Food and Agriculture Organization of the United Nations

World Health Organization

International Code of Conduct on Pesticide Management

Guidance on options for reducing risk when phasing out pesticides

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This publication was developed in the context of the Inter-Organization Programme for the Sound Management of Chemicals (IOMC), which was established in 1995 following recommendations made by the 1992 United Nations Conference on Environment and Development to strengthen cooperation and increase international coordination in the field of chemical safety. The participating organizations are the Food and Agriculture Organization of the United Nations (FAO), the International Labour Organization (ILO), the Organisation for Economic Co-operation and Development (OECD), the United Nations Environment Programme (UNEP), the United Nations Industrial Development Organization (UNIDO), the United Nations Institute for Training and Research (UNITAR), the World Health Organization (WHO), the World Bank, and the United Nations Development Programme (UNDP).The purpose of the IOMC is to promote coordination of the policies and activities pursued by the participating organizations, jointly or separately, to achieve the sound management of chemicals in relation to human health and the environment. The contents do not necessarily reflect the views or stated policies of individual IOMC participating organizations.

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Contents

Tables

Boxes

Foreword

Pesticides continue to play a role in pest and vector management, while also posing potential risks to human health and the environment. Pesticide risk reduction is one of the priority areas in the Food and Agriculture Organization of the United Nations (FAO) pesticide management programme, including addressing risks from the most hazardous products such as highly hazardous pesticides (HHPs). The risk reduction approach sets out steps to review the use, need and risk of certain hazardous pesticides. The identified risks could then be mitigated with appropriate regulatory options that could include a phase-out period and replacement with safer alternatives.

Phasing out pesticides with unmanaged or ineffectively managed risks is essential to achieving the Sustainable Development Goals of the United Nations and meeting obligations related to Multilateral Environmental Agreements. Moreover, the phasing out of pesticides should be supported by a science-based approach to decision-making and best practices. Phasing out a pesticide should be seen in the context not only of human health and environmental impacts and costs, but also in the context of food security, poverty reduction, and reducing climate change impacts. Soundly managing the risks during the period of phasing out a pesticide aids the transition to alternative pest and disease management practices while limiting the harm during this process.

This guidance was prepared with the support of the FAO/WHO Joint Meeting on Pesticide Management (JMPM) to promote the implementation of the provisions of the FAO/WHO *International Code of Conduct on Pesticide Management* (hereafter referred to as the Code of Conduct) that are related to pesticide phase-out.

Preface

This guidance covers different options for banning or phasing out a pesticide and suggests related risk reduction measures to be taken during the phase-out period. A key focus of this guidance is how to take action to manage, prevent, minimize, and communicate about identified risks during the implementation of a phase-out strategy. It contains a description of legal aspects to consider when phasing out a product and illustrates how a risk communication plan can be structured and implemented. How different stakeholders may be involved when a pesticide is going to be phased out is also described. This guidance includes the phase-out of both agricultural and vector control pesticide products that are used in agriculture, for pest control in urban environments, vector control, forestry, food industry, household uses, etc.

The phase-out process covers different stages of the pesticide life cycle. This guidance identifies targeted phases and activities to which phase-out options apply, such as the import, manufacturing, distribution, and use of pesticides. The phases and activities of each potential phase-out option are linked to different considerations for different stakeholders. When the government regulatory authority makes its final regulatory decision, the decision will include the selected option. Some country examples are provided to serve as illustrations of different strategies and their outcomes.

This guidance has been developed according to the recommendations of the FAO/WHO Joint Meeting on Pesticide Management (JMPM) as a priority document to address the lack of guidance on the process for phasing out hazardous pesticides while reducing the risks to populations and areas where they are used for pest control in agriculture and health. It aims to guide countries on managing those risks during the phase-out period of a pesticide registration or ban, particularly for low- and middle-income countries (LMICs), and support them in planning, risk management, transparency, and accountability during the phase-out period. The guidance provides examples of case studies from several countries on best practices, promoting a rights-based approach to pesticide management.

This guidance has benefited greatly from the expert advice of the JMPM, which was established in 2007 to provide technical advice to both FAO and WHO and support development of necessary guidance. An initial draft of the document was prepared by a JMPM working group, which was then reviewed and finalized by the larger JMPM group. The Declarations of Interest received from expert members of the JMPM were assessed by the technical unit (NTD/VVE) according to standard WHO procedures. Other external contributors/observer participants (United Nations Environment Programme [UNEP], Organisation for Economic Co-operation and Development [OECD], international NGOs, and pesticide industry associations) were invited to provide technical comments on the draft document during the peer review process and their participation was limited to the Open sessions of the meeting. The document was finalized in a Closed session of JMPM in which participation was limited to invited experts and FAO/WHO staff, and wherein comments made by the external participants were considered on merit.

This guidance is intended primarily for stakeholders in low- and middle-income countries (LMICs) with inadequate legislation, compliance, and enforcement, as well as limited resources. It is intended primarily for government authorities in charge of pesticide regulation and management but may also be useful for entities such as the pesticide industry, non-governmental organizations, service providers and consultants in the field involved in organizing or advising on pesticide use. Additional stakeholders likely to be interested in this guidance are other government agencies, environmentalists, and academia.

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Declarations of interest

FAO and WHO reported that they had received and reviewed declarations of interest from all FAO and WHO expert panel members who participated in the 17th JMPM and had concluded that none could give rise to a potential or reasonably perceived conflict of interest related to the subjects discussed at the meeting.

Abbreviations

a.i.	active ingredient
EPA	Environmental Protection Agency
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
HHP	highly hazardous pesticide
IPM	integrated pest management
IVM	integrated vector management
JMPM	Joint Meeting on Pesticide Management
LMIC	low- and middle-income country
NGO	non-governmental organization
OECD	Organization for Economic Co-operation and Development
PIC	prior informed consent
PMRA	Pest Management Regulatory Agency
RCP	risk communication plan
UN	United Nations
WHO	World Health Organization

Glossary

Banned pesticide is defined as a pesticide for which all registered uses have been prohibited by final regulatory action, to protect human health or the environment. It includes pesticides that have been refused approval for first-time use or have been withdrawn by industry either from the domestic market or from further consideration in the domestic approval process, and where there is clear evidence that such action has been taken to protect human health or the environment.[1]

Cancellation of product registration is a termination of a product registration as authorized or required by legislation governing the supply and/or registration of pesticides in a nation.

Conflict of interest "…occurs when private interests, such as outside relationships or financial assets, interfere or appear to interfere with the interests of the UN [or government authorities]." [2]

Exposure means any contact between a living organism and one or more pesticides.[1]

Hazard means the inherent property of a substance, agent or situation having the potential to cause undesirable consequences (e.g. properties that can cause adverse effects or damage to health, the environment or property).[1]

Pesticides means any substance, or mixture of substances of chemical or biological ingredient intended for repelling, destroying, or controlling any pest, or regulating plant growth.[1]

Phase-out period is a limited time by which a cancellation of a pesticide registration is implemented.

Risk is the probability and severity of an adverse health or environmental effect occurring as a function of a hazard and the likelihood and the extent of exposure to a pesticide.[1]

Risk assessment is a scientifically based process consisting of the following steps: (i) hazard identification, (ii) hazard characterization, (iii) exposure assessment; and (iv) risk characterization.[3]

Risk communication is an interactive exchange of information and opinions throughout the risk analysis process concerning risk, risk-related factors and risk perceptions, among risk assessors, risk managers, consumers, industry, the academic community and other interested parties, including the explanation of risk assessment findings and the basis of risk management decisions.[3]

Risk management is the process, distinct from risk assessment of weighing policy alternatives, in consultation with all interested parties, considering risk assessment and other factors relevant for the health protection of consumers of treated produce and for the promotion of fair-trade practices, and if needed, selecting appropriate prevention and control options.[3]

Withdrawal of a product registration is defined as the act of cancellation of a product registration.

1. Introduction

1.1 Background

When regulators reach the conclusion that a registered pesticide has human or environmental risks that are not acceptable, they might decide to ban all products containing that active ingredient and phase out its use. Other reasons leading to the phase-out of a pesticide may include potential for residues to exceed importing country tolerances in exported treated produce, or a company may no longer be interested in the continuation of a registration and voluntarily withdraw the registration.

Pesticides with high or unacceptable risks may include, for example, HHPs or pesticides with a high number of deaths due to self-poisoning. These pesticides should be considered for an immediate ban when possible, due to the high risks associated with them or the complexity of ensuring risk reduction through the effective application of mitigation measures. Regulators should refer to the FAO/WHO *Guidelines on Highly Hazardous Pesticides* for regulatory actions that can be implemented to help prevent suicide from pesticide exposure and inform on measures for suicide prevention, as well as consider the voluntary targets set by nations in multilateral environmental agreements.[4]

The decision to ban all products containing a particular pesticide may result in a regulator having two choices: immediately banning or introducing a phased approach. A decision to immediately ban or withdraw a pesticide registration or to allow for a period of time to phase out use requires different measures to reduce and also communicate the risks to exposed populations. This guidance will focus on the circumstances of government decisions, but many of the principles can be extended to voluntary actions by companies as well. When designing a phase-out strategy, its potential impact on people exposed to the pesticide to be phased out must be considered in accordance with existing obligations under national and international law.

Current practice in many countries is that regulatory authorities establish a phase-out period during which activities such as manufacturing, import, export, distribution, and use are restricted, limited or allowed during a specific period of time. Depending on the hazards and risks of the pesticides, the phase-out period can be considerable (e.g. a few years) or very short, resulting in an almost immediate ban in the event of prohibitive hazards. In some countries, the length of the phase-out period may also be guided by the national legislative and regulatory framework. In all cases, the length of the phase-out period should take into consideration the country's capacity to manage all the aspects of the phase-out. For example, while a short-term phase-out is very effective in reducing current risks, it may result in a buildup of obsolete stocks that the country needs to control to avoid container deterioration and potential environmental contamination/pollution. A longer-term phase-out might qualify for the utilization of existing supply chain inventories, but it still exposes workers, other end users, and the environment to risks, necessitating risk mitigation measures. The length of the phase-out period is critical as the risks that have triggered the decision to phase out the pesticide still exist and should be managed as a matter of urgency. In the presence of proven alternatives, a rapid phase-out may be warranted, although that is to be coupled with transition support involving farmer or homeowner training and awareness-raising, i.e. to familiarize end users with the alternative solutions.

