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Review of existing legislation to protect pollinators from pesticides in selected countries



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1. Introduction and overview

1.1 Introduction

Honeybees (*Apis mellifera*), wild bees, and other pollinators can be adversely affected by pesticides as well as other stressors, with potentially large economic and ecological consequences. Legislation is one possible tool which can be used to support actions to protect pollinators from pesticides. Several documents have been published at the international level to provide guidance on the development of pesticide legislation, environmental legislation, and so on. For example, the *FAO-WHO International Code of Conduct on Pesticide Management – Guidelines on Pesticide Legislation (2nd Edition)* provides detailed point-by-point guidance for the development of national pesticide laws. However, the protection of pollinators is not specifically discussed in these Guidelines. Currently, no comprehensive review has been identified of the different legislative approaches taken by countries to protect pollinators from pesticides, or broader legislation that can be used directly or indirectly to support actions to protect pollinators from adverse effects caused by the use of pesticides.

1.2 Objectives

Accordingly, the objectives of the present review are to:

- compile examples of provisions from legislation in selected countries that can be used directly or indirectly to support actions to protect pollinators from adverse effects caused by the use of pesticides;
- identify trends in the organization and content of such legislation across the selected countries; and,
- identify potential gaps and good practices in current legislation of selected countries.

This review is intended to contribute background information to the *FAO Global Seminar on Strengthening Regulations to Protect Pollinators from Pesticides* to be held in February 2022, within the context of capacity building related to Phase III of the African, Caribbean and the Pacific Countries (ACP) Multilateral Environmental Agreements (MEAs) Programme (abbreviated ACP MEAs 3).

1.3 Country coverage

This review primarily focuses on observed examples from ten selected ACP MEAs 3 project countries – Dominica, Kenya, the Niger, Rwanda, Saint Lucia, Samoa, Solomon Islands, United Republic of Tanzania, Zambia, and Zimbabwe. Together, these ten countries are referred to as the “Focus Countries” for the purposes of discussing trends within the group. In addition, this review makes reference to certain limited examples drawn from four countries (*i.e.* Australia, China, Ireland, and the United States of America). Together, these four countries are referred to as the “Reference Countries” for the purposes of discussing trends within the group. Within the federal systems of Australia and the United States of America, some limited state-level examples are also drawn from New South Wales in Australia and California in the United States

of America, respectively, where relevant. For Ireland and the Niger, regional (international) instruments play an important role, and for these cases, some limited examples are also drawn from European instruments and the Economic Community of West African States (ECOWAS) and the Permanent Interstate Committee for Drought Control in the Sahel (*Comité permanent inter-États de lutte contre la sécheresse dans le Sahel; CILSS*) instruments respectively.

