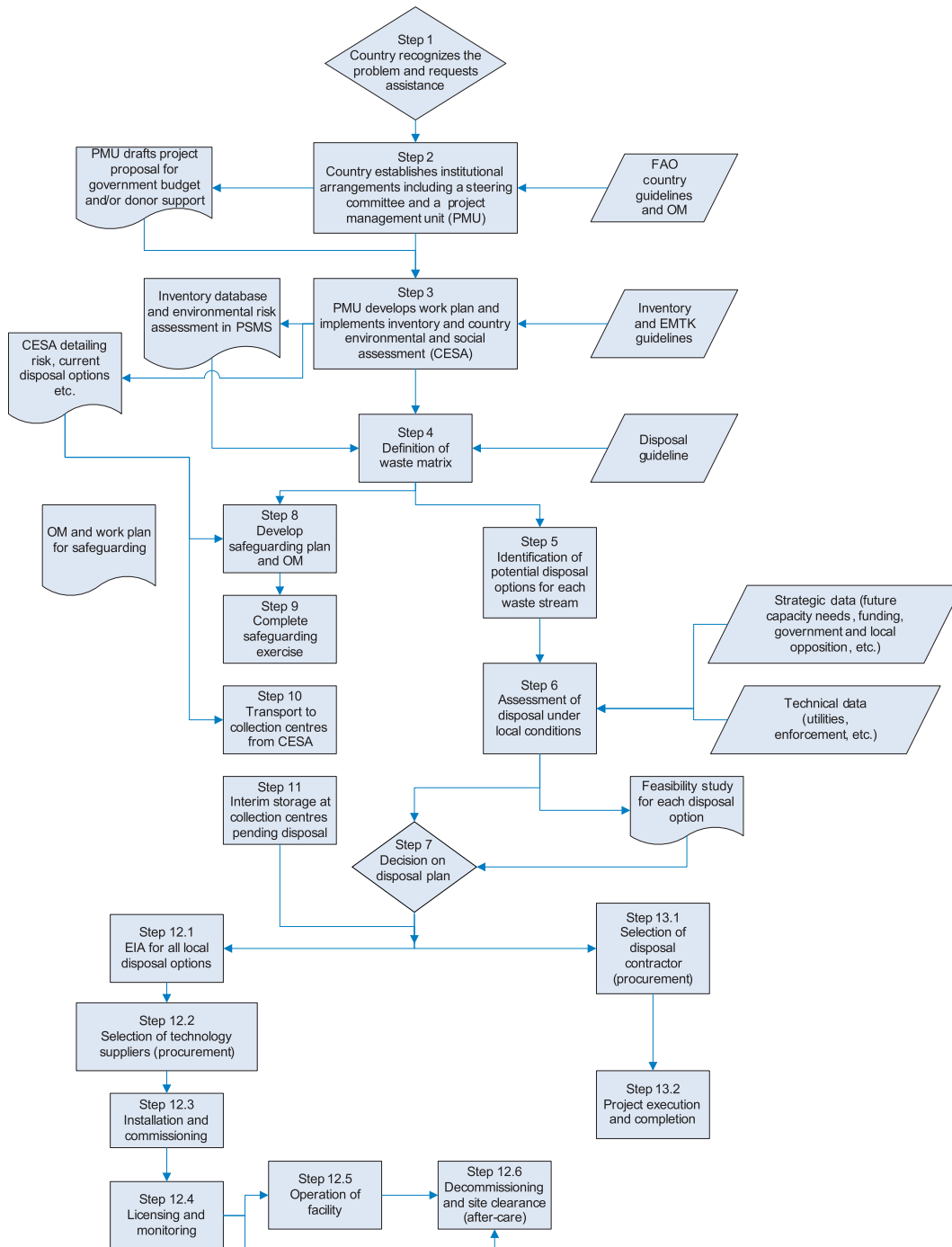
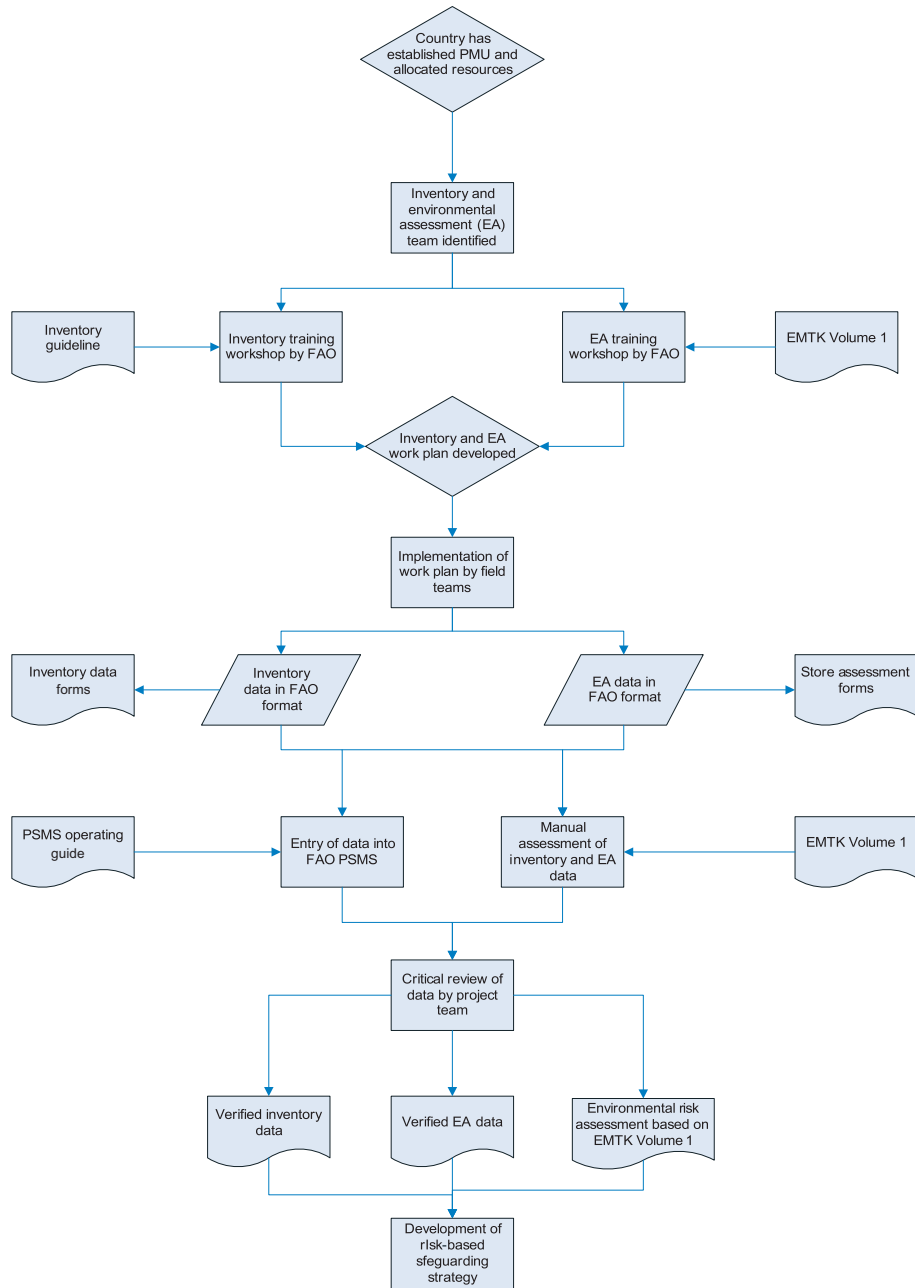


FIGURE 2
OUTLINE OF THE INVENTORY AND ENVIRONMENTAL ASSESSMENT PROCESS



Steps 1 to 3: Project design and preparation

The design or preparation phase is critical and has a direct impact on the country's ability to implement a project effectively. Efforts made at this stage of the project should be considered investments to ensure successful implementation. A country will need to:

- attract the support of a high-level project sponsor within government;
- establish a committed and competent implementation team within one of the key government departments;
- allocate sufficient resources for project development;
- ensure cooperation from different government departments and buy-in from local communities and civil society, which are typically represented by national non-governmental organizations (NGOs).

This process is supported by:

- FAO technical advice on project design and formulation;
- training of national staff in inventory, environmental assessment and safeguarding;
- FAO technical guidelines on establishing a country team, organizing an inventory and environmental and risk assessments and developing a meaningful project budget;
- an operational manual (OM) providing an outline framework to guide formulation of all the necessary project procedures and work plans;
- other inputs from potential key partners such as international NGOs, financial institutions, including the World Bank, and other members of the United Nations (UN) family dealing with waste issues, including the Secretariats of the Basel, Stockholm and Rotterdam Conventions.

The outputs of the design stage of the project should include:

- a detailed project scoping document based on research and existing baseline data available to the project team;
- a project funding proposal directed to the national government treasury and/or the international donor community;
- a country OM based on the FAO framework and providing details of all procedures, operating standards and implementation systems to be followed during project implementation;
- depending on budget allocation, a complete inventory in FAO format;
- a comprehensive country EMP, based on the inventory data and application of the tools described in this document.

These outputs and the inventory data are critical features of step 3, as indicated in Figure 1. The outputs from tools A, B and C rely on the inventory data collected by field teams; application of the tools then allows critical aspects of the EMP to be completed and an effective disposal strategy to be developed.

Figure 2 illustrates the steps involved in applying EMTK during the project preparation phase. It shows:

- the inter-relationship between the inventory and the collection of environmental assessment data;
- the stages to which EMTK Volume 1 provides direct input;
- linkages to the automated risk assessment process developed in PSMS;
- the outputs from the project preparation phase.

It should be stressed that the EMTK system for risk assessment uses information collected during the inventory process. Although the system is applied automatically in PSMS, this guideline describes the basis from which the system operates.

Tool A

Environmental risk assessment

This tool utilizes the data collected via the FAO standard inventory data collection forms developed for use with the FAO PSMS. Copies of the forms are presented in the Annexes. In addition to the standard inventory information, which consists of data on the products contained in a store, the tool also requires that data be collected to facilitate appraisal of the environmental and public health risks associated with each obsolete pesticide storage location. It includes an easy-to-use questionnaire for gathering information that is relevant and as objective as possible from each store. In association with tool B, tool A also allows the user to rank and prioritize stores according to their levels of risk, and to characterize the situation prevailing in each store as lower-priority, problematic or critical.

FAO finalized the model proposed in this tool after extensive field tests in several countries. The tool is based on the risk assessment associated with the chemicals (pesticides), the physical and management conditions of the store, and the environmental conditions prevailing in and at the store. Field trials have shown the methodology to be robust, easily understood and easy to use.

Objectives of the tool

The basic assumption of this tool is that it is possible to gather – easily and rapidly – the essential information for appraising the environmental and public health risks associated with any stock of obsolete pesticides and identifying the stores with the worst conditions in terms of current or potential impacts on public health and/or the environment.

The aim of the tool is to gather sufficient information to provide decision-makers, experts, project managers and planners with the data necessary for:

- ranking the stores and characterizing the situation in each according to simple environmental and public health risk criteria;
- pinpointing the magnitude of the risk and prioritizing practical actions and measures for reducing it;
- devising an implementation plan based on priority actions for the disposal of obsolete pesticides;
- pre-selecting intermediate and regional collection centres for obsolete pesticides, for which a separate EIA may be required under national EIA procedures; final selection of centres is based on additional logistics, economic, public, social or political factors.