1.2 Purpose of this guidance

The purpose of this Code of Conduct is to provide guidance on different phase-out options to a country's government authorities and other stakeholders where they have decided to remove (or ban) a

pesticide product from their market, and guide on the development and implementation of a phase-out plan for risk reduction. Therefore, the starting point of the guidance is when the regulatory authority identifies the potential need to remove a pesticide product or active ingredient. This guidance also includes the case of a voluntary pesticide withdrawal by a pesticide registration holder.

The guidance describes different aspects that need to be considered when deciding on a suitable phase-out strategy. It also provides guidance on how to select appropriate strategies for the planning and implementation of risk reduction and risk communication plans. National plans and strategies will largely depend on a country´s legal and regulatory context, the hazard, and risks of the pesticide, as well as on the country's capacities to implement the phase-out elements. Therefore, guidance will also be provided on options to establish or strengthen the regulatory framework needed to support the phase-out process.

1.3 Structure of this guidance

The guidance is structured as follows:

Section 1 provides background information about developing the guidelines, its scope and purpose.

Section 2 provides guidance on what to consider when selecting a suitable strategy for the phasing out of a pesticide product. It describes some of the key aspects that should be fed into the decision-making process, like the outcome of the hazard and risk assessment of the pesticide, the capacity of the government authorities and the input from relevant stakeholder groups (e.g. farmers, government, consumers, the public, workers, and industry).

Section 3 proposes different phase-out options (immediate removal of all steps of the pesticide life cycle or a phased approach) and phase-out timelines for the various steps.

Section 4 presents the legal aspects linked to the phasing out of a pesticide product. It identifies key features of legislation that serve as the basis to reduce and prevent risks during the phase-out of pesticides and aims to provide guidance to legislators and regulators seeking to further develop their country's legal framework in this context.

Section 5 describes how a risk communication plan can be developed and financed.

Section 6 provides guidance on which risk prevention measures should be applied during the phase-out process.

2. Basis for a strategy to ban or cancel a pesticide registration

Before a final regulatory decision is taken to ban a pesticide or cancel its registration, a decision on how this should be done needs to be made. It could be implemented, either with no phase-out or through a phased approach. The decision should be influenced by the legal provisions in the country, hence the importance of up-to-date legislation. The decision should also be underpinned by knowledge relating to the risk that the pesticide product poses to human health and/or the environment, the capacity of the regulatory authority to respond to those risks (and the risks from cancellation of use), and how different stakeholders may be affected by different approaches and economic costs. This should enable a regulatory authority to take a well-informed and scientifically based decision which will be reflected in the selected phase-out option, including associated timelines when relevant.

2.1 The existing legal framework

An important step in designing a general pesticide phase-out strategy (ahead of its application to a specific pesticide) is mapping out a country's available legislation and any potential gaps that could enable or constrain options to reduce and prevent risks to human health, the environment, farmer livelihoods and agricultural production during the phase-out. This requires analysing and understanding the country's current pesticide, chemical, human health and environmental legal standing linked to international obligations, national constitutional provisions, and national (and where applicable, subnational) laws and regulations. Together these represent the "legal framework" in which the authority must operate.

The legal framework determines what powers the competent authority has for taking a national decision to phase out a pesticide, as well as its options for operationalizing and enforcing that decision. It also determines the rights and obligations of the full range of stakeholders connected to the pesticide being phased out. Section 4 provides guidance on possible legal implications that government authorities should be aware of for different phase-out strategies and measures. In many LMICs where pesticide legislation is fragmented and overseen by multiple government departments, this decision might fall under more than one department. Therefore, it is key that all government stakeholders engage on decisions regarding a pesticide being considered for phase-out.

2.2 Risk to human health and the environment

The decision about which option to select for removal of the pesticide product from the market will be determined by the results of a hazard and risk assessment. In addition to data submitted as part of the application dossier, information from other reputable sources (e.g. without a conflict of interest), monitoring data, pesticide poisoning surveillance data, and results from inspections should also be considered. In the case of a registration holder who wants to apply for a voluntary withdrawal, it may not always be clear what the reason behind the request is. Government authorities should therefore use existing hazard and risk assessment data that is globally available to inform and decide on a suitable phase-out strategy.

2.3 Capacity of regulatory authorities

The human and financial capacity of the relevant government authorities will impact the decision on how long the phase-out period might be. The capacity of the regulatory authorities plays an important role in a well-managed and limited risk phase-out period, and in how well other stakeholders will comply with the regulatory decision.

There needs to be sufficient capacity to:

- carry out stakeholder consultations prior to a phase-out period;
- conduct comprehensive awareness-raising activities for all populations who will be exposed (including risk communication measures for low-literate and remote populations);
- recall products in the supply chain;
- promote sound disposal of recalled products;
- establish necessary risk mitigation measures; and
- ensure appropriate monitoring and enforcement capacity.

Further guidance on how to develop a risk communication plan and on how risk prevention measures can be implemented during the phase-out period is found in Section 5 and Section 6.

2.4 Stakeholder involvement

An efficient phase-out strategy is characterized by transparency, predictability, resource efficiency, and feasibility. A multistakeholder consultation will provide the regulatory authority with necessary information on benefits and consequences with different phase-out decisions.

Stakeholders should be consulted during the development of the general phase-out strategy or as part of the consultative process when legislation is being developed, rather than only in the context of an individual decision for a specific product. The following stakeholders and other public or private entities with a legitimate interest should be considered for engagement in the process of developing the phase-out strategy:

- pesticide registration holders;
- pesticide importers, distributors, and retailers;
- local pesticide manufacturers and formulators;
- farmers (smallholders or large commercial farm owners) and farmer or producer associations/unions;
- Other pesticide users (e.g. public health regulators, pest control companies, residential users);
- plant protection services;
- agricultural extension and advisory services;
- poison information centre(s);
- environment authorities if agriculture is the leading entity and agriculture authorities if environment is the leading entity;
- relevant research institutions (both academic and applied);
- relevant non-governmental organizations (NGOs) working in agriculture, rural development, and disease vector control;

- relevant civil society organizations (e.g. consumer organizations and environmental groups);
- national/regional representations of FAO and WHO;
- designated national authorities of relevant multilateral conventions;
- customs officials;
- transport authorities;
- inspectors and other staff from relevant authorities/government departments; and
- hazardous waste managers.

Table 1 points out certain key stakeholders´ responsibilities related to phase-out/immediate banning of pesticides, and provides examples of areas to explore. More general guidance on stakeholder responsibility can be found in the Code of Conduct.

Table 1. Stakeholder engagement before implementation of a phase-out process or immediate ban

Stakeholder	Stakeholder responsibility – examples of different stakeholders´ responsibilities	Stakeholder consultation – examples of topics for regulatory authorities to discuss/provide information about
Industry associations/ Companies/Retailers	• to have knowledge about their pesticide products and hazards and possible risks; • to implement mechanisms for reducing or preventing obsolete pesticide stockpile accumulation (e.g. take back schemes); • to advocate for, and support policy efforts in sound policy frameworks for the phase-out of banned pesticides and the phase-in of alternatives, including non-chemical measures; • to support access to affordable and adequate personal protective equipment for resource-poor farmers during the phase-out period; • to contribute to the establishment of farming practices not reliant on hazardous pesticides; • to train and capacity build farmers and consumers (e.g. provide insets in different languages on how to read the label elements) including on the ecological concepts and principles underpinning integrated pest management (IPM)/integrated vector management (IVM).	• protection goals for human health and the environment linked to the regulating of pesticide use; • already existing provisions on phase-out in the legislation or when developing new provisions on the same; • the aspects to be considered when designing a phase-out strategy; • the procedure for withdrawal of product registration, voluntary restrictions, consequences of introducing certain timelines for phasing out different steps in the life cycle of the pesticide/immediate bans of pesticides without a phased approach; • the requirement for disposal schemes of obsolete pesticides; • the need for safe and sustainable alternatives, and their sound promotion under an IPM/IVM umbrella; • stakeholder responsibility during phase-out related to risk reduction and risk communication, as well as the need for stewardship and training related to the sound management of pesticides; • standardizing training and hazard/risk information provided to exposed populations during the phase-out period.
Research institutions	• to review the health and environmental impacts of pesticides; • to provide scientific support and evaluate potential new pesticides, non-chemical alternatives and their proposed (stand-alone or integrated) use; • to review the safety of older pesticides during the phase-out period to facilitate the implementation of a risk reduction plan; • to conduct research in areas of significance to the development and execution of IPM and IVM, notably on alternatives to HHPs.	• protection goals for human health and the environment linked to the regulating of pesticide use; • the need for the development of cost-effective and sustainable pesticides and their alternatives, while still protecting agricultural resources, people, and (farmer) livelihoods from pests; • possible need for financial support.

Stakeholder	Stakeholder responsibility – examples of different stakeholders´ responsibilities	Stakeholder consultation – examples of topics for regulatory authorities to discuss/provide information about
	• real-world contexts in close association with end users; • to contribute to the design of better farming systems and the development of alternatives when pesticides are phased out from the market; • to compile and validate information on local availability, efficacy, and cost-effectiveness of alternatives.	
Government – central, decentralized, and local levels	• to determine the responsibilities of relevant stakeholders including all the relevant government departments overseeing an aspect of pesticide legislation (e.g. health, agriculture, transport, waste management, pollution, labour), preferably through legislation when required; • to develop protection goals (i.e. criteria for non-acceptable risks) for human health and the environment related to pesticide use; • to fund or find funding for research and the development of risk communication/awareness-raising materials; • to develop policy instruments for risk reducing phasing out of pesticides at all levels of government; • to develop legal provisions related to banning or the phasing out of pesticides and engage with relevant stakeholders during that process; • to provide guidance on the application of the above-mentioned provisions to relevant stakeholders; • to make pesticide decisions with reference to national protection goals, if existing, and according to the legal provisions on banning/phase-out; • to ensure close collaboration and frequent communication between government institutions responsible for health, environment, and agriculture; • to develop and implement a risk communication/risk reduction plan to be applied during the phasing out of pesticides;	• proposals for policy instruments/strategies/legal provisions for risk reducing phasing out of pesticides and the consequences for different sectors; • the need for clear requirements and guidance for different stakeholders (e.g. industry, retailers, inspectors, end users) and problem-solve challenges implementing required procedures; • follow-up and consequences of specific regulatory decisions; • risk-reducing and informed substitution processes; • budgetary consequences; • the need for reviewed research data generated with no conflicts of interest including poisoning cases from poison information centres, health institutions and mortuaries, or wildlife exposure data; • present risk communication plans developed for the phase-out period; • risk communication materials in appropriate languages developed with no conflicts of interest.