1.4 Approach

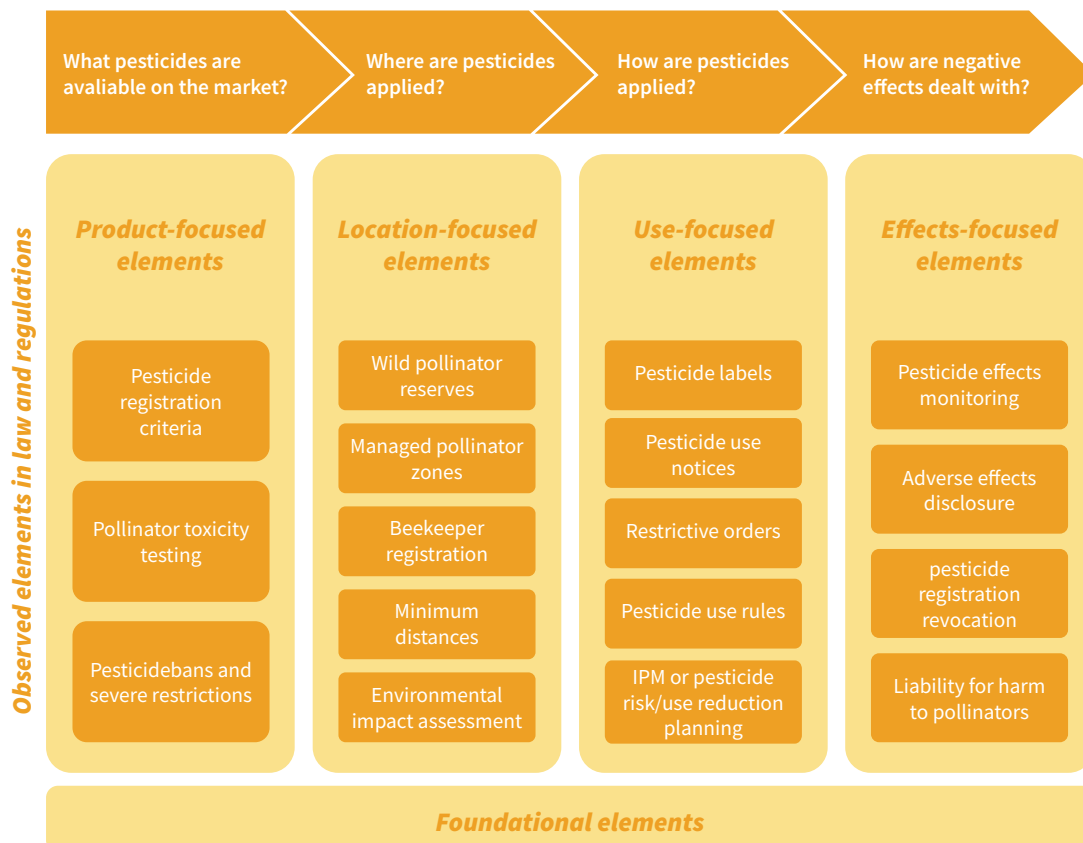
This review entailed several steps. First, a legal consultant reviewed academic background literature, reports, government websites and international and national legislation databases to help identify primary-level laws and secondary-level regulations with potential relevance to the protection of pollinators from pesticides. Concurrent with this effort, the consultant sent questionnaires to pre-identified focal points for pesticides and biodiversity in each focus country and reference country to identify additional possibly relevant laws and regulations. Responses to this questionnaire effort were limited. From among focus countries, responses were received for Kenya, Saint Lucia, Solomon Islands, and Zimbabwe. From among Reference Countries, responses were received for Australia, European Union/Ireland, and the United States. Following the desk research and focal point questionnaire efforts, the collected set of laws and regulations spanned the domains of pesticides, beekeeping, animal production, environment, and biodiversity. Only laws and regulations that were in-force in the focus countries and reference countries as of May 2021 were included. Next, the consultant reviewed and analysed the text of the collected laws and regulations to take note of specific provisions capable of being used to contribute to the protection of pollinators for pesticides. Noted provisions were then organized with other observed provisions that share a similar function and underlying objective in order to distill a common set of “elements” observed in the laws and regulations of focus countries that can be used to directly or indirectly protect pollinators from pesticides.

2. Elements observed in laws and regulations

Across the focus countries and reference countries studied in this review, more than a dozen different legal elements have been observed which can theoretically be used directly or indirectly to support actions to protect pollinators from adverse effects caused by the use of pesticides.

For the purposes of this review, the elements observed in the laws and regulations of Focus Countries have been organized into four thematic areas, as illustrated in **Figure 1** below: (i) product-focused elements; (ii) location-focused elements; (iii) use-focused elements; and, (iv) effects-focused elements. Product-focused elements share a common underlying regulatory objective of seeking to reduce the likelihood that pesticides on the market have properties that are toxic to pollinators. Location-focused elements share a common underlying regulatory objective of seeking to reduce the likelihood that pesticides are applied near locations deemed particularly important for wild pollinators or managed pollinators. Use-focused elements share a common underlying regulatory objective of seeking to ensure that pesticides, when applied, are applied in a manner that is less harmful to pollinators. Finally, effects-focused elements share a common underlying regulatory objective of seeking to observe, track and respond to negative or unexpected effects on pollinators from pesticide use.