Tool A can be used for the following:

- **Ranking the stores according to the level of risk associated with the pesticides contained in each store, their toxicity and their packaging conditions:** The more pesticides contained in a store, the more toxic those pesticides are and/or the worse the condition of the packaging materials in terms of leakage, the higher the associated risk. This tool can be applied to calculate the risk factor F_p , which represents the risk related to conditions associated with the pesticides (i.e., the conditions prevailing inside the store). F_p has a linear progression; the greater the value of F_p , the higher the associated risk.
- **Ranking the stores according to the conditions of each store structure and to the storage conditions inside and the environmental conditions outside the store:** The worse the conditions associated with the store structure and the greater the store's relationship with

or proximity to critical areas, the higher the risk or potential risk to public health and the environment in case of an accident at the store. The risk factor F_E is calculated for each store, based on the results of a simple questionnaire completed for each location.

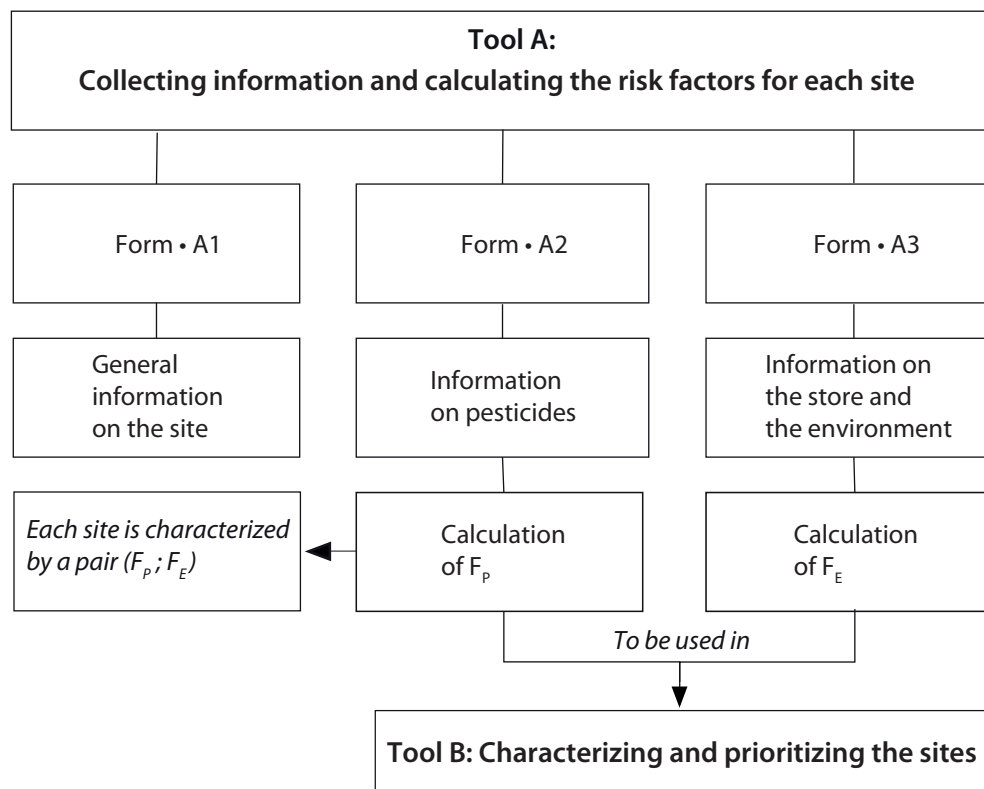
- **Characterizing the general situation prevailing in each store by combining the two risk factors F_p and F_E and plotting them on a single graph, divided into four quadrants:**
This provides a comparative analysis based on the sample population of stores included in the survey. Depending on the position of a store on the graph, the situation prevailing in that store relative to the other stores in the survey can be characterized as lower-priority, problematic (when either F_p or F_E is high) or critical (when both F_p and F_E have high values). For more information on store characterization and prioritization see tool B.

Description of the tool

Tool A includes step-by-step guidelines for calculating the risk factors, explanation boxes, and the following three forms:

- Form A1 helps the user to gather basic information on the store and its location: region, district, name, etc. If possible, the store's map coordinates and altitude should be precisely recorded, using a global positioning system (GPS) device in association with a Geographic Information System (GIS), which locates a store precisely on a map and provides relevant environmental information. The form also guides the collection of data related to: the *structure* of the store (roof, walls, floor, ventilation); and the *management and organization* of the store (security, safety and management procedures). This information is also included in the inventory, which is expected to be completed concurrently with the environmental assessment data collection.

FIGURE A1
Structure of tool A



- Form A2 aims to calculate F_p by collecting information about the pesticides located at or inside the store(s), including the *quantity*, the *World Health Organization (WHO) toxicity class* and the packaging *conditions* of each pesticide. This information can be extracted from the FAO standard inventory data collection form developed as part of PSMS and completed during the inventory exercise. Calculation of F_p is automated in PSMS, but is included here for reference and for instances when access to PSMS is not possible.
- Form A3 guides the collection of information on the *environment around the store*, including proximity to human settlements, water sources, agricultural and livestock activities, wildlife and biodiversity. These data are not typically collected by the inventory team, and the country team needs to decide whether to add them to the inventory process or use a separate team from the national/local environmental authority to collect them. Cost, resource availability and time factors have to be balanced with national mandates and potential conflicts of interest.

Information on the structure of the store is important because the store constitutes a physical barrier that may contain a potential pollution incident. Storage conditions are also important because proper management can significantly reduce the level of risk. Information on conditions outside the store allows assessment of the impact of a potential release of obsolete pesticides into the environment.

Guidelines for calculating the risk factors F_p and F_E

STEP 1

Calculating F_p (see Box A1, use Form A2)

- List all the pesticides contained in the store.
- For each pesticide, note the WHO toxicity class (of the formula, not the active ingredient), assess the conditions of the containers and calculate a score, S_p .
- Calculate F_p as the sum of all the S_p scores calculated for the individual pesticides in the store.

This process has been automated in PSMS, but it is important that operators understand the basis of the calculations and are able to complete the process manually if required.

STEP 2

Calculating F_E (see Box A2, use Form A3)

- Fill in the environmental and public health risk questionnaire (Box A2).
- For each question, apply a score 0 or 1 as indicated in the questionnaire.
- Multiply all the scores by the appropriate weighting factor.
- Calculate F_E as the sum of all the weighted scores.

This process has also been automated in the FAO PSMS, but an understanding of how it works is required.

Calculation of F_p and F_E when there are several stores at the same site

When several stores are located at the same site:

- F_p is calculated for each store;
- F_E is calculated for each store, based on its condition;
- a cumulative total for all the stores at the site can be calculated by summing the F_p scores for all the stores and assigning the highest F_E .

This methodology allows the team to ensure that:

- all badly contaminated stores are clearly identified on the basis of store-specific conditions;
- the cumulative affect of having several stores at one location is recorded and factored into the prioritization process as part of tool B. This is not a component of the automated system included in PSMS.

This approach is based on the need to ensure that when resources for clean-up are limited, only the high-risk stores at a location are prioritized. If there are leaking products and poor store conditions in one of three stores at a location, but stocks are stable and store conditions sound at the other two, the system should allow the management team to identify and prioritize the store that poses the greatest risk. Only when budget and resources allow all three stores to be dealt with should logistical considerations be factored into the prioritization process.

In Form A1:

- all fields must be completed;
- the store number is assigned by the database used to collate the information;
- latitude/altitude and longitude are derived from a GPS system;
- “owner” refers to the owner of the stocks and the administrator of the location;
- the location is given the name that is commonly used locally;
- “region”, “district” etc. refer to the geopolitical area where the store is situated;
- digital photos of relevant subjects should be attached to the electronic form – numbers for photos should relate to the store code and heading number provided in the form.

The data entered on Form A2 are derived directly from the pesticide form presented in the Annexes. The main inventory form is used to enter specific information about each of the formulations or pesticides in a store into PSMS, where it is used to calculate the WHO class for the formulation (not the active ingredient) of each entry. It is therefore important that the WHO class entered in Form A2 is that of the formulation for each data entry and not of the active ingredient. Using these data, PSMS automatically calculates the S_p for each pesticide in a store, based on the inventory data, and produces an F_p value that can be used for comparative risk assessment purposes.

As with Form A2 to calculate F_p , Form A3 for calculation of F_E provides the rationale for assigning a relative importance to each factor in the calculation. The raw data collected at the store are based on simple yes/no answers. When entered into PSMS, the value of F_E is calculated automatically. Where PSMS is not available, the user should apply the calculations provided. Form A4 is the field data collection form. The questions and their order replicate those of Form A3, so it is a simple task to use the field data to calculate F_E .

BOX A1 Calculating F_p

Steps

For each pesticide encountered in a store, a score S_p is calculated. $S_p = (3S_T + S_C) \times Q$, where $(3S_T + S_C)$ is a risk coefficient dependent on the toxicity of the pesticide and the conditions of the containers in which it is stored. Q is the quantity of the pesticide in the store, and is measured in kilograms irrespective of the physical state of the pesticide (liquid or solid). For the purposes of the calculation, it is assumed that all pesticides have a specific density of 1. For a more detailed explanation of the derivation of this calculation please refer to the FAO Obsolete Pesticide Programme in Rome.

S_T is a toxicity score that depends on the WHO toxicity class of the pesticide: S_T is 1 for class U pesticides; 2 for class III pesticides; 4 for class II pesticides; 8 for class Ib pesticides; and 16 for class Ia pesticides.

S_C reflects the condition of the containers: S_C is 1 if none of the containers are damaged; 8 if fewer than 50 percent of them are damaged; and 16 if more than 50 percent are damaged.

The risk factor F_p is the sum of all the S_p scores. In theory, F_p can reach any value because it depends on the quantity of pesticides stored.

Why use values of 1, 2, 4, 8 and 16 for the toxicity score (S_T) and container condition (S_C)?

In field trials a variety of progressions were used, but it was found that a geometric series with a rate of 2 ($2^0 = 1$, $2^1 = 2$, $2^2 = 4$, $2^3 = 8$ and $2^4 = 16$) provides the necessary weighting factor for the toxicity and container condition values and identifies the worst conditions in stores with the most hazardous pesticides and the poorest containers.

Why is a factor of 3 used for the risk coefficient calculation ($3S_T + S_C$)?

S_T is multiplied by a factor of 3 because the toxicity class is considered three times as important as the condition of the containers. This weighting of toxicity was also subject to a series of trials in the field, and the FAO expert team considered that applying a weighting factor of 3 to real-life situations provides the best approximation to actual conditions. The following examples correspond to the scores that would be given to a 1 kg stock of pesticide. When no weighting factor is applied (Table 1), a seriously damaged container of class U pesticide has a higher risk coefficient than a slightly damaged container of class 1b pesticide. When a weighting factor of 2 is applied (Table 2), a similar situation arises. The team concluded that the example in Table 3, with a weighting factor of 3, reflects more accurately the real risk posed by stocks in the field.