Stakeholder	Stakeholder responsibility – examples of different stakeholders´ responsibilities	Stakeholder consultation – examples of topics for regulatory authorities to discuss/provide information about
	• to conduct monitoring, control, and enforcement activities along the different stages of the pesticide life cycle, in border control and market surveillance to enforce the legislation and prosecute cases of non-compliance with regulatory decisions.	
Farmer associations/ unions	• to speak on behalf of the farmers about the consequences for farming, production and economy under the envisioned pesticide phase-out and adoption of proposed alternatives; • to provide/request training for the application of pesticide alternatives including biologicals and risk reducing farming systems; • to support use of safer and sustainable pest and vector control methods integrated as appropriate with agroecological or biodiversity-based measures; • to report back on the use of banned pesticides and other toxic pesticides during transitional phase-out periods within their territory or jurisdiction; • to circulate risk communication information in different languages that do not pose a conflict of interest.	• proposals for policy instruments/strategies/legal provisions for efficient phasing out of pesticides (and phase-in of alternatives) and the consequences for the farmers; • alternative pesticides/farming systems that can replace the pesticides being banned or phased out and possible need for training; • the management of obsolete pesticides to avoid stockpile accumulation; • risk reduction during phase out; • risk communication mechanisms that do not pose a conflict of interest.
Civil society	• to reflect the views, concerns, and challenges of a broad spectrum of communities and groups, such as non-governmental organizations (NGOs), labour unions, Indigenous Peoples, non-profit organizations, and professional organizations related to government; • to disseminate to the general public standardized information that has been made available; • to disseminate to industry and government information about any issues of pesticide concern to the general public; • to contribute to awareness-raising which can drive market demand;	• proposals for policy instruments/strategies/legal provisions for efficient phasing out of pesticides (and phase-in of alternatives, including non-chemical solutions) and the consequences for various groups; • alternative pesticides and/or farming systems that can replace the pesticides being banned or phased out and possible need for training; • communication strategies and the need for awareness-raising for varying populations, educational status and languages; • standardized information on the hazards, risks, and alternatives to the banned/phased-out pesticide(s) that was produced without a conflict of interest;

Stakeholder	Stakeholder responsibility – examples of different stakeholders´ responsibilities	Stakeholder consultation – examples of topics for regulatory authorities to discuss/provide information about
	• to assist in disposal operations of pesticides, when relevant, including monitoring legislated processes.	• supporting compliance with regulatory decisions and the need for risk reduction; • provision of monitoring data for review.

2.5 Costs and benefits

It is important to understand and carefully consider the potential costs and benefits of continued use of pesticides selected for a phase out. The subsections below highlight some cost and benefit issues that should be considered when deciding the phase-out process and how to reduce risks during that period.

2.5.1 Cost for alternatives

Access to alternative products and farming/vector control processes plays an important role in the process of phasing out/banning a pesticide. The higher cost of environmentally friendly alternatives is frequently cited as a barrier to their adoption, with the concern that farmers would be unable to pay for these alternatives and will be deprived of relatively inexpensive pest management options if access to currently used pesticides is limited. Governments should assess how alternatives could be more affordable and attractive as part of the risk reduction planning during a phase-out period.

2.5.2 Disposal of stockpiles and waste costs

A time-restricted continued use of a pesticide legislated for banning may yield the benefits of preventing and reducing stockpiles of obsolete pesticides. This benefit needs to be first compared to the toxicity of the product and the potential damage of short-term consequences (e.g. poisonings, death, kills of aquatic species) and long-term consequences (e.g. cancer) of continued use. Conducting a cost–benefit analysis will help inform the length of a phase-out process.

Disposal of pesticides which prevents reuse and the potential for pollution arising from ineffective disposal or stockpiling is an important component of pesticide management. When pesticides are banned, managing existing stocks may be a problem. The best way to dispose of small amounts of pesticide stock in trade, or on-farm, is in many cases (and depending on the immediacy of risks to users or the environment) its continued use until the product is finished. However, the decision to continue use must occur within a well-structured risk reduction management plan to prevent human exposures and environmental contamination. Carrying on with "business as usual" after a banning decision is made will cause long term problems.

Products that are retained in stock might eventually become obsolete, if kept until their expiry date. At this point it is necessary to ensure sound disposal of the pesticide products. Disposal of obsolete stocks is an expensive undertaking which poses an economic burden on companies, governments and societies and requires access to facilities that can handle the disposal of pesticides in a safe manner.

2.5.3 Health and environmental costs

The negative impacts to human health and the environment are generally what triggers the decision to ban/phase-out a pesticide. Governments need to factor in the costs of these effects when deciding the length of a phase-out period. Long-term pesticide use, when managed ineffectively, can impose significant "hidden" costs to society. These costs include the negative effects on health (e.g. deaths and years of life lost, acute and chronic injuries and health conditions, and strain on the health system); and the negative effects on the environment and on ecosystem services (e.g. loss of beneficial insects, pollinators, natural predators and wildlife, pollution of water sources, poisoned individuals, and clean-up costs of spills in transport and use). These costs, or impacts, while not reflected in the market price of pesticides, are relevant factors in determining the ban or phase-out period, as well as highlighting where risk reduction measures need to be implemented during phase out.

Again, a cost–benefit analysis may be helpful to assess the benefit of allowing for continued use to reduce stockpiles against the cost of short- and long-term health effects, the impact on health services (e.g. treatment and management of poisoning, deaths and injuries), including anticipated public health expenditure, as well as the cost for decontamination of the environment (e.g. spills, accidents, and fish kills).

3. Different options when removing a pesticide

3.1 Selecting an option

Governments should design and implement a strategy for removing pesticides from the market in ways that are most suitable to the country's use conditions and needs. Based on the aspects described in Sections 2.1 to 2.5, the regulatory authorities should establish a strategy that can be applied in a safe and sustainable manner reducing any further, or ongoing, risks to health or the environment.

Once a decision has been made that regulatory action is needed to remove a pesticide, the phase-out process will be guided by the national legislative and regulatory framework. Therefore, it is paramount that countries have included adequate provisions in their legislation to support the removal of a pesticide. The effectiveness and efficiency, benefits, risks, and costs associated with the different options need to be considered (see Section 2), as well as the technical, economic, and social impacts related to the banning, deregistration, or continued use of a product.

Depending on market conditions and problems with pests, adjustments in the phasing-out plans may be needed to minimize risks to human health and the environment, while at the same time considering the viability of transition to alternatives related to possible crop or revenue losses, vector management, or economic outputs. Identification of affordable alternative chemicals or other pest/vector management options for pesticides proposed to be phased out will facilitate an effective and speedy transition. However, access to alternatives and potential for economic damage should not outweigh risks to human health or the environment.

Where a specific need of a pesticide is identified, and efforts to identify alternatives have been exhausted, regulatory authorities should take all necessary precautions and mitigation measures, and apply restrictions to reduce risks to human health and the environment during the continued use of the pesticide. Alternatives could include practices or products, whether chemical, cultural, biological or physical in nature. In some cases, a recall of pesticides may need to be actioned.

Restrictions may consist of allowing use only under certain conditions such as:

- application only by an authorized person (e.g. specifically certified users and/or specific equipment); and
- not allowing use on crops or vectors that could result in high exposure of farmers/operators/farm and health workers and communities.

These restrictions will need to be conveyed to relevant inspectorates and authorized persons to monitor compliance such as plant protection officers, pesticide inspectors, labour inspectors, and health inspectors, etc. Further guidance on different risk prevention measures that can be applied during the phase-out process is described in Section 6.

Recall of a product for disposal may be necessary if the risks of the product cannot be effectively managed or mitigated and has already been supplied to the users and when an immediate withdrawal has been legislated. Regulations need to clearly specify the role and obligations of parties, in particular those involved with the supply and manufacture of the product, in the product recall process.

A well-developed enforcement system, backed by specific regulations, to support the recall process contributes to preventing continued access to unregistered or banned products. The immediate and

swift removal of these items from the market could limit their availability to users and would be an urgent and substantial step in attempting to reduce the negative effects pesticides have on human health, food safety, and the environment.

The removal should be combined with risk communication programmes and mechanisms to inform farmers, farmers unions and associations, health workers, and consumers on viable alternatives and alternative farming/vector control processes (e.g. agroecological farming, non-chemical vector control).

Each country may have its own timeline requirements to notify relevant stakeholders (including stakeholders who have low literacy levels and live in remote areas) about the decision to ban, phase out or withdraw a pesticide. Notification should occur in a timely manner to minimize exposure and ensure transparent information sharing. Different ways to make a notification could include:

- an Official Gazette;
- published in newspapers, or displayed on a webpage;
- clinics, public health or agriculture extension SMS services; and
- formally to:
  - worker and farmer unions/associations;
  - retailers;
  - retailers of pesticides, especially in farming/vector control intensive (and remote) communities;
  - consumer associations/groups;
  - NGOs/civil societies prominent and active in the country in relation to agriculture and public health; and
  - relevant inspectorates (e.g. agriculture, environmental health, labour, environment, and customs).