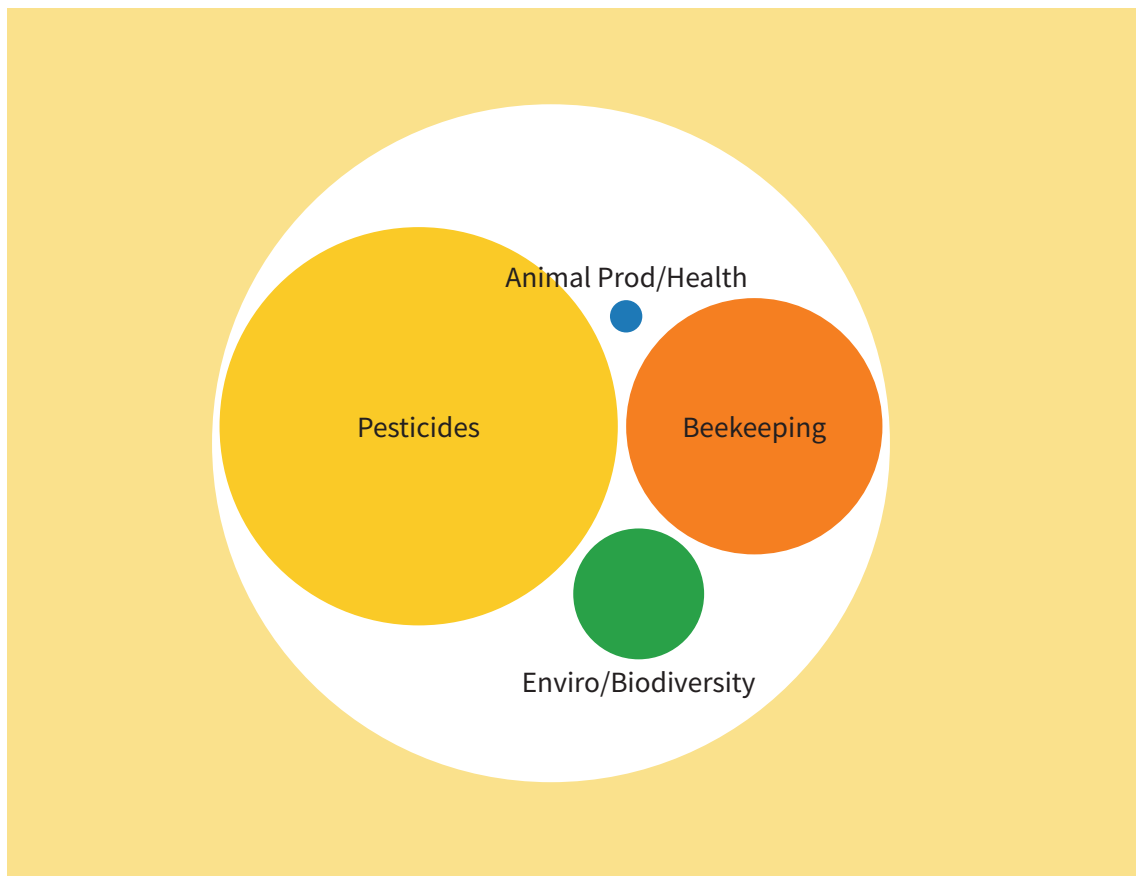
FIGURE 1
Points of intervention and observed elements in the laws and regulations of focus countries.



As shown in the matrix in the **Annex** of this review, these elements have been observed in various combinations across the focus countries, with some countries having almost all of them present in their legal framework, and other countries having just a few. Out of the Focus Countries, United Republic of Tanzania and Rwanda appear to have a broader range of elements to protect pollinators in their legal frameworks. The Reference Countries studied tend to be pretty similar in scope, and all tend to have elements spanning the product, use, and effects groups. Across all countries studied, most elements are found in pesticide legislation, followed by beekeeping legislation and general environmental protection or biodiversity legislation.