		Condition of container		
		No damage	Minor or moderate damage	Serious damage
1		1	8	16
Ia	16	17	24	32
Ib	8	9	16	24
II	4	5	12	20
III	2	3	10	18
U	1	2	9	17

		Condition of container		
		No damage	Minor or moderate damage	Serious damage
2		1	8	16
Ia	32	33	40	48
Ib	16	17	24	32
II	8	9	16	24
III	4	5	12	20
U	2	3	10	18

		Condition of container		
		No damage	Minor or moderate damage	Serious damage
3		1	8	16
Ia	48	49	56	64
Ib	24	25	32	40
II	12	13	20	28
III	6	7	14	22
U	3	4	11	19

FORM A1
Collection of general information on the store (PSMS view)

1. SITE INFORMATION				Site information	
Country		Site name		Number of stores	
Site location				Reported by...	
Address				Reported by	
Phone	Nearest fax	Name of nearest settlement to site	its distance from site (kms)	on date	
Services					
Electricity supply (in store and at site)		Working hours			
Lighting (in store)		Loading facilities and equipment (please mark on the siteplan) <input type="checkbox"/> Forklift/truck <input type="checkbox"/> Ramp <input type="checkbox"/> Drum barrow <input type="checkbox"/> Other (specify)			
Water supply (in store and at site)		Storage available for equipment, empty drums, tools			
		Covered (m ²)		Open (m ²)	
Washing and toilet facilities on site		Comments			
Cellphone networks and signal strength					
Owner		Contact person		Key holder	
Name		Name		Name	
Address		Address		Address	
Phone		Phone		Phone	
Cellphone		Cellphone		Cellphone	
Fax		Fax		Fax	
E-mail		E-mail		E-mail	
Distance to site (km)		Distance to site (km)		Distance to site (km)	
Nearest Ambulance		Nearest Fire Service		Nearest Police	
Town		Town		Town	
Phone		Phone		Phone	
Distance to site (km)		Distance to site (km)		Distance to site (km)	

Please continue with the risk analysis questions 1 to 6 at the back of this form

continues

FORM A1 cont.

Collection of general information on the store (PSMS view)

2. SITE PLAN	Site plan	
Access road from main road to site		
Road surface and features	Distance from main road (km)	Max vehicle weight (tonnes)
	Max vehicle width (m)	Max vehicle height (m)
Road condition	Seasons when road is impassible (months and reasons)	
Site gate		
Gate to site width (m)	Gate to site height (m)	Layout of buildings and store, location of storage for equipment, location of loading facilities and equipment, fences, gates, roads, direction to water sources and towns
Photos		
1. Photo of gate	File name	Description
2. Photo of general view 1	File name	Description
3. Photo of general view 2	File name	Description
4. Photo of covered storage / other services	File name	Description
5. Photo of loading facilities / other services	File name	Description

continues

FORM A1 cont.

Collection of general information on the store (PSMS view)

Store Plan			3. STORE PLAN																		
Site name	Store name																				
<div style="border: 1px solid #ccc; padding: 5px;"> <p style="margin: 0;">Store dimensions</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 2px;">Store length (m)</td> <td style="width: 50%; padding: 2px;">Store width (m)</td> </tr> <tr> <td style="padding: 2px;">Door height (m)</td> <td style="padding: 2px;">Door width (m)</td> </tr> </table> </div>		Store length (m)	Store width (m)	Door height (m)	Door width (m)	<div style="border: 1px solid #ccc; padding: 5px;"> <p style="margin: 0;">STEPS</p> <ol style="list-style-type: none"> 1. Draw exterior of the store 2. Make photos of exterior 3. Repeat 1 and 2 for each store on the site 4. Enter Store 5. Complete Store plan with interior and location of materials 6. Make photos of interior 7. Undertake inventory </div>															
Store length (m)	Store width (m)																				
Door height (m)	Door width (m)																				
<div style="border: 1px solid #ccc; padding: 5px;"> <p style="margin: 0;">Store GPS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; padding: 2px;">Latitude</td> <td style="width: 33%; padding: 2px;">Longitude</td> <td style="width: 34%; padding: 2px;">Altitude (m)</td> </tr> <tr> <td style="padding: 2px;">N S</td> <td style="padding: 2px;">E W</td> <td style="padding: 2px;"></td> </tr> </table> </div>				Latitude	Longitude	Altitude (m)	N S	E W													
Latitude	Longitude	Altitude (m)																			
N S	E W																				
<p>Store plan showing walls, windows, doors, heights of the walls and roof, location and nature of damage to walls and roof, internal walls, position of pesticides/materials, and areas of contamination.</p>																					
<p>Add arrow showing direction of north and include a scale for the plan (grid is 1cm squares) Mark on the plan the position where each photo was taken - photo number and an arrow to show direction of camera</p>																					
<p>Photos</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 30%;">File name</th> <th style="width: 40%;">Description</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">1. Photo of entrance</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">2. Photo of walls</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">3. Photo of roof</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">4. Photo showing the general conditions inside the store</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">5. Photo of inside showing position of stocks</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> </tbody> </table>					File name	Description	1. Photo of entrance			2. Photo of walls			3. Photo of roof			4. Photo showing the general conditions inside the store			5. Photo of inside showing position of stocks		
	File name	Description																			
1. Photo of entrance																					
2. Photo of walls																					
3. Photo of roof																					
4. Photo showing the general conditions inside the store																					
5. Photo of inside showing position of stocks																					
<p>Please continue with the risk analysis questions 7 to 9 at the back of this form (modify the answers to questions 1 to 6 if the inspection of the store indicates that the information provided was incorrect) </p>																					

FORM A2

Inventory of pesticides in store and calculation of F_p

Pesticide (formulation)	Quantity Q (kg or litres)	Toxicity		Container		Pesticide score $S_p = (3S_t + S_c) \times Q$
		WHO class (of formulation)	Score (S_t)	Condition	Score (S_c)	
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
Etc.						
F_p (sum of all S_p)						

FORM A3

Questionnaire and calculation of F_E

1		Storage conditions: management procedures		Answer Yes/no	Weighting factor	Score (max. = 4)
=						
1.1	Is a storekeeper assigned to manage the store?		Yes = 0 No = 1	X 1 =		
+						
1.2	Does the storekeeper check pesticide containers at least once a week? <i>If there is no storekeeper, answer No</i>		Yes = 0 No = 1	X 1 =		
+						
1.3	Is/are there any guard(s)?		Yes = 0 No = 1	X 1 =		
+						
1.4	Is/are the guard(s) assigned 24 hours a day?		Yes = 0 No = 1	X 1 =		
+						
2		Storage conditions: safety		Answer Yes/no	Weighting factor	Score (max. = 5)
=						
2.1	Is there any fire safety equipment on the site?		Yes = 0 No = 1	X 1 =		
+						
2.2	Is there a first-aid kit on the site?		Yes = 0 No = 1	X 1 =		
+						
2.3	Is there any means of communication (radio, telephone, etc.)?		Yes = 0 No = 1	X 1 =		
+						
2.4	Is appropriate personal protective equipment available for the storekeeper?		Yes = 0 No = 1	X 1 =		
+						
2.5	Does the storekeeper wear personal protective equipment?		Yes = 0 No = 1	X 1 =		
+						
3		Environmental conditions: hazards affecting the store		Answer Yes/no	Weighting factor	Score (max. = 15)
=						
3.1	Is the store located in a zone prone to natural disasters (flood, earthquake, hurricane, fire, etc.)?		Yes = 1 No = 0	X 10 =		
+						
3.2	Is the store located in close proximity to a chemical factory, flammable material storage or other industrial hazard (less than 1 km)?		Yes = 1 No = 0	X 5 =		

continues

FORM A3 cont.

Questionnaire and calculation of F_E

4		Environmental conditions: human settlements	Answer Yes/no	Weighting factor	Score (max.=20)
=					
4.1	Is the store located in an urban area?		Yes = 1 No = 0	X 5 =	
+					
4.2	Is there any human settlement within 500 m of the store?		Yes = 1 No = 0	X 5 =	
+					
4.3	Is there any public facility within 500 m of the store (hospital, school, etc.)?		Yes = 1 No = 0	X 5 =	
+					
4.4	Does the public complain about pesticide odours around the vicinity of the store?		Yes = 1 No = 0	X 5 =	
+					
5		Environmental conditions: water sources and soil	Answer Yes/no	Weighting factor	Score (max.=20)
=					
5.1	Is the store located within 250 m of a borehole or a well?		Yes = 1 No = 0	X 5 =	
+					
5.2	Is the store located within 500 m of a lake, pond or river?		Yes = 1 No = 0	X 5 =	
+					
5.3	Is the store located upstream or uphill from a borehole, well or surface water?		Yes = 1 No = 0	X 5 =	
+					
5.4	Has soil contamination been reported?		Yes = 1 No = 0	X 5 =	
+					
6		Environmental conditions: agriculture, livestock activities, wildlife and biodiversity	Answer Yes/no	Weighting factor	Score (max.=7)
=					
6.1	Is the store located within 250 m of crops and pastures?		Yes = 1 No = 0	X 3 =	
+					
6.2	Is the store located within 250 m of food and feedstuff storage?		Yes = 1 No = 0	X 3 =	
+					
6.3	Is the store located in a national park or recreational area?		Yes = 1 No = 0	X 1 =	

continues

FORM A3 cont.

Questionnaire and calculation of F_E

7	Store conditions	Answer Yes/no	Weighting factor	Score (max. = 20)
				=
7.1	Is there a roof?	Yes = 0 No = 1	X 4 =	
				+
7.2	Is the roof waterproof? <i>If there is no roof, answer No</i>	Yes = 0 No = 1	X 4 =	
				+
7.3	Are there complete walls?	Yes = 0 No = 1	X 4 =	
				+
7.4	Are the walls solid and impermeable? <i>If there are no walls, answer No</i>	Yes = 0 No = 1	X 4 =	
				+
7.5	Is there a solid and impermeable floor?	Yes = 0 No = 1	X 4 =	
8	Storage conditions: content of the store	Answer Yes/no	Weighting factor	Score (max. = 6)
				=
8.1	Is any equipment stored with the pesticides?	Yes = 1 No = 0	X 1 =	
				+
8.2	Are any foodstuffs stored with the pesticides?	Yes = 1 No = 0	X 1 =	
				+
8.3	Are any fertilizers or seeds stored with the pesticides?	Yes = 1 No = 0	X 1 =	
				+
8.4	Are any veterinary products stored with the pesticides?	Yes = 1 No = 0	X 1 =	
				+
8.5	Are any chemicals (other than pesticides, fertilizers or veterinary products) stored with the pesticides?	Yes = 1 No = 0	X 1 =	
				+
8.6	Are pesticide containers safely stacked on shelves or pallets?	Yes = 0 No = 1	X 1 =	
9	Store conditions: security	Answer Yes/no	Weighting factor	Score (max. = 3)
				=
9.1	Does the store have a door that can be locked?	Yes = 0 No = 1	X 1 =	
				+
9.2	Is there a complete fence around the store?	Yes = 0 No = 1	X 1 =	
				+
9.3	Does the fence have a lockable gate? <i>If there is no fence, answer No</i>	Yes = 0 No = 1	X 1 =	

CALCULATION OF F_E

A	Store conditions (7)	(max. = 4)	
B	Storage conditions (1, 2, 8 and 9)	(max. = 60)	
C	Environmental conditions (3 to 6)	(max. = 36)	
F_E	Total (A + B + C)	(max. = 100)	

BOX A2

The questionnaire Form A3 and calculation of F_E

Form A3 contains 36 questions grouped into nine criteria:

1) management procedures; 2) safety conditions; 3) hazards affecting the store; 4) human settlements; 5) water sources and soil; 6) agriculture, livestock activities, wildlife and biodiversity; 7) store conditions; 8) content conditions; and 9) security conditions.


Each criterion corresponds to a topic that is essential for appraising the conditions inside and outside the store. All questions are Boolean and can accept only yes/no answers. When the answer corresponds to the worst case, the score is incremented by 1. A specific weighting factor is applied to each question, to reflect its proportional importance in the assessment process. The highest weighting factors are applied to questions related to:

- store conditions, because the building is the first barrier for avoiding contamination of the environment by pesticides;

- human settlements, because stores near a human settlement should be considered as high priority;
- water sources, because stores near to or uphill from a water source should be considered as high priority;
- hazards affecting the store, because stores in locations exposed to environmental hazards could be subject to adverse environmental conditions.