Although there needs to be some priority in informing different stakeholders, all should receive the same message within a short timeframe, especially where severe health and environmental risks exist. The removal of these products from the market is an important step toward protecting public health, ensuring food safety and reducing negative impacts on the environment. This process relies heavily on the effective communication with various stakeholders and timely implementation of the withdrawal process. Further guidance on how to develop a risk communication plan can be found in Section 5.

3.2 Options for removal of a pesticide

Once the decision has been made, there are different options when removing a pesticide product from the market and several aspects to consider for each option. A national authority must make decisions in accordance with the country´s legal framework and its capacity to implement these decisions (see Section 4). Some countries may already have legal provisions in place while others will have to make decisions on a case-by-case basis and start a process of updating or strengthening their legislation. A removal strategy can include two options: i) an immediate ban with no phase-out period or a very limited period (see Section 3.2.1); or ii) a regulatory decision including a stepwise approach (i.e. phase-out) that involves stopping the manufacturing, import, distribution and use after different time intervals (see Section 3.2.2). The product registrations of identical products, where the same unmanaged risks exist or are likely to exist, should follow the same path and timeframes.

3.2.1 Immediate removal with no phase-out

The removal (or ban) of a pesticide from the market with no phase-out period can be an effective way to prevent exposure of humans and the environment to pesticides that pose an unacceptable risk (e.g. HHPs) and can spur the market's transition to safer alternatives. This would occur where the regulatory authority decides with immediate effect that no import, manufacture or use of a pesticide is permitted, so as to stop risks to human or environmental health, or to address a risk to international trade in treated produce, based on assessment and consultations with stakeholders. See Box 1 for an illustration of an immediate ban and the reasoning for it.

Box 1. National example of phase-out of Endosulfan

New Zealand: Immediate ban for Endosulfan

New Zealand revoked all approvals for Endosulfan on 10 December 2008, with the decision to come into effect as soon as possible (i.e, 28 days after publication of the decision in the Gazette). Its label uses a variety of crops including vegetables, berry fruit and ornamentals. "Off-label uses" include use on citrus, earthworm control on turf at golf courses, bowling clubs, parks, sports grounds, and airports. The New Zealand Environmental Protection Authority (*Te Mana Rauhī Taiao*) identified potentially significant and therefore non-negligible risks to the environment, to human health and safety, to the relationship of Māori with the environment and to society and the community. It found that exposure to Endosulfan is involuntary in many cases and will persist over time. Additionally, it noted that no potentially significant benefits were identified because of the availability of safer alternatives, and that the high risks outweigh any potential benefits. Free collection and disposal were offered by the government for any stocks remaining with users.

Source: Environmental Protection Authority. *New Zealand Decision for Application HRC07003.* Wellington. https://epa.govt.nz/database-search/hsno-application-register/view/HRC07003

3.2.2 A phased approach

A phase-out, also called a phased approach, is an option where continued trade and use of the pesticide is allowed during a limited time to allow for the introduction and promotion of alternatives and to deplete stocks of the products being phased out. This depletion prevents accumulation of stockpiles of ultimately obsolete products but does allow for continued controlled exposure for humans and the environment. These phase-out scenarios include a consideration of suitable timings for a stopping of the production/manufacturing/import/export, distribution and use over a period of time, in a planned series of steps (starting with manufacture/import, then supply and finally use) to allow for a systematic transition.

The different stages of the pesticide life cycle can be phased out in a tiered way and the stopping of these activities should have timeframes that correspond to the resources to manage and monitor this process, as well as the risk associated with the pesticide. The benefits and disadvantages of these timeframes (immediate product removal, medium-term or long-term phase-out) should be considered, especially in relation to the use contexts. Existing stocks of cancelled pesticides should only be allowed to be distributed or sold for a certain period of time after a regulatory action has been taken, taking into account the economic, social, health and environmental costs and benefits of the use of the pesticide (see Section 2). These costs need to be factored-in and addressed in the risk reduction management plan when a phase-out has been selected. An example of product cancellation and phase-out timelines is shown in Box 2.

Box 2. Product cancellations

***Regulatory Directive DIR2018-01 Policy on Cancellations and Amendments Following Re-evaluation and Special Review* – Health Canada Pest Management Regulatory Agency**

Product cancellations may be required due to failure to provide information required for re-evaluation or special review under the Act; or when products do not meet current standards to protect human health and/or the environment. Where risks of concern are not considered imminent and serious, existing stocks of the products are to be phased out following timelines outlined below.

– One (1) year of sale by registrant from the date of re-evaluation or special review decision,

– One (1) year of sale by retailer from the last date of sale by registrant, followed by;

– One (1) year of permitted use from the last date of sale by retailer.

Any remaining product must be appropriately disposed of. The implementation timeline is intended to allow a limited opportunity to exhaust existing stocks at each level of supply chain (at registrant, retail, and user levels), to minimize potential risks associated with disposing of large quantities of existing product, and to transition to suitable alternatives.

The products selected for phase out may be allowed to be manufactured for the next two years and allow one additional year to dispose of the inventory fully, thus making it a three-year process. The implementation date of withdrawal or cancellation may be delayed if no suitable alternatives to the use of the pesticide exist, so long as the human health and environmental risks, as well as value of the product, are considered to be acceptable until the effective date of the withdrawal or cancellation.

The cancellation of a pesticide registration is generally a slow process following a series of notices and hearings. Furthermore, when a pesticide's registration is canceled, the remaining stock of the pesticide may be used for a given time period depending on terms given in the cancellation notice. In contrast, the suspension of a registration of a pesticide is immediate, and use of remaining stocks of the labeled pesticide are terminated immediately.

Existing stocks of the product will be phased out in Canada within three (3) years from a re-evaluation or special review decision date, following a sequential timeline provided to each level of supply chain as described above.

Source: Excerpt from *Regulatory Directive DIR2018-01, Policy on Cancellations and Amendments Following Re-evaluation and Special Review,* Pest Management Regulatory Agency, Canada.

If a pesticide registration holder chooses to apply for voluntary withdrawal of a product, the use(s), further sale, and distribution of that product after the effective date of cancellation must be done so in accordance with the provisions in the cancellation notice or legislation, and any existing stocks that are disposed of in a manner that contradicts the specified conditions will be a violation of country legislation.

An example of a voluntary withdrawal is found in Box 3.

Box 3. Voluntary withdrawal

Voluntary withdrawals/removal of Endosulfan from market in the United States of America

In July 2010, the United States Environmental Protection Agency (EPA) signed a Memorandum of Agreement with the registrants of Endosulfan that resulted in the voluntary cancellation and phase-out of all existing Endosulfan uses in the United States. Terminating uses of Endosulfan addressed its unacceptable risks to agricultural workers and wildlife.

Under the agreement, approved Endosulfan crop uses ended in two years, including over 30 crop uses plus use on ornamental trees, shrubs, and herbaceous plants. Up to 12 other crop uses ended over the following four years. Of these 12, the last 4 Endosulfan uses ended on 31 July 2016. By the end of 2010, each Endosulfan end-use product label was amended to include a table showing the exact dates when it would become unlawful to use the product on the crops included on the label.

Source: United States Environmental Protection Agency. 2010. Endosulfan Phase-out. In: *EPA, Pesticides Registration.* https://archive.epa.gov/pesticides/reregistration/web/html/endosulfan-agreement.html

To aid governments in deciding phase-out options, Table 2 presents considerations and possible areas of attention for different phase-out time periods, as well as highlighting the risks, benefits and management needed. As is mentioned in Section 4 on legal considerations, the length of the phase-out period should be adjusted according to the level of hazard or risk the pesticide may pose to humans and the environment, whereby a shorter (or even immediate) phase-out period can be established for pesticides where phase-out is based on unacceptable risk. This assessment should be conducted by the regulatory authority based on national legislation, national policy, and local conditions of use.

Table 2. Assessment of indicative phase-out time periods

Examples	Withdrawal type	Import, sale and distribution	Storage, disposal and use	Total grace period	Description and issues	Areas of special attention
Registrations/permits are withdrawn for products posing high risk to human health or the environment, or due to efficacy concerns	Immediate	0 months	0 months	0 months	Associated risks are reduced rapidly. Non-efficacious products are removed. May contribute to a quicker movement to safer alternatives.	Access to adequate capacity to implement and enforce the immediate ban is needed (e.g. ability to prevent importation of illegal or counterfeit products). Issues regarding stockpiles of obsolete pesticides may appear for products in stock still in the supply chain. Possible effects on crop yields, costs of produce, and required substitution with alternative products and methods. Adequate availability of alternatives.
Registrations/permits are withdrawn for products posing high risk to human health or the environment or for efficacy reasons but for which an immediate ban is not possible Registrations/permits are withdrawn for commercial reasons where there are no stocks in the supply chain	Phased withdrawal within 18 months	0 months (registration or permit holder) 6 months (others)	12 months	18 months	Minimizes the adverse impacts on human health and the environment over a period of time. More effective when lower risk and cost-effective alternatives are available. Removal of products which are no longer in use or for which the data requirements are not fulfilled.	Access to adequate capacity to implement the phase-out. Associated health or environmental risks may continue for a designated period which may require interim risk mitigation measures. Issues regarding stockpiles of obsolete pesticides may still appear for products with stocks still in the supply chain. Possible increase in sales as farmers may stockpile. The supply chain should be well structured to ensure adequate stock management of the possible different formulations.

Examples	Withdrawal type	Import, sale and distribution	Storage, disposal and use	Total grace period	Description and issues	Areas of special attention
Application dossier does not fulfil the requirements at the time for renewal of the registration					Could be implemented to decrease risk over time such as: • gradual restrictions of the most hazardous formulations; • changes in a.i. concentration levels; and • setting of individual phased withdrawal periods reflecting the severity of concern.	There needs to be capacity to handle approvals of amended pesticide formulations. Possible effects on crop yields, costs of produce, and required substitution with alternative products and methods. May be facilitated by better access to alternatives. May be improved by measures to prevent importation of illegal or counterfeit products. Communication of health and environmental risks during phase-out.
Withdrawal for administrative purposes/voluntary withdrawal where there is no safety concern, initiated by the registration holder	Phased withdrawal within 48 months	24 months	24 months	48 months	Sell-out period required for existing stocks. Withdrawals following issue of a new registration/permit.	Updated registrations/permits are issued reflecting the latest regulatory standard, and there are no safety concerns with the previous registration/permit. New registrations/permits supersede old registrations/permits and there are no concerns with the previous registration/permit, for example change of product name, change of registration/permit holder or marketing company, additional crops included which does not affect the risk assessment, etc.