These product-focused elements, location-focused elements, use-focused elements, and effects-focused elements will be further defined and discussed in detail in the following sections. But first it is important to recognize that all of these elements must be supported by foundational elements critical for successful implementation. This includes having well-tailored, comprehensive broader legal frameworks for pesticides, animal production and beekeeping, environmental protection and biodiversity. It also includes broader individual elements such as prescribing offences and penalties, defining powers to make subsidiary regulations, inspection mandates and powers, enforcement procedures, compliance standards, training and competence requirements, and so on. While these foundational elements are beyond the scope of the present review, they are nonetheless important to keep in mind when assessing each country's framework for the purposes of deeper dialogue and potential reform.

FIGURE 2
Observed elements by legislative domain across all countries studied for this review.ⁱ



ⁱ Illustration created using RAWGraphs.

2.1 Product-focused elements

2.1.1. Pesticide registration criteria

The first element highlighted in this review relates to pesticide registration criteria. Thus, legislators and regulators may require the competent authority to consider effects on pollinators when authorizing or registering a pesticide for use in the country. This may either take the form of affirmative criteria to be authorized or registered, or criteria for refusal of an application to register a pesticide. While conceivably this could involve an explicit requirement to consider effects on pollinators, what has been commonly observed in the Focus Countries is a more general, broader requirement to consider effects on animals and the environment.

Thus, in the United Republic of Tanzania, pesticides that are highly toxic or cause poisoning effects to humans and animals shall not be registered unless the government sub-committee responsible for pesticide registration imposes additional conditions and restrictions for its safe use and disposal. In Rwanda, the registrar responsible for pesticide registration shall consider negative impacts to the health of living beings and the environment, and may reject an application to register a pesticide if use of the pesticide would lead to an unacceptable risk or harm to public health, plants, animals or the environment. Similarly, the board responsible for pesticide registration in Kenya may refuse to register a pesticide if its use would lead to an unacceptable risk or harm to public health, plants, animals or the environment. With respect to the Niger, pesticide registration criteria are set at the regional level and these are referenced in national legislation; within ECOWAS, pesticide registration criteria must include consideration of harmful impact and dangers posed to the environment, and under CILSS regulations, a pesticide can only be registered if it is not harmful to non-target fauna under normal conditions of use in the Sahel and it has no unacceptable effects on the Sahelian environment. In Dominica, the Board responsible for registering pesticides may refuse to register a pesticide if use of the pesticide may constitute a risk to domestic animals, wildlife or the environment. In Samoa, the Committee responsible for registering pesticides must consider toxicological data and environmental factors including effects on non-targeted species; registration may be refused if a pesticide is too hazardous to animal health or the environment.

Such general requirements are also common across the Reference Countries examined. Thus, China's regulations prescribe that toxicology and environmental impact must be considered by the competent government authority when deciding whether to register a pesticide, and the regulations encourage the phase out of pesticides with risks to animal safety and the environment. In Australia, pesticides must meet safety criteria in order to be approved and registered, including that it would not likely have an unintended effect that is harmful to animals, plants, or things or to the environment. In the United States of America, the Administrator responsible for registering pesticides shall register a pesticide if, among other factors and subject to any prescribed conditions, it will perform its intended function with unreasonable adverse effects on the environment and when used in accordance with widespread and commonly recognized practice it will not generally cause unreasonable adverse effects on the environment. In Ireland, per European Union (EU) requirements, pesticides must have no unreasonable effects on the environment, including non-target species, biodiversity, or ecosystems. Beyond this core element in laws or regulations, Reference Countries also tend to have put in place extensive further details in subsidiary guidelines or other subsidiary instruments to define when an effect of a pesticide on pollinators will be considered acceptable or not in the evaluation of an application for pesticide registration.