These weighting factors have been subject to extensive field trials and were selected on the basis of calculations that best reflect the real situation, as determined by a team of experts. F_E is the sum of all the weighted scores, and can reach a maximum of 100, which corresponds to the worst conditions.

FORM A4
Data entry sheet for environmental risk (PSMS view)

4. RISK ANALYSIS		Risk analysis
		Answer Yes or No
1. Store conditions: management procedures		
1.1	Is there any storekeeper assigned for the management of the store?	
1.2	Does the storekeeper check pesticide containers at least once a week?	
1.3	Is/are there any guard(s)?	
1.4	Is/are the guard(s) assigned 24 hours a day?	
2. Store conditions: safety		
2.1	Is there any fire safety equipment on the site?	
2.2	Is there a first-aid kit on the site?	
2.3	Is there any means of communication (radio, telephone, etc.)?	
2.4	Is appropriate personal protective equipment available for the storekeeper?	
2.5	Does the storekeeper wear personal protective equipment?	
3. Environmental conditions: hazards affecting the store		
3.1	Is the store located in a zone prone to natural disasters (flood, earthquake, hurricane, fire, etc.)?	
3.2	Is the store located in close proximity to a chemical factory, flammable materials storage or other industrial hazard (less than 1km)?	
4. Environmental conditions: human settlements		
4.1	Is the store located in an urban area?	
4.2	Is there any human settlement within 500 metres from the store?	
4.3	Is there any public facility within 500 metres from the store (hospital, school, etc.)?	
4.4	Does the public complain about pesticide odours around the vicinity of the store?	
5. Environmental conditions: water sources and soil		
5.1	Is the store located within 250 metres from a borehole or a well?	
5.2	Is the store located within 500 metres from a lake, a pond or a river?	
5.3	Is the store located up-stream or uphill from a borehole, a well or surface water?	
5.4	Has soil contamination been reported?	
6. Environmental conditions: Agriculture, Livestock Activities, Wildlife and Biodiversity		
6.1	Is the store located within 250 metres from crops and pastures?	
6.2	Is the store located within 250 metres from storage of food and feedstuff?	
6.3	Is the store located in a national park or recreational area?	
 Complete questions 1 to 6 on the supplementary forms for other stores at the site, then return to page 2 for the site plan		
7. Store conditions		
7.1	Is there a roof?	
7.2	Is the roof waterproof?	
7.3	Are there complete walls?	
7.4	Are the walls solid and impermeable?	
7.5	Is there a solid and impermeable floor?	
8. Store conditions: content of the store		
8.1	Is there any equipment stored together with pesticide?	
8.2	Are there any foodstuffs stored together with pesticides?	
8.3	Are there any fertilizers or seeds stored together with pesticides?	
8.4	Are there any veterinary products stored together with pesticides?	
8.5	Are there any chemicals (other than pesticides, fertilizers or veterinary products) stored together with pesticides?	
8.6	Are pesticide containers safely stacked on shelves or pallets?	
9. Store conditions: security		
9.1	Does the store have a door that can be locked?	
9.2	Is there a complete fence around the store?	
9.3	Does the fence have a lockable gate?	

Tool B

Prioritization of stores

By using tool A it is possible to characterize each store with two risk factors, F_p and F_e . For both factors, the higher the value, the higher the risk associated with the pesticide (as represented by F_p) and the environment (as represented by F_e) posed by the store. It is now necessary to rank the stores that have been surveyed in order to:

- take immediate appropriate safeguarding measures, if required;
- prioritize the stores at highest risk;
- make stakeholders aware of the status of obsolete pesticides in the country through development of a national risk factor (NRF).

Tool B helps government agencies and project management teams interpret the data collected by tool A to identify the most dangerous stores. Tool B facilitates analysis of all available data to identify a group of stores that should be considered as critical and that pose the greatest immediate threat to public health and the environment. This tool should complement, rather than replace, direct observations gathered in the field.

Objectives of the tool

The main objective of tool B is to identify clearly the stores that pose a comparatively high level of risk to the general public and the environment. It aims to provide a methodology for recognizing the most critical stores and prioritizing them based on risk. The net result will be the development of a justified work plan based on sequential minimization of the risk posed by obsolete pesticides at the national level.

A simple process must be used to identify the critical stores. It should be remembered that the process detailed in the following is based on a comparative analysis of all the stores in a country. The tool does not provide an absolute scale for the risk factor associated with the pesticides (F_p), because the stocks can theoretically be of any quantity. The tool does provide a means of comparing all the stores in a country or region and allows country teams to divide them into the following broad categories:

- Critical stores are stores with high scores for both F_p and F_e . These stores contain chemicals that belong to the most hazardous WHO classes and/or are stored in large quantities and/or are badly packaged or in packages that are leaking (resulting in a high value for F_p). In addition, the containment offered by stores in this category (to prevent widespread dispersion of the chemicals) is minimal and the dispersion of chemicals from such a store would result in a serious impact for the environment or the general public (a high F_e). These stores must be considered to be of very high priority in any remediation strategy. All stores that plot in this quadrant should be studied and the reasons for their high risk factors clearly defined (large quantity, high toxicity, near water sources, poor storage construction, etc.). This analysis of the reasons for a high risk factor will assist completion of the store's risk assessment during the repackaging phase of the operation, which is not considered in this tool kit.
- Problematic stores are those with a high score for either F_p or F_e . The data relating to these stores should be studied in detail to determine what factors make them a relatively high risk for either F_p or F_e . Based on these factors (the reasons for a high risk factor), the project management team must decide the relative importance of each store. The risk of an

immediate incident at one of these stores may make that store a high priority, requiring it to be addressed as a matter of urgency.

- Lower-priority stores are stores with low scores for F_p and F_E . These stores present less risk for the environment and human health than stores in the other categories. Stores can be considered as lower priority when the impact on public health and/or the environment is low. Typically this is because the stores:
 - contain smaller quantities of less hazardous pesticides that are generally well packed;
 - are located in more favourable environments.

The values of F_p can be plotted on a histogram. This provides a first filter of the information collected and immediately identifies which stores present the most critical situation, based only on the pesticides they contain. This first review of the data also allows the management team to identify stores where closer examination is warranted. For example, during development of the tool kit, a series of stores were found with F_p values that were more than 100 times greater than those of other stores. This was made clear from plotting all the F_p values on a histogram. Closer examination of the inventory data for these stores showed that a large quantity of useable pesticides (more than 200 tonnes) had been incorrectly included in the data used to calculate the F_p value for the store. The removal of the useable pesticides from the data set resulted in a spread of values that fell within a far smaller range. This does not mean that there will never be instances where large quantities of obsolete stocks result in a very large spread of values for F_p . The histogram provides the management team with a simple graphical representation of the data, which allows them to pinpoint extremes in data that need closer examination and verification.

The F_E values can also be plotted on a histogram and used as a second filter to determine the stores presenting the most critical situation regarding environmental conditions. Again, the histogram provides a simple graphical representation highlighting extremes in data that require closer examination.

Extremes in data values should always result in close re-examination of the original data collected from the field and verification of data that are suspected of being inaccurate, to determine what factor/feature caused the high value.

Description of the tool

To facilitate the selection process, the stores are classified following a graphic approach. This section of the tool kit helps project managers to plot the graph, position the stores on the graph, and characterize each store as lower-priority, problematic or critical, based on splitting the graph into four quadrants. An example of applying this tool is provided in Box B3. The tool is divided into three steps:

- identify the most problematic stores, according to the chemicals they contain;
- identify the stores with the worst environmental conditions, irrespective of the type of pesticides they contain;
- synthesize the findings in a single graph that immediately identifies the critical stores.

Guidelines for store ranking and prioritization

STEP1

First filter – rank the stores according to the level of risk associated with the pesticides (see Box B1)

- Calculate the F_p for each store, as indicated in tool A. (Note that for a location with more than one store, each store must have a separate entry.)
- Complete a first ranking of the stores, based on the F_p values.
- Arrange the stores on a histogram in decreasing order.

- Include the cumulative totals for locations with more than one store and indicate these on the histogram so that they can be identified clearly as composite values.
- Identify and verify the stores presenting a very high F_p score.

STEP 2

Second filter – rank the stores according to the level of risk associated with environmental conditions

- Calculate the F_E for each store, as indicated in tool A. (Note that for a location with more than one store, each store must have a separate entry.)
- Complete a first ranking of the stores, based on the F_E values.
- Arrange the stores on a histogram in decreasing order.
- Identify the stores presenting a very high F_E score and analyse the risk factors.

STEP 3

Determine the critical, problematic and lower-priority stores (see Boxes B2 and B3, use Form B1)

- Calculate a modified F_p^* risk factor for each store (Box B2).
- Set up a graph (Form B1). For each store:
 - plot F_p^* on the Y axis;
 - plot F_E on the X axis.
- Draw one vertical and one horizontal line on the graph, for $F_E = 50$ and $F_p^* = 50$, respectively (Box B2).
- Classify the stores according to the quadrant of the graph in which they plot (Form B1). The closer a store plots to the top righthand corner of the graph, the greater the risk and the higher the priority.
- For locations with more than one store, it is necessary to plot the store-specific data for each location.

Calculation and plotting of these various factors has been automated in PSMS, but it is important that users of the system understand the basis on which these calculations and plots are made.

BOX B1 Inventory verification

F_p scores can be displayed and ranked on a bar graph in increasing order (see the first histogram in Box B3). The stores presenting the highest F_p scores and corresponding to the worst-case scenario can be identified easily because they correspond to the largest bars. As these will be considered first-priority stores, it is recommended that they be rigorously screened in order to understand the reason(s) for their high F_p scores. This verification allows the user to find any errors in the inventory and to avoid possible mistakes in the data analysis process.

BOX B2 Calculating F_p^*

For each store, F_p has been calculated using tool A: F_p is the sum of all the scores S_p , where $S_p = (3S_T + S_C) \times Q$ (Box A1). In theory, F_p can reach any value because it depends on the quantities of pesticides stored. However, it is more practical to frame the value of the risk factor from 0 to 100. This can be done easily by attributing to the highest F_p score, $\max.[F_p]$, a value of 100 and recalculating F_p for all the other stores in the data set to give values of F_p^* as follows: $F_p^* = (F_p / \max.[F_p]) \times 100$.

BOX B3

Example of store classification according to priority group

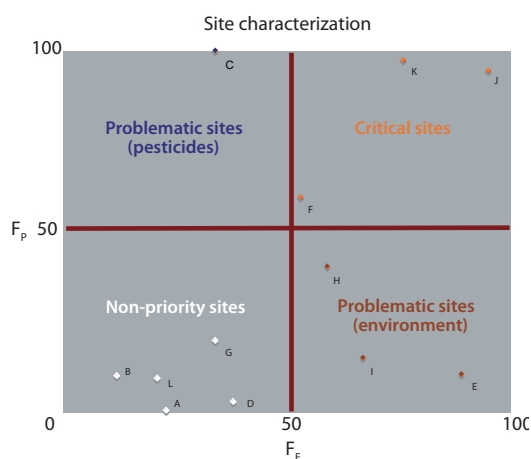
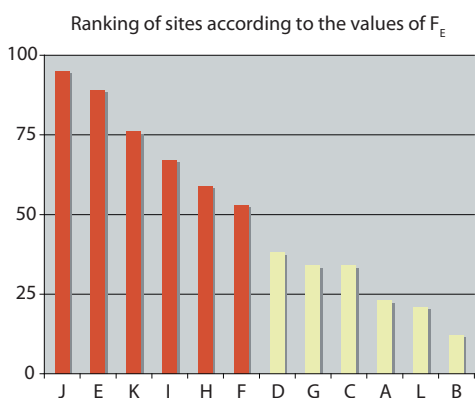
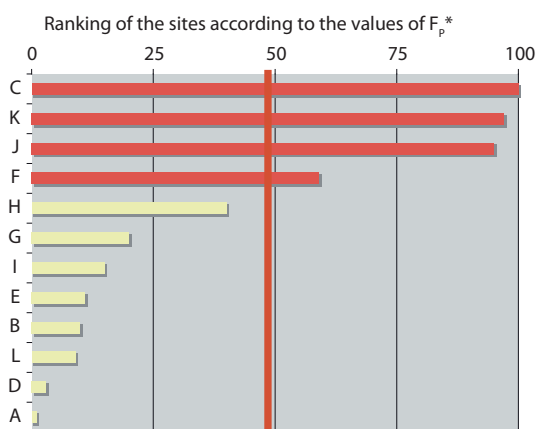
Twelve stores (A, B, C, D, E, F, G, H, I, J, K and L) have been inventoried, and an environmental and public health assessment has been carried out. F_p and F_e have been calculated using tool A. The results are presented in the following table.