Source: Adapted from the pesticide withdrawal table: Withdrawal of pesticide product authorisations and permits. In: *Health and Safety Executive (HSE),* United Kingdom of Great Britain and Northern Ireland. https://www.hse.gov.uk/pesticides/assets/docs/withdrawal-table-final.pdf

3.3 Minimizing the negative impact when applying different options

The impact associated with the different phase-out strategies influences the regulatory decisions and needs to consider hazard assessments, outcomes of available risk assessments or other evaluations. The duration of the phase-out period is based on regulatory action, policies on cancellations and amendments following re-evaluation. A two-year phase-out for the use of a product has been quite common, allowing companies to stop manufacturing and import of pesticides during the first year, retailers to sell stocks/inventories during the second year, and allows pesticide users to use their stocks. In many LMICs this has been a standard practice rather than a decision based on the hazards and risks and assessing who is most at risk of continued exposure (e.g. people in psychological distress who may self-poison, immune-suppressed workers, children, and women). An immediate ban with a shorter phase-out period needs to be considered for a pesticide that causes serious adverse effects.

In LMICs, farmers and farm workers face greater exposure to pesticides, as many end users lack adequate knowledge because of a lack of information in local languages and the means to understand/apply this information, which could result in risks to consumers through pesticide residues. This also includes farmers' lack of knowledge of the ecological concepts and principles underpinning IPM.

Even farmers who are aware of the negative impacts of pesticides occasionally are unable to translate such knowledge into their actions. The need for effective communication with end users is essential to minimize the impacts, and to ensure the management of risks intended through the phase-out. For further guidance on risk communication and risk reduction, see Section 5 and Section 6.

4. Legal Considerations

This section identifies key features of legislation that serve as the basis to reduce and prevent risks during the phase-out of one or more pesticides. It aims to provide guidance to a country's legislators and regulators on supporting a legal framework for the withdrawal and phase-out of pesticides and risk reduction strategies.

4.1 The legal framework for phasing out pesticides

Each country's legal framework may provide a different set of available legal responsibilities and powers which can be used to support efforts to phase out a pesticide. Regulators, especially in LMICs, will need to review their current legislation to identify gaps and areas for strengthening.

A supportive and clear legal framework can provide the competent authority and other stakeholders with a suite of tools for reducing or preventing health and environmental risks during the phase-out of a pesticide. Inadequate legal frameworks can constrain available phase-out options and hamper efforts to manage risk, prevent human and environmental health risks and promote production and trade. The FAO/WHO *Guidance on Pesticide Legislation* provides guidance on the elements that should be incorporated into primary legislation on pesticides (e.g. the national pesticide law/act) as the foundations of pesticide legislation.[5] The foundations should flow down to secondary legislation for the phase-out of pesticides, for example by promoting collaboration between the authorities in charge of pesticides, human health, and environmental protection.

This subsection provides guidance for regulators to identify and develop the necessary legal underpinning for the phase-out of pesticides. The section first enumerates some of the international law obligations that directly impact on the phase-out of pesticides, and then identifies key elements and practices that should be taken into consideration when drafting specific implementing legislation with a focus on the phase-out of pesticides.

4.1.1 International legal instruments and global frameworks

There are several international instruments which may impose legal obligations (for signatories) or global recommendations with implications for the design of a strategy to phase out a particular pesticide. These include binding international instruments such as the *Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention)*, the *Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention)*, the *Basel Convention on the Transboundary Movement of Hazardous Wastes and Their Disposal (Basel Convention)*, the International Labour Organisation conventions, and the *Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (Chemical Weapons Convention)*. As an example, the Stockholm Convention includes a list of persistent organic pollutants that States Parties agree to ban and/or restrict in their jurisdictions. Incorporation of this obligation into national legislation would require not only the actual banning and phase-out of such products, but also the development of appropriate procedures to effectively conduct this phase-out.

4.1.2 National legal framework

The development, implementation and enforcement of national legislation addressing the phase-out of pesticides will be influenced by the constitutional structure of the state and the assignment of roles and responsibilities to various authorities at different levels of government (see Box 4).

Box 4. Allocation of responsibilities in Nepal

The *Nepal Constitution (2015)* transformed the country into a federal republic with three levels of government: i) the federation; ii) the provinces; and iii) the local level. It allocates areas of responsibility between the central federal government and the provincial governments. The federal, provincial and the local entities shall enact law, make annual budgets, make necessary decisions, formulate policies and planning, and implement them in regard to the subjects specified in their respective list of powers.

This allocation of responsibilities raises important considerations for the design of any strategy to phase out a pesticide, in particular given that Nepal's latest pesticides legislation provides for the delegation of implementation responsibilities (related to the regulation of the business of sale, distribution, storage, commercial use and spraying of the registered or re-registered pesticides) to the provincial pesticide management committee. According to the *Pesticides Management Act (2019)*, the provisions on granting licenses for these activities, as well as the renewal and revocation of such licenses, shall be determined by provincial law.

Sources: *Nepal Constitution (2015)* and the *Pesticides Management Act (2019),* Nepal.

Under a nations' constitution, provisions relevant for phasing out pesticides may be found in primary legislation (typically enacted by the country's parliamentary body) and secondary legislation (typically published by line ministries under the legal authority granted by primary legislation). At a minimum, primary legislation should grant the competent authority the power to de-register or ban a pesticide at any time, based on new information available on potential hazards or risks associated with the product or to comply with international commitments or with the recommendations of international or regional organizations, and to develop and implement a detailed phase-out strategy (often specified in secondary legislation). Primary and secondary legislation may be deployed in several ways to implement a decision to phase-out a pesticide or group of pesticides. The appropriate approach for a given country's context will depend on that country's legal traditions, political dynamics, context, and history of government agency practice.

4.2 Key elements and good practices

Regardless of how a country structures its legislation to phase out a pesticide or group of pesticides, there are certain legal elements that are important to consider.

4.2.1 Foundational powers

The steps taken to phase out a pesticide will be shaped first and foremost by the scope of available legal power to make the decision to suspend, cancel, or withdraw a pesticide's registration and thereafter prohibit activities related to that pesticide (see example in Box 5). This power needs to be clearly allocated to an identified authority, usually the same authority responsible for registering pesticides. Depending on the country context, this may be framed as broad powers to regulate the overall pesticide sector, or it can be a more detailed legal provision focused on defining an authority's power to withdraw, cancel or restrict the registration of a pesticide.

Box 5. Phase-out powers in Chile, Madagascar and Georgia

Depending on the country context, the power to phase out pesticides may be framed in either general or specific terms. For example, Chile's legal framework in *Decree-Law No. 3557 Establishing Provisions on Agricultural Protection (1980),* assigns broad power to the competent authority to regulate, restrict or prohibit the manufacture, import, export, distribution, sale, possession, and application of pesticides, alongside the power to confiscate or destroy prohibited or unregistered pesticides. In Madagascar, the legal framework of the *Decree No. 2012-900 of October 9, 2012 prohibits the import, distribution, sale, use and production of certain active ingredients of pesticides… (2012)*, specifies the scope of the competent authority's power to withdraw a pesticide's registration following a reassessment of information that shows that the pesticide does not meet the original registration criteria. Similarly, under the *Law on Pesticides and Agrochemicals (1998)* of Georgia, the competent authority is given the specific power to cancel the registration of pesticides that have been shown to have unfavourable effects on humans and the environment.

Sources: *Decree-Law No. 3557 Establishing Provisions on Agricultural Protection (1980)*, Chile; *Decree No. 2012-900 of October 9, 2012 prohibits the import, distribution, sale, use and production of certain active ingredients of pesticides in agriculture and chemical products in the industrial sector within the framework of the application of the Rotterdam Convention and the Stockholm Convention (2012),* Madagascar; and *Law on Pesticides and Agrochemicals (1998),* Georgia.

Alongside these foundational powers, the legal framework should prescribe general principles to guide decisions and strategies to phase out pesticides. These include the principle that environmental objectives, together with health protection and sustainable agricultural production (with its intrinsic objectives of food security, rural development, and livelihoods), should be at the basis of all decision-making processes in pesticide legislation (principle of integration).
Other common guiding principles and approaches include:

- recognizing the need to act to prevent plausible scenarios of harm, even in the absence of scientific certainty of that harm (see Box 6);
- requiring action to prevent potential environmental damage if a specific product is found to be more harmful than the acceptable limit;
- considering all stages of the pesticide life cycle, including disposal and containers management;
- stipulating that those who create or generate pollution should bear the costs of managing and remediating it to prevent damage to human health or the environment;
- stipulating that the competent authority may revisit and withdraw registration of high-risk products; and
- engaging pesticide companies to minimize and address damage to human health and the environment.

Box 6. Canada's application of the precautionary principle

Under Canada's legal framework of the *Pest Control Products Act (2002)*, the competent authority may cancel the registration of a pesticide if it has reasonable grounds to believe that the cancellation or amendment is necessary to deal with a situation that endangers human health or safety or the environment, taking into account the precautionary principle. Under this context, the precautionary principle in Canada means that where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent adverse health impact or environmental degradation.

Source: *Pest Control Products Act (2002)*, Canada.

4.2.2 Timeline and process

The legal framework may set fixed timelines for phase-outs or else prescribe a general process to be followed to determine the timeline for phasing out specific pesticides. The length of the phase-out period should be connected to the level of hazard or risk posed by the pesticide (see Table 2). A short (or even immediate) phase-out period can be established for those pesticides that pose the greatest health and environmental negative effects. When an immediate ban is not established, legislation can be used to provide different phase-out periods for the different stages of the pesticide life cycle: a) the importing of pesticides; b) the manufacturing of pesticides; c) the distribution, sale and storage of pesticides; and d) the continued actual use of the pesticides. When varied phase-out periods are used, legislation can provide that the final ban of the pesticide enters into force either when the overall phase-out period ends, or when existing stocks are exhausted, whichever happens first. Where applicable, criteria for justification of longer phase-out periods should be clearly stated in legislation (see example in Box 7).