2.1.2 Pollinator toxicity testing

Legislators and regulators may require testing for toxicity to pollinators as a part of pesticide registration requirements. This may take the form of information to be filled out or attached to a standard form to be submitted when an applicant seeks to register a new pesticide. Thus, both Kenya and Saint Lucia require applicants seeking to register a pesticide to submit information about toxicity to bees and other non-target organisms. With respect to the Niger, at the regional level CILSS regulations prescribe the composition of the dossier to be submitted with an application for pesticide registration; this includes studies of the effects of the pesticide on beneficial arthropods, including honeybees. Similarly, in Dominica, the dossier for pesticide registration must include testing information about the toxic effects the use of that pesticide may have on bees, other wildlife, domestic animals and the environment. In the Solomon Islands, the Committee responsible for registering pesticides shall classify pesticides by hazard according to toxicological data, including hazards to bees.

Requirements to conduct toxicity testing for effects on pollinators are extremely detailed across the reference countries examined. Thus, China's regulations specify in detail the toxicity testing results that must accompany applications to register a new pesticide, and this includes acute toxicity test data for honeybees. Australia requires testing the toxicity of products in relation to relevant organisms and ecosystems. In the state of California in the United States of America, regulations prescribe that any registration application for a pesticide likely to contact pollinating bees must include testing data for acute toxicity to bees. European requirements are extensive and detailed when it comes to requirements to conduct testing for effects on arthropods, including specific provisions on testing for effects on bees.

2.1.3 Pesticide bans and severe restrictions

Legislators and regulators may provide for banning or severely restricting pesticides because of potential harm to pollinators. The ban or severe restriction may take the form of a ban or restriction on use, and/or on other activities such as importing, manufacturing, or distribution. While conceivably provisions that enable banning or severely restricting pesticides could specify harm to pollinators as a reason, observed provisions tend to frame such provisions more generally in terms of impacts on animal life or the environment, among other factors.

For example, the United Republic of Tanzania provides for both temporary prohibitions and full bans, which may be due to damage to animal health or the environment; once a pesticide is banned, it is forbidden to "import, manufacture, transport, distribute, export or sell restricted or banned pesticides, and the list of banned or restricted pesticides is to be published in the country's gazette. Rwanda provides for banning any pesticide that has been refused registration or had its registration withdrawn, with the list of banned pesticides published in a ministerial order. In Zambia, the competent Minister may ban, severely restrict, or restrict the use of product of pesticides likely to be harmful to animal life or the environment, and the banned pesticide shall be published in a newspaper of general circulation within seven days. For the Niger, at the regional level, both ECOWAS and the Sahelian Pesticide Committee are charged with developing a list of pesticides that are banned or severely restricted for health or environmental reasons within respective member states. Although there is no mention of environmental criteria or other criteria specifically, Saint Lucia grants full discretion to the competent Minister to add or remove pesticides from a list of banned pesticides included as a schedule in legislation. Dominica grants power to the competent Minister to make regulations prohibiting certain pesticides or classes of pesticides, and this was exercised in 2020 with the publication of a list of pesticides that may not be imported into the country.

Apart from China, the reference countries studied tend to not have specific legal provisions on the affirmative banning of specific pesticides, but instead, these jurisdictions tend to focus on a pesticide's status as authorized or not, and if authorized, the imposition of any restrictions on use. Thus, China provides that the Ministry of Agriculture shall publish and periodically adjust a list of prohibited pesticides, makes it an offence with monetary penalties to use prohibited pesticides. This is in contrast, for example, to recent actions in the European Union with respect to certain neonicotinoids, actions which tended to focus on authorization status and use restrictions. For further discussion, see above under 2.1.1. Pesticide registration criteria.