- The stores for which $F_p^* > 50$ should be considered problematic owing to the pesticides they contain: high toxicity pesticides, damaged containers and/or large quantities of pesticides. These correspond to stores C, K, J and F. The

inventory of these stores should be carefully checked, as described in Box B1.

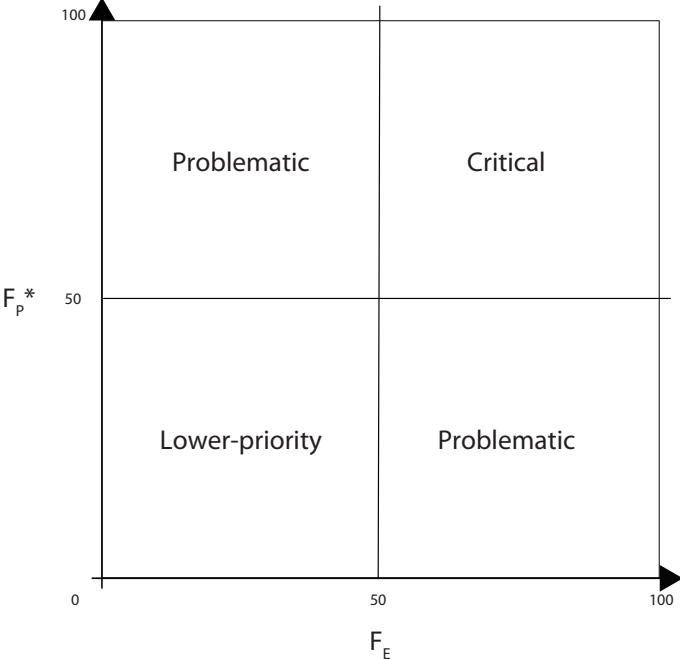
- The stores for which $F_e > 50$ should also be considered problematic owing to the conditions of the store, packaging and/or the environment. In this example, these correspond to stores J, E, K, I, H and F.
- All the stores for which $F_p^* > 50$ and $F_e > 50$ should be considered critical. These correspond to stores J, K and F.

Initial data			Ranking (F_e)			Ranking (F_p)			Calculating (F_p^*)			(X;Y) coordinates		
Site	F_p	F_e	Site	F_p	F_e	Site	F_p	F_e	Site	F_p^*	F_e	Sites	F_p^*	F_e
A	90	23	J	16 503	95	C	17 455	34	C	100	34	L	9	21
B	1 767	12	E	1 848	89	K	17 003	76	K	97	76	K	97	76
C	17 455	34	K	17 003	76	J	16 503	95	J	95	95	J	95	95
D	508	38	I	2 645	67	F	10 385	53	F	59	53	I	15	67
E	1 848	89	H	7 042	59	H	7 042	59	H	40	59	H	40	59
F	10 385	53	F	10 385	53	G	3 463	34	G	20	34	G	20	34
G	3 463	34	D	508	38	I	2 645	67	I	15	67	F	59	53
H	7 042	59	G	3 463	34	E	1 848	89	E	11	89	E	11	89
I	2 645	67	C	17 455	34	B	1 767	12	B	10	12	D	3	38
J	16 503	95	A	90	23	L	1 646	21	L	9	21	C	100	34
K	17 003	76	L	1 646	21	D	508	38	D	3	38	B	10	12
L	1 646	21	B	1 767	12	A	90	23	A	1	23	A	1	23



FORM B1

Store prioritization based on a graphic approach



Tool C

Regional prioritization and risk tracking

Using tool B made it possible to characterize stores and determine their priority levels. Once the priority stores have been identified, it is recommended that safeguarding measures be applied to them first. These stores may be scattered over a vast geographic territory, however, and limited capacity of project management teams and funding constraints sometimes make it impossible to deal with them in isolation. In general, project management teams should prioritize high-risk locations and, if possible, generate a work plan and a remediation strategy based on addressing the problems posed by these stores as soon as possible; when the seriousness of the situation poses a direct threat to public health or the environment, these locations should be dealt with in advance of the main clean-up operation. Where funding is limited and a project has sufficient resources to deal with only a proportion of the affected stores, high-risk stores must be dealt with as a top priority.

Project management teams must therefore decide whether to deal with high-risk stores as an initial exercise or as part of the national clean-up plan. If the stores are to be included in the national clean-up plan, a work plan must be developed, based on the risk that each store poses at a more strategic level than that of the store itself.

In instances where high-risk stores are not dealt with as a priority, a composite risk factor for stores must be generated, based on geopolitical boundaries. As a first step, the project management team needs to define these geopolitical boundaries. The risk factors for each store in a region/province/zone must then be summed and the composite F_p and F_e values plotted.

When high-risk sites are prioritized and dealt with in an initial safeguarding exercise, it is advisable to review the remaining stores and group them according to their geopolitical features. Removing risk at the worst affected stores reduces the overall risk posed by obsolete pesticides at the national level; the project should then be refocused by repeating the plotting process for the remaining affected stores, based on their geopolitical locations and excluding data from the stores that have already been dealt with. A new composite risk factor for each province, region, zone, etc. defined by the project management team will also need to be calculated.

For environmental management plans to be executed effectively, it is necessary to establish a phased strategy, commencing with either high-risk priority stores or “hot-spot” regions where the total environmental and public health priorities are highest. Operations can be expanded to lower-priority regions as time and resources allow. The criteria used to select priority regions must be as objective as possible and must be clearly understood by all stakeholders. Political pressure and logistical issues cannot be key driving forces for starting operations; instead, all decisions should be based on risk analysis and the adoption of a risk reduction strategy.

It is therefore necessary to provide government agencies and project management teams with a method that helps them identify, classify and select the regions and stores for priority attention. Project teams should be capable of tracking reductions in the level of risk each time a store is cleaned up, so as to justify the implementation strategy in terms that all stakeholders can understand, without relying on long technical explanations.

Objectives of the tool

This tool aims to support government agencies and project management teams in establishing a national environmental management plan for the safe removal of obsolete pesticides. It allows project teams to:

- select stores according to environmental and public health priorities;
- identify geopolitical/geographic regions where environmental and public health risks are at the highest levels;
- base implementation strategies on risk reduction;
- keep track of risk reductions achieved at the national and regional/provincial levels as affected stores are cleaned up.

Description of the tool

The process for calculating F_p and F_E for all stores has already been described in tools A and B. Based on these two factors, it is recommended that the regional/provincial risk factors RF_p^* and RF_E^* be calculated for each geopolitical zone in the country. These risk factors measure the cumulative environmental and public health risks associated with all the stores located inside a geopolitical region. RF_p^* and RF_E^* can both be normalized so that a maximum value of 100 is possible for each, corresponding to the worst-case scenario. The following principles from tool B are applied:

- The higher the environmental and public health risk, the higher the regional factors RF_p^* and RF_E^* .
- The situation prevailing in a region can be characterized as lower-priority, problematic or critical.
- The two factors RF_p^* and RF_E^* can be plotted on an X:Y graph to identify the region presenting the worst cumulative environmental and public health risk.

There has been some debate on the validity of summing the F_p and F_E data as opposed to using an average value for each region, but it has been decided to use the sum totals rather than the averages because this approach allows a more accurate comparative analysis of regions. It should be remembered that the extremes of the data set are already accounted for in tools A and B; tool C aims to provide a comparative analysis at the strategic level. Tool kit users are, however, advised to provide a short narrative outlining the factors that make a region plot in a particular area of the graph. The narrative should explain whether high values are the result of many low-risk stores or a few high-risk stores.

Tool C also provides guidance on tracking global risk reduction at the national level by establishing national risk factors NRF_p and NRF_E . As the repackaging, transportation and disposal plan is completed, the F_p and F_E values for cleaned up stores will disappear from the cumulative totals. The values of NRF_p and NRF_E will therefore decline as stockpiles of pesticides are repackaged, centralized at collection points and ultimately removed by environmentally sound disposal.

NRFs offer a simple method of monitoring the progress of a disposal project. Both indices can be considered as key performance indicators of the disposal project. Because the worst affected stores are treated as a priority, there will be a sharp reduction in both NRFs early on in a project. This will be followed by a slower reduction in the cumulative totals as less critical stores are addressed during project implementation. Plotting NRF_p and NRF_E against time will provide a simple and easily understood graphical representation of the reduced potential environmental impact resulting from completion of the disposal operation.

Guidelines for prioritizing geographic regions and selecting stores

STEP 1

Define the regions

- On a map, plot all the stores surveyed during the inventory campaign. (This is a feature of the FAO PSMS.)
- Group the stores into relevant geopolitical regions based on readily available data for the country.

STEP 2

Rank the regions (see Box C1, use Forms C1 and C2)

- Calculate F_p and F_E for each store.
- Make a policy decision on whether to address the high-priority stores identified by tools A and B as an initial exercise or as part of the national project.
- For each region, calculate RF_p and RF_E by summing respectively the F_p and F_E values for all the stores in that region, making any necessary adjustment based on the point above.
- For each region, calculate normalized values for RF_p^* and RF_E^* (Box C1 and Form C1) based on a maximum value of 100 for the highest values of RF_p and RF_E .
- Set up a graph based on Form C2 to determine the highest-risk regions according to their locations on the graph.

STEP 3

Select the stores and track the risk reduction during project implementation (see Boxes C2 and C3, use Form C3)

- Select the stores in the highest-risk region and decide whether to address them as an initial exercise or as part of the national clean-up plan.
- Calculate the NRFs (Box C2).
- Track the NRF values as the project is implemented (Box C2 and Form C3).

BOX C1

Calculating RF_p^* and RF_E^*

RF_p^* is calculated as follows:

- Calculate the region's cumulative risk factor RF_p by adding the risk factors F_p of all the stores in the region. RF_p has an unlimited theoretical value.
- As it is more practical to have a cumulative risk factor ranging from 0 to 100, calculate a modified RF_p^* for each region as follows: $RF_p^* = (RF_p / \max.[RF_p]) \times 100$, where $\max.[RF_p]$ is the value of the region with the highest cumulative risk factor.

RF_E^* is calculated in the same way:

- Calculate the region's cumulative risk factor RF_E by adding the risk factors F_E of all the stores in the region.
- As it is more practical to have a cumulative risk factor ranging from 0 to 100, calculate a modified RF_E^* for each region as follows: $RF_E^* = (RF_E / \max.[RF_E]) \times 100$, where $\max.[RF_E]$ is the value of the region with the highest cumulative risk factor.

BOX C2 Calculating NRF_p and NRF_E

The NRFs are calculated as follows.