4.2.3 Developing alternatives

Ideally, the identification and development of chemical and non-chemical alternatives using a life cycle assessment should take place prior or during the decision-making process to withdraw a pesticide, so that when such a decision is made, viable alternatives are already, or soon to be, available and accessible. As of the background to a phase-out decision, in some cases, the legal framework may contain provisions focused on measures to foster the registration of appropriate alternatives to the pesticide(s) being phased out (see Box 8). The legal framework can contribute to the identification, development of, and access to alternatives by clarifying roles and responsibilities. Developing alternatives is typically the responsibility of researchers, farmers and other end users (e.g. vector control; see Table 1) and ideally is performed through two-way communication and participatory processes. The dissemination and implementation of alternatives involves importers, manufacturers, retailers, extension officers, and civil society.

Box 7. Phase out timelines in Morocco

In Morocco, under *Law No. 18-34 on Plant Protection Products (2021),* once a decision has been made to withdraw a pesticide's registration and marketing licence because of adverse impacts to human health, animal health or the environment, the legal framework requires that the registration holder must immediately withdraw the pesticide from the market and dispose of it at their own expense according to legal requirements on waste management. For cases where withdrawal is based on other reasons, there is a longer timeline, whereby selling and distribution may continue for a period not exceeding 12 months and use may continue for a period not exceeding 24 months, after which the registration holder must withdraw the pesticide from the market and dispose of it at their own expense according to legal requirements on waste management.

Source: *Dahir n° 1-21-67 du 3 hija 1442 (14 juillet 2021) portant promulgation de la loi n° 34-18 relative aux produits phytopharmaceutiques [Law No. 18-34 on Plant Protection Products], 2021*, Morocco.

Box 8. Finding alternatives in Mexico

In Mexico, the legal framework of the *Decree Establishing the Actions to be Carried out by the Dependencies and Entities that make up the Federal Public Administration…(2020)* requires the Administration to gradually replace glyphosate and agrochemicals used in Mexico with sustainable and culturally appropriate alternatives that allow to maintain production and are safe for human health, the country's biodiversity, and the environment. The instrument further holds, that in order to reduce the possible impact of the gradual substitution of the use and import of glyphosate in commercial agriculture, the relevant authorities will promote and implement sustainable and culturally appropriate alternatives to the use of glyphosate, either with other low toxicity agrochemicals, with biological or organic products, with agroecological practices or with intensive use of labour, that are safe for human health, biodiversity and the environment.

Furthermore, the National Council of Science and Technology is tasked with the coordination, articulation, promotion and support of scientific research, technological developments and innovations that allow it to support and propose to the relevant authorities possible alternatives to glyphosate. The relevant authorities may also invite producer organizations, agrochemical industry, user associations, bio- or organic-producer organizations to participate in the design, promotion, and implementation of alternatives.

Source: *Decree Establishing the Actions to be Carried out by the Dependencies and Entities that make up the Federal Public Administration, within the Scope of their Competences, to Gradually Replace the Use, Acquisition, Distribution, Promotion and Import of the Chemical Substance Called Glyphosate and Agrochemicals Used in Our Country that Contain It as an Active Ingredient, for Sustainable and Culturally Appropriate Alternatives, Which Allow to Maintain Production and Are Safe for Human Health, the Biocultural Diversity of the Country and the Environment*, 2020.

4.2.4 Notice requirements

The legal framework should establish minimum requirements to inform stakeholders of a decision to phase out a pesticide. These minimum requirements should specify: i) who must be informed of a decision to phase out a pesticide (registration/licence holders, pesticide shops, farmers and other pesticide users or civil society); ii) by what means (for example, information about a phase-out decision is widely published in the government's official gazette, on a website, in newspapers or by civil society); iii) by whom (for example, the competent authority in charge of phasing out the pesticide); and iv) the content of information to be provided (for example, a minimum requirement that circulated information includes details of the pesticide being phased out, reasons for the decision, the phase-out period, interim measures during the phase-out period, as well as obligations of the different stakeholders involved, and instructions for collection and safe disposal) – see example in Box 9. The legal framework's notice requirements may have a major influence on the risk communication plan for a phase-out, as further discussed in Section 5.

Box 9. Informing stakeholders in Peru, the Gambia, Bangladesh, and Lao People's Democratic Republic

In Peru, according to the *Supreme Decree No. 001-2015-MINAGRI – Regulation of the National Pesticide System for Agricultural Use (2015),* when a decision has been made to withdraw a pesticide's registration, the registration holder is legally obligated to inform users about the decision. Additionally, the competent authority must annually publish online a list of pesticides that have been banned or had their registrations withdrawn.

In the Gambia, under the *Hazardous Chemicals and Pesticides Control and Management Act (1994),* notices of the cancellation of a pesticide's registration must be published in the country's national gazette.

In Bangladesh, the decision to cancel a pesticide's registration must be published in a leading daily newspaper and in the journal of the country's agriculture information service, according to the *Pesticide Rules (1985)*.

.../cont.

In the Lao People's Democratic Republic, the *Decree No. 258/GOV on Pesticide Management (2017)* requires that pesticide business operators are to display the current list of banned pesticides in a prominent location for customers to see.

Source: *Supreme Decree No. 001-2015-MINAGRI – Regulation of the National Pesticide System for Agricultural Use, 2015*, Peru; *Hazardous Chemicals and Pesticides Control and Management Act (1994)*, Gambia; *Pesticide Rules (1985),* Bangladesh; and *Decree No. 258/GOV on Pesticide Management (2017)*, Lao People's Democratic Republic.

4.2.5 Declaration of remaining stocks

The legal framework should place a responsibility on identified stakeholders (such as manufacturers, importers, retailers, health workers, and farmers or other users) to advise the national authority of stocks they are holding for a phased-out, or subsequently cancelled/obsolete pesticide. It is important for such provisions to consider and specify who must report information, what information must be reported (e.g. approximate volumes, locations, health and environmental risks), by what means, and within what timeframe. Once the phase-out period ends, the legal framework can also require a similar declaration to understand whether there are stocks of obsolete pesticides (see example in Box 10). It is important for the competent authority to remain aware of the amount of a phased-out pesticide still in circulation. This information can help competent authorities to target recall activities and prepare to deal with possible obsolete pesticides once the phase-out period ends.

4.2.6 Collection and disposal

The legal framework may assign powers and responsibilities to recall pesticides that are being phased out, to remove them rapidly from circulation, and establish who is to carry the cost of the recall of the pesticide. Phasing out a pesticide may lead to significant stocks of obsolete pesticides if all quantities already in circulation are not successfully recalled or used during the phase-out period. While the general legal rules applicable to the disposal of obsolete chemicals would apply, considering the potentially large amounts of pesticides becoming obsolete, legislation can be used to create specific requirements for the collection and disposal of pesticides, containers, and other associated waste that have become obsolete as a consequence of a phase-out decision.

Box 10. Declaration of remaining stocks in Argentina

In Argentina, *Resolution No. 350-1999-SAGPYA on Plant Health (1999)* prescribes that, once a decision to phase out a pesticide has been published, stakeholders will have a period of thirty days to make a sworn declaration of stocks of the pesticide being phased out, indicating the place of their storage; following this the competent authority will prescribe the term and modality for the liquidation of the declared stock, after which the product may no longer be marketed.

Furthermore, in 2018, when phasing out Dichlorvos and Trichlorfon, Argentina applied *Resolution No. 149-2018 of the National Service of Agricultural Health and Quality (2018)*, whereby firms that had products that were affected by the prohibition were required to declare their stock to the competent authority within thirty calendar days counted from the entry into force of the resolution, detailing the quantity of containers, their capacity, batch and expiration date; the same firms which still had remaining stocks on the date of prohibition of use, had to report such a situation to the competent authority within fifteen calendar days counted from the date of entering into force of the prohibition.

Source: *Resolution No. 350-1999-SAGPYA on Plant Health (1999);* and *Resolution No. 149-2018 of the National Service of Agricultural Health and Quality (2018)*, Argentina.

The legal framework may assign responsibilities, powers and costs to public stakeholders, private stakeholders, or a mix of both, depending on the availability of resources. For example, it is possible for legislation to make this the responsibility of the private sector, especially in resource limited LMICs, and request or require producers or licenced sellers to support the collection of phased-out products (see example in Box 11). In case of imported pesticides, it is possible for legislation to require the importer to export the pesticides to a country where the pesticides are lawful, or where lawful disposal can occur.

It is also possible for legislation to authorize the competent authority to directly collect pesticides from manufacturers and retailers for disposal by the state following the phase-out period. Collection and disposal might be under the mandate of the pesticide authorities or under the responsibility of the ministries in charge of the environment, pollution, or chemicals. Implementing and monitoring-related activities may also involve participation of decentralized and local activities. A framework for coordination might need to be in place that ensures an appropriate flow of information between these and the pesticide authority.

4.2.7 Enforcement

Beyond general inspection, seizure, and enforcement powers and the definition of legal offenses and penalties related to pesticides, the legal framework may provide additional specific enforcement powers or defined offenses specifically focused on pesticide phase-outs. For example, these can include making it a specific legal offence to supply/possess/buy an unregistered pesticide following the phase-out period, so as to create an incentive to either use up or dispose of the pesticides during the phase-out period (see example in Box 12).

Box 11. Collection and disposal in Honduras, Eswatini, and Panama

In Honduras, the *Agreement No. 642/98 - Regulation on the Registration, Use and Control of Pesticides and Related Substances (1998)* provides that the competent authority will establish the necessary measures so that the registrant proceeds to withdraw, re-export or eliminate the product within the defined phase-out period.