2.2 Location-focused elements

2.2.1 Wild pollinator reserves

Legislators may provide for the declaration of important wild pollinator habitats as protected areas where activities potentially harmful to pollinators are restricted. This could be exercised within a country's general framework for protected areas, or within a framework specific to the protection of wild pollinators. One example of the latter has been observed in the countries studied. The United Republic of Tanzania's legal framework provides for the declaration and management of bee reserves. The *Beekeeping Act* prescribes the procedure to establish and formally recognize bee reserves in the official gazette, and then to modify bee reserves if desired thereafter. Bee reserves may be established at the national level, the local authority level, the village level, or on a private landholding. The government may delegate management of a bee reserve to a particular agency division, local authority, village, individual, private sector company, or non-governmental organization, or bee reserves may be jointly managed by two or more entities or levels via a joint management agreement. Within bee reserves, it is prohibited to use any pesticides that have been classified by an authorized research institute as being likely to cause harm to bees, bee activities, bee fodder plants or bee products.

2.2.2 Managed pollinator zones

Similar to the wild pollinator reserves discussed above, regulators may also declare areas where apiaries will benefit from special protections from the effects of pesticide use. Three examples of managed pollinator zones have been observed among the countries studied. In the United Republic of Tanzania, the competent government authority may establish a beekeeping zone on public land upon its own initiative or upon request by local stakeholders. After a beekeeping zone has been established through a procedure involving notice and consultation, any person, group, or organization may apply to keep bees in a beekeeping zone, with a preference given to those living closest to the beekeeping zone. Within and nearby a beekeeping zone, developers are required to undertake an environmental impact assessment before pursuing an agricultural development on five hectares or more where pesticides harmful to bees will be applied. In Zimbabwe, a local conservation committee may recommend the declaration of a specified area if it determines that pesticide use in the area concerned is likely to be harmful to bees. Once a specified area has been declared, beekeepers with apiaries in that specified area will benefit from special timely notification rules for when pesticides are to be applied within five km. Regulations in the state of California in the United States of America prescribe the creation of bee protection areas surrounding citrus groves in certain regions of the state. Similar to Zimbabwe, beekeepers within bee protection areas benefit from special notification rules for when pesticides are to be applied nearby.

2.2.3 Beekeeper registration

Legislators and regulators may require keepers of managed pollinators to submit information about the location of their activities. This may take the form of a requirement to submit information about the location of beekeeping activities, to registration and certificate systems, to permit requirements. Collecting information about the location of managed pollinators is a fundamental precursor to other regulatory options such as notifications of pesticide use, and environmental impact assessments. It can also bring other benefits such as possibly providing secure locations for certain beekeeper, providing a means of tracking carrying capacity, and providing a means of tracking disease.

For example, the United Republic of Tanzania has granted power to the competent minister to establish a system for the registration of beekeepers, and this power has been exercised in subsequent regulations. Thus, in the United Republic of Tanzania, it is mandatory for beekeepers to register and be issued a certificate of registration, and failure to register is made an offence.

A designated government official maintains the registry and keeps track of specified details, including the name and address of beekeepers and the locations where beekeeping is carried on. In Rwanda, beekeepers must apply for a two-year certificate from the Rwanda Agricultural Board. The certificate must contain information about the location of apiaries kept by the beekeeper. In Zambia, beekeepers are required to apply for a permit from the government, and the procedures for doing so are specified in regulations. In the state of California in the United States of America, beekeepers are required to register with designated local officials the locations of their apiaries at the beginning of each year, and failure to register is made an offence.

Box 1. Stakeholder engagement and the united republic of tanzania's bee reserves

The United Republic of Tanzania's *Beekeeping Act (2002)* includes several legal provisions that can be used to ensure the engagement of stakeholders in furthering policy objectives. For example, the first step in establishing a bee reserve is to widely publicize plans via a variety of means to inform stakeholders. The Act provides for a public comment period and public meetings for stakeholders to discuss the plans and provide their views. The same stakeholder engagement framework is also applied to any proposals to alter or discontinue bee reserves so that stakeholders can share their views.

2.2.4 Minimum distances

Legislators and regulators may require certain minimum distances between managed pollinator activities and areas where pesticides are applied. The United Republic of Tanzania prescribes several requirements for where apiaries may be located in relation to agricultural fields where pesticides are applied. Apiaries may only be established at least seven (7) km away from tobacco farms and any other area where pesticides are applied, unless integrated pest management is practiced in the area. Spraying pesticides during the day is prohibited within seven (7) km of an apiary.