NRF_p

- Add the F_p values for all the stores in the country.
- This value is set as 100 percent on the scale for plotting NRF_p against time.
- The F_p value for each store is converted to a percentage of the total NRF_p.
- As stores are addressed during the remediation process, the percentage F_p for each cleaned up store is subtracted from the NRF_p of 100 percent.
- The NRF_p values are plotted against time.
- During the project planning stage, it is possible to forecast the time line for store remediation and to plot a projected graph showing the forecast reductions in NRF_p.
- The project team can then compare the actual time line for the clean-up with the forecast, by comparing the two plots of NRF_p against time.
- The project team should reflect on the reasons for delays in NRF_p reductions compared with the forecast, and should provide justifications for these variances between planned and actual progress.
- Based on a continuous review of progress compared with the plan it is also possible for the project management team at the country level to adjust the project work plan to accommodate any slippage in progress by allocating additional resources (budget, personnel, vehicles, contractors, etc.).

NRF_E

- Follow a similar approach to sum the F_E values for the country and set the total as 100 percent.
- Convert the individual F_E values to percentages of the total NRF_E value.
- The remainder of the process is as for the NRF_p, with the NRF_E value reducing as work proceeds.
- The data can be used as a performance indicator and a management tool to address delays in project implementation compared with the forecast.

FORM C1 Calculation of RF_p and RF_E

Region:		
Sites	F _p	F _E
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
...		
TOTAL		
	RF _p	RF _E
	RF _p *	RF _E *

With : $RF_p^* = RF_p / \max(RF_p[\text{all regions}])$

$RF_E^* = RF_E / \max(RF_E[\text{all regions}])$

BOX C3

Example of classifying regions according to priority level and monitoring project efficiency

Continuing with the example presented in Box B3, it is supposed that the stores A, B, C, D, E, F, G, H, I, J, K and L are spread over four geopolitical regions. A, B and C are in region 1; D and E in region 2; F, G, H and I in region 3; and J, K and L in region 4. Following the indications provided in Box C1, RF_p^* and RF_e^* are calculated as shown in the following table, each reaching a maximum value of 100. Each region is then plotted on an X:Y graph, as previously plotted for each store (Figure C1). In this example:

- regions 4 and 3 can be defined as critical, considering the cumulative risks associated with the public health and environmental situations on the one hand and the chemicals on the other;
- regions 1 and 2 are problematic, depending on the risk considered.

The project management team would probably decide to start implementing the project in regions 4 and 3, continuing with regions 1 and 2.

Once the strategy has been established, the project can be implemented. If all the stores can be cleaned up within four and a half months (18 weeks), the project can be continuously monitored by recalculating the NRFs each time a store is cleaned up.

The NRFs are calculated as indicated in Box C2 (see table opposite) and plotted against time as shown in Figure C2.

Initial data			Calculation of RF_p^*				Calculation of RF_e^*				(X;Y) coordinates		
Site	F_p	F_e	Region	RF_p	RF_p^*	RF_e	RF_e^*	Region	RF_p^*	RF_e^*			
A	90	23	1	19 312	55	69	32	1	55	32			
B	1 767	12											
C	17 455	34											
D	508	38	2	2 356	7	127	60	2	7	60			
E	1 848	89											
F	10 385	53	3	23 535	67	213	100	3	67	100			
G	3 463	34											
H	7 042	59											
I	2 645	67											
J	16 503	95	4	35 152	100	192	90	4	100	90			
K	17 003	76											
L	1 646	21											

Region	Site	Weeks	F_p	RRI
	All sites	0	80 355	100.0%
4	K	3	17 003	78.8%
	J	5	16 503	58.3%
	L	6	1 646	56.3%
3	F	8	10 385	43.3%
	H	9	7 042	34.6%
	G	10	3 463	30.3%
	I	11	2 645	27.0%
1	C	14	17 455	5.2%
	B	15	1 767	3.0%
	A	16	90	2.9%
2	E	17	1 848	0.6%
	D	18	508	0.0%
	Total	18	80 355	100.0%

FIGURE C1

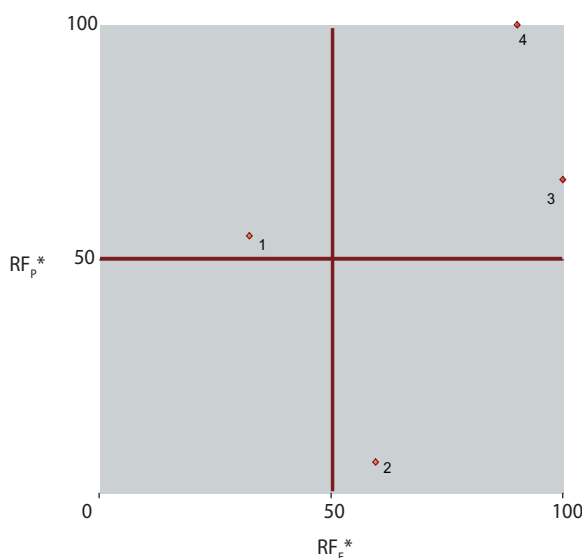
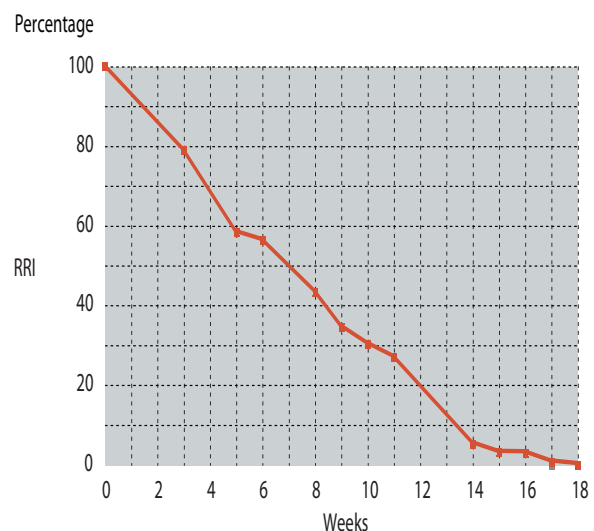
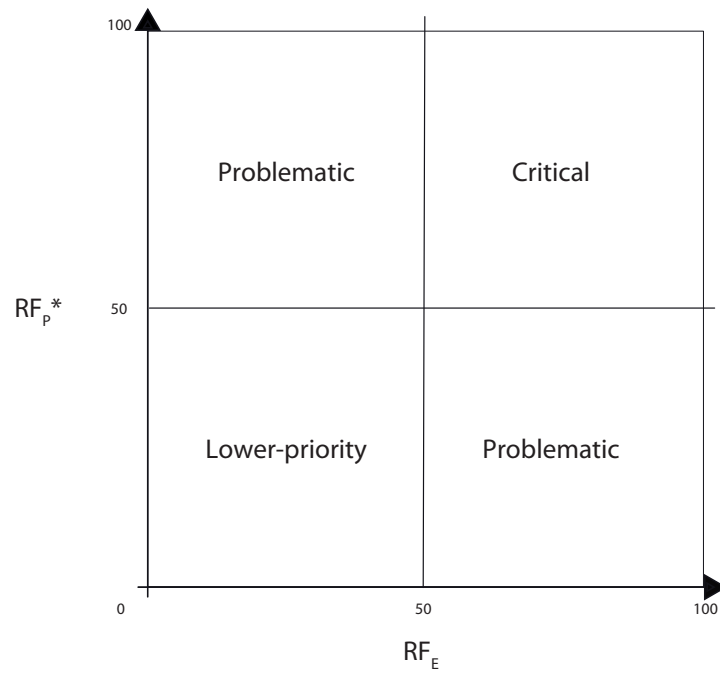


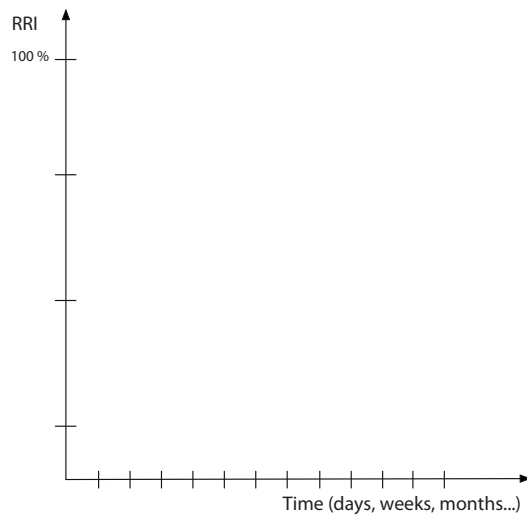
FIGURE C2



FORM C2
Regional prioritization based on a graphic approach



FORM C3
National risk factors



Annexes

Pesticide form

Veterinary product form

Empty container form

Contaminated soil form

Contaminated equipment form

Contaminated material form

Contaminated building material form

PESTICIDE FORM

front side

SITE & WAREHOUSE INFORMATION

1. Site name 2. Warehouse name

LABEL INFORMATION

3. Labels on containers Yes No 4. Labels are legible Yes No

5. Commercial name 8. Formulation type
 EC ULV DP
 Other

6. Manufacturer's name & address

7. Formulator's name & address

9. Active ingredient name A B C








10. AI concentration
 Unit g/l g/kg g/l g/kg g/l g/kg
 % w/v % w/w % w/v % w/w % w/v % w/w

11. Batch No. or Not shown on label

12. Manufacture date dd / mm / yyyy or Not shown on label

13. Expiry date dd / mm / yyyy or Not shown on label

14. UN Chemical Hazards Classification

 1	 1	 1	 1	 1	 1	 1
2	2	2	2	2	2	2

(Circle 1 or 2 to indicate primary and secondary hazards or write the hazards as a comment on the reverse)

Not shown on label

15. How supplied Central Government purchase Donation (indicate donor in comments on reverse) Extension service
 Farmer purchase Unknown Other (specify)

16. Name of supplier

OBSERVATIONS & QUANTITY

17. Condition of product Usable Appears NOT to be usable

18. Physical form Granules Liquid (pumpable) Powder (flowable) Sludge Solidified
 Liquid (separated) Powder (caked)

19. Container type Drum (closed head) Drum (open head) Bag Bottle Jerry can Woven sack
 Other (specify)

20. Container material Aluminum Steel Glass Jute Plastic Other (specify)

21. Container condition Destroyed & contents dispersed Leakage Some damage but no leakage Intact

22. Seal intact Yes No

23. Amount in container Full 75% 50% 25% Empty

24. Container size enter the size of the container as a number of the units in #25

25. Unit of measure Kilogram Litre Other (specify)

26. Quantity (only complete one of 26a or 26b)
 Either 26a When containers are intact and can be counted Number of Containers
 Or 26b When containers are broken and contents dispersed / cannot be counted - estimate the dimensions of the pile
 Length (m) Width (m) Height (m)

PICTURES

27. Picture of label: Filename Description


28. Picture of container: Filename Description

29. Photo of contamination: Filename Description

Question Number and Detailed Comment	Counterpart barcode labels		
	 0 0 0 0 0 1	 0 0 0 0 0 1	 0 0 0 0 0 1