Similarly, Eswatini's *Pesticides Management Act (2017)* provides that a pesticide recall order may be subject to such conditions as the competent authority may impose, and any person in possession of recalled pesticides shall report to the Registrar within seven days from the date of publication of the recall order and comply with any instruction which the Registrar may issue.

In Panama, under *Resolution No. DAL-015-ADM - Prohibits the Import, Manufacture, Commercialization and Use of Products Formulated based on the Active Ingredient Carbofuran (2010)*, at the end of the phase-out period, the Ministry of Agricultural Development, in coordination with the Ministry of Health, will collect any "Carbofurán" formulations from warehouses or points of sale and will return them to their country of origin. Costs of this are to be charged to the importing and/or distributing company without exempting them from other penalties.

Source: *Agreement No. 642/98 - Regulation on the Registration, Use and Control of Pesticides and Related Substances (1998)*, Honduras; *Pesticides Management Act (2017)*, Eswatini; and *Resolution No. DAL-015-ADM - Prohibits the Import, Manufacture, Commercialization and Use of Products Formulated based on the Active Ingredient Carbofuran (2010)*, Panama.

Box 12. Phase-out offenses and enforcement powers in Morocco and Lao People's Democratic Republic

As one example, the legal framework of *Law No. 18-34 on Plant Protection Products (2021)* in Morocco, makes it a specific offense to possess a withdrawn pesticide with the purpose of sale, distribution, or use, which is subject to possible imprisonment and monetary fines.

As another example of potentially relevant enforcement provisions, *Decree No. 258/GOV on Pesticide Management (2017)* of the Lao People's Democratic Republic, specifically gives pesticide inspectors the power to seize banned pesticides. Furthermore, pesticide users and pesticide business operators are legally obligated to report observations of unregistered pesticides.

Source: *Law No. 18-34 on Plant Protection Products, 2021*, Morocco; and *Decree No. 258/GOV on Pesticide Management (2017)*, Lao People's Democratic Republic.

4.3 Pathways to regulatory reform

While the legal elements highlighted in the previous subsections are a good starting point when assessing the suitability of a country's legal framework, it is not intended to cover every possible country scenario. There may be additional legal elements which need to be considered in a specific country context, and likewise, not all the legal elements discussed will be relevant in every country context. Accordingly, detailed analysis and consultation with stakeholders (see Table 1) are essential at this stage.

In some cases, a country's existing legal provisions may be perceived by stakeholders to be inadequate to support a desired phase-out strategy. In such cases, it will be necessary to either adjust the chosen phase-out strategy to match currently available legal powers and procedures, or begin initial reform discussions in pursuit of either a change to currently existing primary or secondary legislation, or the development of new legislation.

Regardless of the path chosen, the long-term quality and suitability of the legal framework for phasing out pesticides – and its successful implementation – will depend on the engagement of stakeholders throughout.

5. Risk communication during phase-out

During the phase-out process, pesticide end-users, transporters, disposal operators, consumers and others, may continue to be exposed to pesticides that are being withdrawn. Therefore, it is key that all entities have adequate information on the reasons for and details about the phase-out (as stipulated in Section 4 this should be clearly stated in legislation).

This section presents options for risk communication to various stakeholders (e.g. to end-users, the general public, workers) to reduce exposures and risks during the phase-out period.

Risk communication is an ongoing two-way process during the phase-out period. Risk communication goes beyond just providing information and should be considered as an informed dialogue between affected stakeholders about the pesticide hazards and its associated risks during the phase-out period. Therefore, a communication mechanism with relevant national authorities needs to be established and accessible to remote and low-literate populations (see Box 13).

Information provided to potentially exposed populations must be relevant for the use and country context. There is a need to consider the socio-economic-cultural characteristics of the exposed population so that the messages are more effective in addressing specific needs and the context of diverse exposed populations within a country.

Immediately after a decision has been made as to which phase-out option to implement (Table 2), a risk communication plan (RCP) needs to be developed, consistent with strategic planning of its risk communication activities and the most current knowledge.

5.1 Developing a risk communication plan

Reducing further health and environmental impacts during the phase-out period can be actioned by developing an RCP through the steps listed in Table 3. Table 3 provides questions and issues to address when considering each step for developing an effective RCP during the phase-out period of a pesticide.

Box 13. Purpose of risk communication during phase-out of a pesticide

One purpose of risk communication during the entire phase-out period of a pesticide is to provide those who will be exposed with:

1) Accurate and accessible information about the pesticide's hazards (i.e. in the relevant language and literacy levels);
2) Accurate and accessible information about the pesticides short- and long-term health risks (i.e. in the relevant language and literacy levels); and
3) Detailed and accurate information on risk reduction procedures and the means to implement these.

Source: Author's own elaboration.

Table 3. Preparing a pesticide phase-out risk communication plan

STEPS	QUESTIONS AND ISSUES TO ADDRESS
Step 1: Identify the risk communication plan (RCP) developer	Who will lead in developing the RCP? • Is there a specific government entity/staff member? • Will a risk communication expert consultant be hired? • Will the industry be required to develop a plan? Who will review and approve this plan?
Step 2: Define the RCP goal	What are the reasons for the pesticide being phased out (list the specific health or environmental impacts) that need to be communicated?
Step 3: Identify the target audiences	Who needs to be informed? • How many people are likely to be affected by the risk? • How many children are likely to be affected by the risk? • What are the socio-demographic groups that make up the people who are likely to be affected? • What proportion of the potentially affected population do they make up? • Will the risk have different consequences to the different socio-demographic groups? [6] List: • Who will be exposed and where in the country (including transport, sales outlets, mixing, application and disposal). • First responders to an accident. • Health professionals, poison information centres and clinics.[6]
Step 4: Plan and design risk messages	What messages need to be communicated? • What are the short- and long-term risks? • How can exposure be minimized/prevented? • Which less toxic alternatives could be used?
Step 5: Inform target audiences about the risks	What channels will be used to communicate the risk messages? What is the reach/demographic and accessibility of the channels? Are the channels the same for consumers, farmers, farm workers, retailers, etc? e.g. via: • social media • posters • infographics • community spokes persons • radio/TV • school platforms • through religious leaders/institutions How will policy makers be informed? e.g. via: • policy briefs • Presentations to parliament • Infographics

STEPS	QUESTIONS AND ISSUES TO ADDRESS
Step 6: Consider existing resources and financing the RCP	What resources exist to finance the RCP? What resources can be tapped into to finance the various RC strategies? What entities should finance the RC process?

There are many useful resources to aid in developing the RCP such as the *Guidance Document on Risk Communication for Chemical Risk Management*[7] from the Organisation for Economic Co-operation and Development (OECD); and the *Guidance on Information Requirements and Chemical Safety Assessment*[8] from the European Chemicals Agency (ECHA).

5.2 Implementation of a risk communication plan

Once the RCP has been developed, effective implementation in a timely manner is key. An RCP should be developed so that it is ready for implementation when companies and others are notified that a pesticide will be phased out. This then allows for implementation of the various risk communication mechanisms to coincide with the notification.

However, there is no reason why a national government could not implement an RCP earlier. If a country is in discussion about the risks of a pesticide or aware of its listing on an international convention or if other countries in the region are withdrawing registrations (as potential indicators of rationale for future ban and/or withdrawal), then it would be beneficial to have an RCP in place as soon as possible. The phase-out does not need to be the trigger for an RCP, but the implementation of a phase-out process should be accompanied by an RCP.

5.3 Monitoring the implementation of a risk communication plan

Once an RCP has been implemented, mechanisms should be put in place to evaluate the effectiveness of the various strategies. Monitoring should include:

- pesticide poisoning surveillance data before and after implementation of the plan;
- wildlife exposure and/or pesticidal pollution of soil and water matrices;
- random sampling of exposed populations to evaluate if their behaviours have changed in relation to the RCP;
- use of various mechanisms for evaluation including (farmer) household surveys; and
- Making changes to the strategies that are ineffective.

After an RCP has been put in place for the phase-out of a particular pesticide, and the plan is adjusted from time-to-time to improve its reach and impact, the RCP could develop into an on-going sustainable awareness-raising mechanism.

5.4 Financing risk communication and risk reduction during phase-out

This section addresses finance mechanisms for managing risks linked to the phase-out, as well as risk communication strategies during the phase-out period. Financing should cover all costs associated with the phase-out process including storage, disposal, clean-up, and the implementation of risk communication strategies. The decision to withdraw, ban or phase-out the use of a particular pesticide is a national regulatory decision which may be influenced by regional and international decisions. The

cost incurred by this decision may be financed by the government (e.g. funding the regulation of the pesticide, as well as levies or taxes during its continued use), the industries manufacturing and selling the pesticide, or other entities – see *UNEP Guidance on National Authority for Chemicals Control: Structure and Funding (2019)*[9] from the United Nations Environment Programme; and *Sustainable financing of institutional capacity for chemicals control (2020)*[10] from the Swedish Chemicals Agency (KEMI).

When establishing an integrated approach to financing the management and waste of chemicals in a country, funding the phase-out process should be included. Depending on national legislation and local circumstances, financing costs during the phase-out of a pesticide, such as risk communication, may be a responsibility of industry, in particular the supplier or manufacturer, but may conceivably include other entities (see Box 14).

Box 14. Industry's role in conducting a phase-out programme

Conduct and funding of a phase-out programme

The industry faces several risks that may have financial consequences and therefore an up-to-date risk management strategy needs to be put in place that identifies the risks and has plans to mitigate them. Typically, this risk management profile should be updated every year. There are four types of risk to be considered:

Operational
This involves the day-to-day operation of the company involving buildings, equipment, vehicles, stocks of materials, employees and their activities. Most of these risks can be insured against.

Strategy
Market foresight is needed to understand how the current business strategy may be undermined by the activity of competitors and changes in the market conditions. It is not possible to buy insurance against this, but plans need to be made to avoid this or how to mitigate it and how this will be funded.

Compliance
Foresight is needed for possible changes in the regulations governing the industry and how these might impact operations. Though it is not possible to insure against this, provision should be made for any changes that are foreseeable.