2.2.5 Environmental impact assessment

Legislators and regulators may impose a requirement to conduct an environmental impact assessment prior to the issuance of a permission to apply pesticides in a location or at a scale that may impact pollinators. Thus, in the United Republic of Tanzania, conducting an environmental impact assessment is required for any agricultural or horticultural development larger than five hectares, in or near a bee reserve or beekeeping zone, where pesticides hazardous to bees will be used; the environmental impact assessment is required to include an integrated pest management plan designed to minimize impacts on bees.

A few countries studied explicitly list pesticide use among those activities that trigger the need to conduct an environmental impact assessment. However, these countries do not specifically consider or require a focus on impacts on pollinators. For example, in Rwanda, conducting an environmental impact assessment is required before authorization of any new agricultural activities using pesticides in wetlands, and large-scale agricultural activities on hillsides. In the Niger, conducting an environmental impact assessment is required before authorization of aerial or terrestrial spraying of pesticides for non-agricultural purposes over an area of 600 or more hectares. The Solomon Islands requires an environmental impact assessment before authorization of pesticide use generally.

2.3 Use-focused elements

2.3.1 Pesticide labels

Legislators and regulators may require that pesticide labels contain information about potential hazards to pollinators and/or precautions to mitigate hazards to pollinators. Labels may contain both advisory and compulsory language. Such information requirements may be narrowly focused on pollinators, or more generally framed in terms of hazards to animals or the environment. Several examples of the latter have been observed among studied countries. Thus, pesticides in Rwanda are required to contain labels with statements or prohibiting directives on use which may be necessary to protect animals or the environment. In Kenya, pesticides are required to have labels that contain statements identifying any significant hazard to animals or the environment as well as instructions regarding the procedures to alleviate such hazards to animals or the environment. In Saint Lucia and Dominica, pesticides are required to have labels that contain appropriate instructions for the protection of domestic animals, wildlife and the environment.

The reference countries studied tend to require labeling information specific to pollinators. Similar to Kenya, in China, it is required to clearly state on pesticide labels any likely adverse impacts on beneficial organisms (such as bees) and the environment more generally, as well as preventive measures to alleviate such impacts. Pesticide labels in Australia are required to comply with the Agricultural Labelling Code, which requires specific information and instructions necessary for the protection of honeybees and other insect pollinators. In the United States of America at the federal level, the United States Environmental Protection Agency requires that a pesticide's label contain statements about hazards to non-target organisms such as pollinating insects, and appropriate precautions to avoid such hazards. European requirements for pesticide labels are extremely detailed, and include specific safety precaution language related to managing effects on pollinating insects.

2.3.2 Pesticide use notice

Legislators and regulators may require that advance notice be provided to beekeepers prior to the application of potentially harmful pesticides. For example, in the United Republic of Tanzania, local government authorities serve as the conduit for notifications of pesticide use. Beekeepers are required to notify local government authorities of the presence of their apiaries, and persons intending to apply pesticides must communicate advance notice to local beekeepers through a notification to the local government authority. Zimbabwe prescribes a similar system of advance notice of pesticide application for beekeepers located in specified areas (see above under Managed Pollinator Zones). Thus, a beekeeper located in a specified area may write to local land occupiers within five km of an apiary, with copy to the local conservation committee, to inform them of their need to receive advance notice of forty-eight hours before pesticides are ap-

plied, as well as to receive advance information about what pesticide is to be applied and how. After a land owner receives notice from a beekeeper, the land owner is then obligated to provide this advance notice to the beekeeper before applying pesticides, with copy to the local conservation committee. Failure to comply with these notification requirements is subject to monetary penalties or imprisonment.