VETERINARY PRODUCT FORM







comment on reverse

	1	Store Name				<input type="checkbox"/>					
	2	Owner (if different from owner of store)				<input type="checkbox"/>					
INFORMATION FROM THE LABEL	3	Labels on Containers	<input type="checkbox"/> Yes	<input type="checkbox"/> No	4	Readable labels	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/>		
	5	Commercial Name				<input type="checkbox"/>					
	6	Active Ingredient name				<input type="checkbox"/> unknown	Sample number if appropriate	<input type="checkbox"/>			
	7	AI Concentration	%			<input type="checkbox"/> W/W	<input type="checkbox"/> W/V	<input type="checkbox"/> V/V	<input type="checkbox"/> unknown	Sample only if > 1 Tonne	<input type="checkbox"/>
	8	Manufacturer's name and address				<input type="checkbox"/>					
	10	Batch number	_____ or <input type="checkbox"/> not shown on label			<input type="checkbox"/>					
	11	Date of Manufacture	dd/mm/yyyy or <input type="checkbox"/> not shown on label			<input type="checkbox"/>					
	12	Expiry Date	dd/mm/yyyy or <input type="checkbox"/> not shown on label			<input type="checkbox"/>					
	13	UN Chemical Hazards Classification (warning diamonds on the containers)	 <input type="checkbox"/> use 1 & 2 to indicate primary and secondary hazards or write the hazards as a comment <input type="checkbox"/> not shown on label			<input type="checkbox"/>					
	14	How supplied / Name of Supplier	<input type="checkbox"/> Central Government purchase <input type="checkbox"/> Extension service <input type="checkbox"/> Farmer purchase <input type="checkbox"/> Donation (indicate donor in comments section) <input type="checkbox"/> Unknown <input type="checkbox"/> Other (specify)			Name of supplier	<input type="checkbox"/>				
	15	Formulation Type	<input type="checkbox"/> injectable <input type="checkbox"/> liquid <input type="checkbox"/> powder <input type="checkbox"/> spray <input type="checkbox"/> pour on <input type="checkbox"/> tablets <input type="checkbox"/> wetable powder <input type="checkbox"/> Other (specify)			<input type="checkbox"/>					
	OBSERVATIONS and QUANTITY	17	Condition of product	<input type="checkbox"/> appears to be usable			<input type="checkbox"/> appears NOT to be usable	<input type="checkbox"/>			
19		Physical form	<input type="checkbox"/> granules <input type="checkbox"/> liquid (pumpable) <input type="checkbox"/> liquid (separated)			<input type="checkbox"/> powder (flowable) <input type="checkbox"/> powder (caked) <input type="checkbox"/> sludge <input type="checkbox"/> solidified	<input type="checkbox"/>				
20		Container type	<input type="checkbox"/> Aerosol <input type="checkbox"/> Bag <input type="checkbox"/> Bottle <input type="checkbox"/> Box			<input type="checkbox"/> combination pack (specify) <input type="checkbox"/> Drum (open head) <input type="checkbox"/> Drum (closed head)	<input type="checkbox"/> FIBC <input type="checkbox"/> IBC <input type="checkbox"/> Jerry can <input type="checkbox"/> Syringe <input type="checkbox"/> Tube <input type="checkbox"/> Vial <input type="checkbox"/> Woven sack <input type="checkbox"/> none	<input type="checkbox"/>			
21		Container material	<input type="checkbox"/> Aluminium <input type="checkbox"/> Cardboard			<input type="checkbox"/> Glass <input type="checkbox"/> Jute <input type="checkbox"/> Plastic <input type="checkbox"/> Paper	<input type="checkbox"/> Steel <input type="checkbox"/> Wood	<input type="checkbox"/>			
22		Have containers been opened	<input type="checkbox"/> Yes			<input type="checkbox"/> No	<input type="checkbox"/>				
23		Container size	enter the size of container as a number of the units in box 24			<input type="checkbox"/>					
24		Unit of Measure of the Container size	<input type="checkbox"/> Cubic Metre <input type="checkbox"/> Cubic centimetre <input type="checkbox"/> Gallon (Imp.) <input type="checkbox"/> Gallon (US)			<input type="checkbox"/> Gram <input type="checkbox"/> Kilogram <input type="checkbox"/> Litre <input type="checkbox"/> Millilitre	<input type="checkbox"/> Piece <input type="checkbox"/> Pint UK <input type="checkbox"/> Pint US <input type="checkbox"/> Pound (lbs)	<input type="checkbox"/>			
25		Amount in container	<input type="checkbox"/> 100% <input type="checkbox"/> 75% <input type="checkbox"/> 50% <input type="checkbox"/> 25% <input type="checkbox"/> 0%			<input type="checkbox"/>					
26		Container Condition	<input type="checkbox"/> Completely broken - contents dispersed <input type="checkbox"/> Leakage			<input type="checkbox"/> Surface damage no leaking <input type="checkbox"/> Undamaged	<input type="checkbox"/>				
27		Quantity (only complete one of 27a or 27b)	Either 27a When containers are intact and can be counted	Number of Containers	Or 27b When containers are broken and contents dispersed / cannot be counted - estimate the dimensions of the pile	Length (m) Width (m) Height (m)	<input type="checkbox"/>				
28	Photo of label	File name	Description		<input type="checkbox"/>						
29	Photo of Containers	File name	Description		<input type="checkbox"/>						
30	Photo of Contamination	File name	Description		<input type="checkbox"/>						

Question Number	Detailed Comment

EMPTY CONTAINER FORM


comment on reverse

	1	Store Name				<input type="checkbox"/>		
	2	Owner (if different from owner of store)				<input type="checkbox"/>		
INFORMATION FROM THE LABEL	3	Labels on Containers	<input type="checkbox"/> Yes	<input type="checkbox"/> No	4 Readable labels	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>		
	5	Commercial Name				<input type="checkbox"/>		
	6	Active Ingredient name			<input type="checkbox"/> unknown	Sample number if appropriate <input type="checkbox"/>		
	7	AI Concentration	%	<input type="checkbox"/> W/W	<input type="checkbox"/> W/V	<input type="checkbox"/> V/V	<input type="checkbox"/> unknown	don't sample if AI is known <input type="checkbox"/>
	8	Manufacturer's name and address				<input type="checkbox"/>		
	9	Formulator's name and address				<input type="checkbox"/>		
	13	UN Chemical Hazards Classification (warning diamonds on the containers)	 <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>			<input type="checkbox"/>		
			use 1 & 2 to indicate primary and secondary hazards or write the hazards as a comment					
			<input type="checkbox"/> not shown on label					
	14	How supplied / Name of Supplier	<input type="checkbox"/> Central Government purchase <input type="checkbox"/> Donation (indicate donor in comments section)	<input type="checkbox"/> Extension service <input type="checkbox"/> Farmer purchase <input type="checkbox"/> Unknown <input type="checkbox"/> Other (specify)	Name of supplier		<input type="checkbox"/>	
OBSERVATIONS and QUANTITY	18	Level of contamination	<input type="checkbox"/> clean <input type="checkbox"/> other (specify) <input type="checkbox"/> residues		<input type="checkbox"/>			
	20	Container type	<input type="checkbox"/> Bag <input type="checkbox"/> Bottle <input type="checkbox"/> Box	<input type="checkbox"/> combination pack (specify) <input type="checkbox"/> Drum (open head) <input type="checkbox"/> Drum (closed head)	<input type="checkbox"/> FIBC <input type="checkbox"/> IBC <input type="checkbox"/> Jerry can	<input type="checkbox"/> Woven sack	<input type="checkbox"/>	
	21	Container material	<input type="checkbox"/> Aluminium <input type="checkbox"/> Cardboard	<input type="checkbox"/> Glass <input type="checkbox"/> Jute	<input type="checkbox"/> Plastic <input type="checkbox"/> Paper	<input type="checkbox"/> Steel <input type="checkbox"/> Wood	<input type="checkbox"/>	
	23	Container size	enter the size of container as a number of the units in box 24				<input type="checkbox"/>	
	24	Unit of Measure of the Container size	<input type="checkbox"/> Cubic Metre <input type="checkbox"/> Gallon (Imp.) <input type="checkbox"/> Gallon (US)	<input type="checkbox"/> Kilogram <input type="checkbox"/> Litre <input type="checkbox"/> Piece	<input type="checkbox"/> Pint UK <input type="checkbox"/> Pint US <input type="checkbox"/> Pound (lbs)	<input type="checkbox"/> other (specify)		<input type="checkbox"/>
	26	Container Condition	<input type="checkbox"/> Completely broken / corroded <input type="checkbox"/> Surface damage <input type="checkbox"/> Undamaged		<input type="checkbox"/> Compacted <input type="checkbox"/> Shredded <input type="checkbox"/> other (specify)		<input type="checkbox"/>	
	27	Quantity (only complete one of 27a or 27b)	Either 27a When containers can be counted	Number of Containers	Or 27b When containers are broken and cannot be counted - estimate the dimensions of the pile	Length (m) Width (m) Height (m)	<input type="checkbox"/>	
28	Photo of label	File name	Description		<input type="checkbox"/>			
29	Photo of Containers	File name	Description		<input type="checkbox"/>			
30	Photo of Contamination	File name	Description		<input type="checkbox"/>			

Question Number	Detailed Comment

CONTAMINATED SOIL FORM

comment on reverse

1	Store Name			<input type="checkbox"/>		
PESTICIDE CONTAMINANT	5	Commercial Name	if the name of the pesticide that contaminated the soil is known		<input type="checkbox"/>	
	6	Active Ingredient name	if the AI of the pesticide that contaminated the soil is known		<input type="checkbox"/>	
	8	Manufacturer's name and address	if the name of the manufacturer of the pesticide that contaminated the soil is known		<input type="checkbox"/>	
	9	Formulator's name and address	if the name of the formulator of the pesticide that contaminated the soil is known		<input type="checkbox"/>	
	13	UN Chemical Hazards Classification (warning diamonds on the containers)	 <input type="checkbox"/> not shown on label use 1 & 2 to indicate primary and secondary hazards or write the hazards as a comment		<input type="checkbox"/>	
	14	How supplied / Name of Supplier	<input type="checkbox"/> Central Government purchase <input type="checkbox"/> Donation (indicate donor in comments section)	<input type="checkbox"/> Extension service <input type="checkbox"/> Farmer purchase <input type="checkbox"/> Unknown <input type="checkbox"/> Other (specify)	Name of supplier	<input type="checkbox"/>
OBSERVATION AND QUANTITY	18	Level of contamination	<input type="checkbox"/> dry stain <input type="checkbox"/> saturated	<input type="checkbox"/> strong odour <input type="checkbox"/> visible contamination	<input type="checkbox"/> weak odour	<input type="checkbox"/>
	19	Type of soil	<input type="checkbox"/> dry clay soil <input type="checkbox"/> dry loam <input type="checkbox"/> dry sandy soil	<input type="checkbox"/> wet clay soil <input type="checkbox"/> wet loam <input type="checkbox"/> wet sandy soil	"Loam" is equal mixtures of sand clay and organic mater, it is typical agricultural soil	<input type="checkbox"/>
	20	How stored or type of container	<input type="checkbox"/> in situ (unexcavated) <input type="checkbox"/> in a pile	or excavated and repacked into:	<input type="checkbox"/> Drum (open head) <input type="checkbox"/> FIBC <input type="checkbox"/> IBC	<input type="checkbox"/>
	21	Container material	<input type="checkbox"/> Aluminium <input type="checkbox"/> Plastic	<input type="checkbox"/> Steel <input type="checkbox"/> Wood		<input type="checkbox"/>
	23	Container size	enter the size of container as a number of the units in box 24			<input type="checkbox"/>
	24	Unit of measure for the Container size	<input type="checkbox"/> Cubic Metre <input type="checkbox"/> Gallon (Imp.) <input type="checkbox"/> Gallon (US)	<input type="checkbox"/> Kilogram <input type="checkbox"/> Litre <input type="checkbox"/> Pound (lbs)	<input type="checkbox"/> other (specify)	<input type="checkbox"/>
	25	Amount in container	<input type="checkbox"/> 100% <input type="checkbox"/> 75% <input type="checkbox"/> 50% <input type="checkbox"/> 25% <input type="checkbox"/> 0%			<input type="checkbox"/>
	26	Container Condition	<input type="checkbox"/> completely broken - contents dispersed <input type="checkbox"/> Leakage			<input type="checkbox"/> Surface damage no leaking <input type="checkbox"/> Undamaged
27	Quantity (only complete one of 27a or 27b)	Either 27a When containers are intact and can be counted	Number of Containers	Or 27b when the soil is in-situ or excavated in a pile - estimate the dimensions	Length (m) Width (m) Height/depth (m)	<input type="checkbox"/>
PHOTOS	28	Photo of label	File name	Description	<input type="checkbox"/>	
	29	Photo of in-situ soil/ pile / containers	File name	Description	<input type="checkbox"/>	
	30	Photo of in-situ soil/ pile / containers	File name	Description	<input type="checkbox"/>	
	31	Photo of Contamination	File name	Description	<input type="checkbox"/>	
	31	Photo of Contamination	File name	Description	<input type="checkbox"/>	
SAMPLES (core samples from hot spots)		sample bottle number	Description, location and depth		<input type="checkbox"/>	
		sample bottle number	Description, location and depth		<input type="checkbox"/>	
		sample bottle number	Description, location and depth		<input type="checkbox"/>	
		sample bottle number	Description, location and depth		<input type="checkbox"/>	
		sample bottle number	Description, location and depth		<input type="checkbox"/>	
		sample bottle number	Description, location and depth		<input type="checkbox"/>	
		sample bottle number	Description, location and depth		<input type="checkbox"/>	
		sample bottle number	Description, location and depth		<input type="checkbox"/>	
		sample bottle number	Description, location and depth		<input type="checkbox"/>	