Reputational
How a business is perceived by shareholders, customers, the public, the media, and authorities is important to its successful operation. Except for data security, these risks cannot be insured against but should be understood and actively managed. With respect to the phase-out of products, all four types of risk are impacted. For the most part these risks cannot be insured against, but provision needs to be made in advance should they arise.

In a territory where a phase-out is required, if multiple registrants are affected, they could form a legally recognized taskforce with a leader, a governance group, and sufficient staff to operate the programme. This taskforce should have a fully costed plan involving all aspects of the phase-out, including communication, and sufficient funding should be allocated by the membership. The taskforce will have a designated person to lead contact with the relevant authorities. The phase-out plan that is drawn up, including the overall timeline, milestones, and a budget, should be agreed upon by the national authorities. To build trust and acceptance of the plan, it should be available to stakeholders for comment in advance of the phase-out programme commencing.

The individual contributions to the funding of the phase-out according to the agreed programme could be in proportion to the average sales of the affected products that each member made over the previous three years. A limit should be set on the liability of members of the taskforce for the phase-out as an incentive for them to contribute.

.../cont.

Companies active in the sale and distribution of the phase-out of the product who do not join the taskforce will have no limit set on their liability about phasing out their products from the market. A publicly available report should be made at the end of the process outlining achievements of the phase-out along with the strengths and weaknesses of the processes used.

Source: Author's own elaboration.

6. Developing a risk reduction phase-out plan

A pesticide risk reduction phase-out plan is led by governments and developed through consultations with stakeholders aiming to address grower- and vector-control needs for risk management tools and practices for high-risk pesticides. The goal is to promote and facilitate adoption of reduced risk solutions. Each country should develop their own risk reduction phase-out plans to manage pesticide risks specific for their use contexts. Such plans need to be developed and implemented by a participatory approach at the national level. Table 4 summarizes the basic elements, and examples within those elements, of a risk reduction phase-out plan.

Table 4. Risk reduction phase-out plan

Details of plan	Stakeholders´ roles, opportunities and responsibilities	Timeframe
1. Phase-out strategy		
Contemporary analysis of existing policy frameworks and pest and pesticide management practices	Governments, research institutions, private sector, multilateral organizations, and non-governmental organizations (NGOs) have an important role in identifying the functionality and shortcomings of existing practices.	Long time
Development of relevant policies for faster or more efficient phase-out practices	Governments, research institutions, private sector and multilateral organizations drawing on knowledge of local legislation and agricultural and vector control practices, and international experiences, can propose mechanisms to improve phase-out.	Long time
Formulation and implementation of a cohesive national framework and regulations in support of integrated pest management (IPM) and integrated vector management (IVM) for phasing out identified harmful pesticides	Governments, NGOs, donors, international organizations, and other institutions have the responsibility to establish frameworks that support judicious use of pesticides, encourage IPM and IVM and provide viable mechanism to adopt safer and more desirable products and farming practices. Actions should include implementation of national risk reduction guidelines informed by the FAO/WHO *Code of Conduct on Pesticide Management*.	Long time
Research on substitute substances or practices that support effective pest, vector, and disease management	National and international research community, civil society and other corporate entities – governments should look to establish a sound engagement process with pesticide suppliers, to allow rapid identification of alternatives where a phase-out may occur.	Long time
Implementation of signed or ratified international conventions and agreements	Governments, private sector, NGOs, international organizations, and other institutions are responsible to monitor and comment on compliance with their obligations to agreements.	Long time

2. Legal aspects		
Set rules and procedures for efficient approval of lower-risk pesticides as alternatives for phased-out products	Governments, the national and international research community, and pesticide industry/companies have a crucial role in reviewing and setting regulations that improve the safety of farm workers, consumers and the environment.	Long time
Regulate manufacturers, distributors, wholesalers, and retailers so only approved pesticides are supplied to users	Governments, manufacturers, distributors, wholesalers, and retailers have a collective obligation to ensure the safety of pesticide users through the supply of approved products.	Short time
Establish legal grace periods or timelines for phasing out a pesticide following the formal decision to withdraw its registration or ban it	Governments, manufacturers, distributors, wholesalers, and retailers will benefit from certainty in timeframes for action and can be expected to establish processes that comply with those timeframes.	Short time
Require the public notification of the cancellation of a pesticide's registration in the country's national gazette or other national document	Government communication of changes in regulatory status supports society in informed choices and to cooperate with the phase-out.	Short time
3. Risk reduction activities		
Build capacities in national authorities to conduct phase-out activities	Governments must ensure there is sufficient capability to give effect to legal requirements and achieve safety outcomes intended from a phase-out.	Short time
Promote IPM in agriculture and IVM for public health or other pest control approaches and seek a year-on-year increase in number of farmers using such approaches	Governments, research institutions, private sector, mass media, farmers, local communities, and farmer unions can all contribute to adoption of best practice in pest and disease management, achieving improvements in farm, consumer and environmental health and safety.	Short time
Training in the safe and effective handling and use of pesticides, including hazard identification and mitigation, safe use, alternatives (pesticide and farm practice), storage and transportation	Governments, private sector, international organizations, multi-and bilateral external support agencies and other institutions can contribute to the continuing knowledge and expertise of multiple parties to prevent pesticide risks including pesticide importers, storage persons, transporters and retailers, users (including farmers, government technicians and extension workers, commercial applicators), doctors, nurses, paramedics, and the general public.	Long time
Voluntary information campaigns that promote safe pesticide use and the adoption of IPM/IVM	NGOs and farmer unions are key influencers on agricultural practices and can provide information that improves safety and reduces environmental impact in a format that is appropriate for the user.	Long time
Prevent misleading statements about pesticide products, including in advertising and at points of product distribution	Governments, private sector, and the mass media can contribute to effective phase-out through ensuring accuracy in statements made about pesticide products; this should include the ability for legal redress and enforcement.	Short time

Establish risk reduction programmes and encourage industry stewardship for the life cycle of the product	Private sector, NGOs, and international organizations can actively contribute to phase-out activities through established product stewardship programmes. Programmes should cover the life cycle of the product and include disposal. Consideration could be given to requiring participation in stewardship programmes as a condition of product approval.	Long time
Conduct awareness-raising among pesticide regulators and other relevant government players, farmers, the private sector, consumers, workers, trade unions, healthcare providers, research and development institutions, academia, and the press (mass media), about the potential risks of phased-out pesticides and the availability of alternatives that are less hazardous	Greater knowledge across all components of government, private sector, NGOs, and the community on phased-out pesticides, the actions needed, and importantly the rationale for a phase-out decision, will improve the effectiveness of the phase-out. Communication can include the involvement of the mass media, schools, and universities.	Short time
Post activity review of successes and challenges in implementation of a phase-out	Governments, private sector, NGOs, the mass media, and farmer unions should, at the completion of a phase-out, review the actions taken and their effectiveness in managing pesticide risk. This should consider all the sectors or persons intended to be protected by the original decision and include direct engagement with farmers and local communities impacted by the phase-out.	
4. Risk communication activities		
Development of a risk communication plan immediately after the decision to phase out a pesticide	Government should develop the plan to engage retailers, industry, farmers, users, and the general public on the rationale for phase-out, the risks that are being controlled, actions they each need to take and the timeframe for action. Industry, farmers, users, and the general public should seek to engage and comply with the actions detailed in the plan, and if needed contribute to refinement of the plan.	Short time
Share risk and benefit information to enable people to make informed judgments about use of regulated products	Government, farming sectors, and chemical industry, should develop information for distribution, for e.g. through the mass media, providing guidance on the risks and benefits of regulated products.	Short time
Undertake information, education and communication about the risks of phased-out pesticides involving pesticide regulators and other relevant government authorities, farmers, the private sector, consumers, workers, trade unions, healthcare providers, research and development institutions, academia and the press (mass media)	Programmes can be established by, or in combination with, governments, private sector, or NGOs. All programmes should present evidence-driven factual positions and be supported by government in accessing key facts surrounding a phase-out. Programmes should include beekeepers, organic farmers, landowners, and other ancillary persons potentially likely to be exposed, as well as those directly using or applying a phased-out product such as farmers or pesticide applicators.	Short time

5. Financing activities		
Explore possible funding sources from donors and industry that may support phase-out activities	Industry/company and multi-and bilateral external support agencies. Implementing extended producer responsibility laws.	Long time

Note: short time = up to 2 years; long time = up to 5 years.

FAO and WHO welcome readers' feedback

FAO and WHO welcome readers' feedback on use of these guidance notes. FAO and WHO consider that these guidance notes are a living document that could be further improved. They therefore particularly value any feedback from users of the guidance and welcome any comment. They also value examples of how the guidance was used.

Please send your suggestions, comments and examples to pesticide-management@fao.org, indicating the title of the guidance and the relevant section and page.

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Phasing out hazardous pesticides is a critical step toward safeguarding human health, protecting ecosystems, and advancing sustainable agriculture. This FAO/WHO guidance document offers a comprehensive roadmap for governments, regulators, and stakeholders to manage the risks associated with pesticide withdrawal, cancellation, or voluntary removal. Developed under the FAO/WHO International Code of Conduct on Pesticide Management, the publication provides actionable strategies for countries, especially low- and middle-income nations – to navigate the complex legal, technical, and social dimensions of pesticide phase-out.

Readers will discover practical tools for selecting phase-out options, minimizing negative impacts, and implementing risk communication and reduction plans. The guidance highlights real-world examples from several countries, showcasing diverse approaches to regulatory reform, stakeholder engagement, and disposal of obsolete stocks. It also outlines legal frameworks and international obligations, including the Stockholm and Rotterdam Conventions, and emphasizes the importance of transparency, enforcement, and financing mechanisms.

Whether addressing highly hazardous pesticides (HHPs) or managing voluntary withdrawals, this publication equips decision-makers with the knowledge to design effective, science-based phase-out strategies. It promotes integrated pest and vector management, supports the development of safer alternatives, and encourages inclusive dialogue among farmers, industry, civil society, and government institutions.

This guidance is essential reading for anyone involved in pesticide regulation, public health, environmental protection, or sustainable development. It is a vital tool for achieving the Sustainable Development Goals and ensuring a safer future for all.

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