Question Number	Detailed Comment

CONTAMINATED EQUIPMENT FORM








comment on reverse

	1	Store Name							<input type="checkbox"/>
	2	Owner (if different from owner of store)							<input type="checkbox"/>
PESTICIDE CONTAMINANT	5	Commercial Name	if the name of the pesticide that contaminated the equipment is known						<input type="checkbox"/>
	6	Active Ingredient name	if the AI of the pesticide that contaminated the equipment is known						<input type="checkbox"/>
	8	Manufacturer's name and address	if the name of the manufacturer of the pesticide that contaminated the equipment is known						<input type="checkbox"/>
	9	Formulator's name and address	if the name of the formulator of the pesticide that contaminated the equipment is known						<input type="checkbox"/>
	13	UN Chemical Hazards Classification (warning diamonds on the containers)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> use 1 & 2 to indicate primary and secondary hazards or write the hazards as a comment <input type="checkbox"/> not shown on label						<input type="checkbox"/>
	14	How supplied / Name of Supplier	<input type="checkbox"/> Central Government purchase <input type="checkbox"/> Donation (indicate donor in comments section)	<input type="checkbox"/> Extension service <input type="checkbox"/> Farmer purchase <input type="checkbox"/> Unknown <input type="checkbox"/> Other (specify)	Name of supplier			<input type="checkbox"/>	
OBSERVATIONS and QUANTITY	18	Level of contamination	<input type="checkbox"/> surface <input type="checkbox"/> impregnated		<input type="checkbox"/> saturated <input type="checkbox"/> other (specify)		<input type="checkbox"/>		
	19	Physical form	<input type="checkbox"/> sprayer (portable) <input type="checkbox"/> sprayer (vehicular)		<input type="checkbox"/> Tools <input type="checkbox"/> other (specify)		<input type="checkbox"/>		
	23	Size of equipment	enter the size of the equipment as a number of units in number 24						<input type="checkbox"/>
	24	Unit of Measure of the size of equipment	<input type="checkbox"/> Metre <input type="checkbox"/> Cubic Metre <input type="checkbox"/> Square Metre		<input type="checkbox"/> other (specify)		<input type="checkbox"/>		
	27	Quantity (only complete one of 27a or 27b)	Either 27a When equipment can be counted	Number of pieces of equipment	Or 27b When equipment cannot be counted - estimate the dimensions of the pile	Length (m)		<input type="checkbox"/>	
					Width (m)				
					Height (m)				
	28	Photo of label	File name	Description			<input type="checkbox"/>		
	29	Photo of equipment	File name	Description			<input type="checkbox"/>		
	30	Photo of contamination	File name	Description			<input type="checkbox"/>		

Question Number	Detailed Comment

CONTAMINATED MATERIAL FORM


comment on reverse

PESTICIDE CONTAMINANT	1	Store Name				<input type="checkbox"/>	
	2	Owner (if different from owner of store)				<input type="checkbox"/>	
	3	Labels on Containers	<input type="checkbox"/> Yes <input type="checkbox"/> No	4	Readable labels	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>	
	5	Commercial Name	if the name of the pesticide that contaminated the material is known			<input type="checkbox"/>	
	6	Active Ingredient name	if the AI of the pesticide that contaminated the material is known			<input type="checkbox"/>	
	8	Manufacturer's name and address	if the name of the manufacturer of the pesticide that contaminated the material is known			<input type="checkbox"/>	
	9	Formulator's name and address	if the name of the formulator of the pesticide that contaminated the material is known			<input type="checkbox"/>	
OBSERVATIONS and QUANTITY	13	UN Chemical Hazards Classification (warning diamonds on the containers)	 <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>			<input type="checkbox"/>	
	14	How supplied / Name of Supplier	<input type="checkbox"/> Central Government purchase <input type="checkbox"/> Donation (indicate donor in comments section)	<input type="checkbox"/> Extension service <input type="checkbox"/> Farmer purchase <input type="checkbox"/> Unknown <input type="checkbox"/> Other (specify)	Name of supplier	<input type="checkbox"/>	
	18	Level of contamination	<input type="checkbox"/> surface <input type="checkbox"/> impregnated	<input type="checkbox"/> saturated <input type="checkbox"/> other (specify)			<input type="checkbox"/>
	19	Physical form	<input type="checkbox"/> fertiliser <input type="checkbox"/> seeds	<input type="checkbox"/> other (specify)			<input type="checkbox"/>
	20	Container type	<input type="checkbox"/> Bag <input type="checkbox"/> Bottle <input type="checkbox"/> Box	<input type="checkbox"/> combination pack (specify) <input type="checkbox"/> Drum (open head) <input type="checkbox"/> Drum (closed head)	<input type="checkbox"/> FIBC <input type="checkbox"/> IBC <input type="checkbox"/> Jerry can	<input type="checkbox"/> Woven sack <input type="checkbox"/> none	<input type="checkbox"/>
	21	Container material	<input type="checkbox"/> Aluminium <input type="checkbox"/> Cardboard	<input type="checkbox"/> Glass <input type="checkbox"/> Jute	<input type="checkbox"/> Plastic <input type="checkbox"/> Paper	<input type="checkbox"/> Steel <input type="checkbox"/> Wood	<input type="checkbox"/>
	22	Have containers been opened	<input type="checkbox"/> Yes <input type="checkbox"/> No				<input type="checkbox"/>
	23	Container size	enter the size of container as a number of the units in box 24				<input type="checkbox"/>
	24	Unit of Measure of the Container size	<input type="checkbox"/> Cubic Metre <input type="checkbox"/> Gallon (Imp.) <input type="checkbox"/> Gallon (US)	<input type="checkbox"/> Kilogram <input type="checkbox"/> Litre <input type="checkbox"/> Piece	<input type="checkbox"/> Pint UK <input type="checkbox"/> Pint US <input type="checkbox"/> Pound (lbs)	<input type="checkbox"/> other (specify)	<input type="checkbox"/>
	25	Amount in container	<input type="checkbox"/> 100% <input type="checkbox"/> 75% <input type="checkbox"/> 50% <input type="checkbox"/> 25% <input type="checkbox"/> 0%				<input type="checkbox"/>
	26	Container Condition	<input type="checkbox"/> Completely broken - contents dispersed <input type="checkbox"/> Leakage		<input type="checkbox"/> Surface damage no leaking <input type="checkbox"/> Undamaged		<input type="checkbox"/>
	27	Quantity (only complete one of 27a or 27b)	Either 27a When containers are intact and can be counted	Number of Containers	Or 27b When containers are broken and contents dispersed / cannot be counted - estimate the dimensions of the pile	Length (m) Width (m) Height (m)	<input type="checkbox"/>
	28	Photo of label	File name	Description			<input type="checkbox"/>
	29	Photo of Containers	File name	Description			<input type="checkbox"/>
30	Photo of Contamination	File name	Description			<input type="checkbox"/>	

Question Number	Detailed Comment

CONTAMINATED BUILDING MATERIAL FORM

comment on reverse

	1	Store Name							<input type="checkbox"/>		
	2	Owner (if different from owner of store)							<input type="checkbox"/>		
PESTICIDE CONTAMINANT	5	Commercial Name	if the name of the pesticide that contaminated the material is known						<input type="checkbox"/>		
	6	Active Ingredient name	if the AI of the pesticide that contaminated the material is known						<input type="checkbox"/>		
	8	Manufacturer's name and address	if the name of the manufacturer of the pesticide that contaminated the material is known						<input type="checkbox"/>		
	9	Formulator's name and address	if the name of the formulator of the pesticide that contaminated the material is known						<input type="checkbox"/>		
	13	UN Chemical Hazards Classification (warning diamonds on the containers)	 <input type="checkbox"/> use 1 & 2 to indicate primary and secondary hazards or write the hazards as a comment <input type="checkbox"/> not shown on label						<input type="checkbox"/>		
	14	How supplied / Name of Supplier	<input type="checkbox"/> Central Government purchase <input type="checkbox"/> Donation (indicate donor in comments section)	<input type="checkbox"/> Extension service <input type="checkbox"/> Farmer purchase <input type="checkbox"/> Unknown <input type="checkbox"/> Other (specify)	Name of supplier				<input type="checkbox"/>		
OBSERVATION AND QUANTITY	18	Level of contamination	<input type="checkbox"/> surface <input type="checkbox"/> saturated <input type="checkbox"/> impregnated <input type="checkbox"/> other (specify)						<input type="checkbox"/>		
	19	Physical form	<input type="checkbox"/> asbestos sheets <input type="checkbox"/> concrete <input type="checkbox"/> wood <input type="checkbox"/> brick <input type="checkbox"/> other (specify) <input type="checkbox"/> wattle and daub <input type="checkbox"/> canvas <input type="checkbox"/> steel sheets						<input type="checkbox"/>		
	24	Unit of Measure	<input type="checkbox"/> Metre <input type="checkbox"/> Sheet <input type="checkbox"/> Cubic Metre <input type="checkbox"/> other (specify) <input type="checkbox"/> Square Metre						<input type="checkbox"/>		
	27	Quantity (only complete one of 27a or 27b)	<i>Either 27a</i> When the material can be counted or measured in the units specified in 24	Number of units	<i>Or 27b</i> When material cannot be counted - estimate the dimensions of the pile	Length (m)		Width (m)		Height/depth (m)	
PHOTOS	28	Photo of label	File name	Description						<input type="checkbox"/>	
	29	Photo of building material	File name	Description						<input type="checkbox"/>	
	30	Photo of building material	File name	Description						<input type="checkbox"/>	
	31	Photo of Contamination	File name	Description						<input type="checkbox"/>	
	32	Photo of Contamination	File name	Description						<input type="checkbox"/>	
SAMPLES (if appropriate)		sample bottle number	Description						<input type="checkbox"/>		
		sample bottle number	Description						<input type="checkbox"/>		
		sample bottle number	Description						<input type="checkbox"/>		
		sample bottle number	Description						<input type="checkbox"/>		
		sample bottle number	Description						<input type="checkbox"/>		
		sample bottle number	Description						<input type="checkbox"/>		
		sample bottle number	Description						<input type="checkbox"/>		
		sample bottle number	Description						<input type="checkbox"/>		

Question Number	Detailed Comment

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