2.3.3 Restrictive orders

Legislators and regulators may provide competent authorities with the power to restrict activities to reduce the likelihood of pesticide impacts on pollinators. Depending on the country context, this may take the form of restrictions on pesticide use, or restrictions on beekeeping. Thus, the competent authorities for pesticides in the United Republic of Tanzania and Zambia have the power to issue an order to restrict pesticide usage when there are reasonable grounds to believe that the use of a pesticide is likely to cause damage to animals or the environment more generally; failure to comply with such an order is made an offence. On the other side, the competent authorities for beekeeping in the United Republic of Tanzania and Zimbabwe have the power to issue an order restricting the keeping of bees in any area where premises are unsuitable for beekeeping.

If the Environment Protection Authority in New South Wales, Australia suspects that pesticides are being used in an environmentally unsatisfactory manner, the Authority may direct a pesticide user to change how the pesticides are being used, to restrict or stop pesticide use, or require other measures such as further notification to affected parties or developing and implementing a plan to reduce environmental impacts; failure to comply with the directions of the Authority is made an offence subject to monetary penalties. In the state of California in the United States of America, the competent authority responsible for pesticides is given the power to order pesticide users to cease and desist from an activity that is likely to present an immediate hazard or cause irreparable damage. In Ireland, authorized officers are given the power to issue a compliance notice restrict pesticide use or the manner in which pesticides are used when the officer has reasonable grounds to suspect that pesticide use would damage animal health or welfare or the environment.

2.3.4 Pesticide use rule

Legislators and regulators may require that pesticide users take steps to protect pollinators from harm when applying pesticides. The United Republic of Tanzania broadly requires that pesticides shall not be used in a manner likely to cause adverse effects on the environment and shall not be used in contravention of pesticide product specifications or any legal or regulatory requirement. In addition, specific to pollinators, the United Republic of Tanzania provides that pesticide spraying during the daytime is prohibited within seven km

Box 2. Facilitating relations between stakeholders in California through pesticide use notices

California grants power to the state's competent authority to promulgate specific pesticide use rules to protect bees. Beekeepers are required to notify the local government authority of their presence for the purposes of pesticide application notifications. For better coordination across local boundaries, the competent government authority is also given the power to establish regions spanning local government boundaries wherein advance notice of pesticide applications will be given to beekeepers.

A person intending to apply pesticides that are potentially harmful to bees must first inquire with the local authority and provide advance notice of at least forty-eight hours to any beekeepers that have notified the local authority. The advance notice must include "the time and place the application is to be made, the crop and acreage to be treated, the method of application, the identity and application rate of the pesticide to be applied and how the person performing pest control may be contacted by the beekeeper."

of an apiary. In Rwanda, a person may only spray pesticides for agricultural purposes outside of flowering periods and if it will not harm or kill bees; in addition, spraying may only be done at nighttime, and the product option least toxic to bees must be selected.

In China, pesticide users are required to protect beneficial organisms and environment when applying pesticides, and agricultural and environmental authorities are mandated to strengthen guidelines for users to govern the application of pesticides and to prevent pollution. Australia accomplishes a similar function by explicitly requiring each pesticide user to read each pesticide label before each use, to comply with all provisions on the label, and then requiring the inclusion of instructions to prevent harm to pollinators on the label. Pesticide users in the state of California in the United States of America are required to exercise reasonable precautions to avoid contamination of the environment, and no pesticides may be applied when there is a reasonable possibility of damage to nontarget species. California grants power to the state's competent authority to promulgate specific pesticide use rules to protect bees. Pesticide users in Ireland are required to apply good practice principles published by the competent authority, which include, for example, that pesticides used should have the least possible side effects on non-target organisms and the environment.

2.3.5 IPM or pesticide risk/use reduction planning

Legislators and regulators may require integrated planning or other similar measures to reduce the overall use of pesticides or the impact of pesticides on pollinators. This may take the form of promoting or requiring the implementation of integrated pest management. It may also take the form of detailed requirements to develop and implement plans to reduce the use of pesticides or their impacts, or encouraging voluntary measures. While conceivably such planning could consider impacts on pollinators, observed provisions in legislation tend to focus more broadly on reducing impacts on the environment.

In the United Republic of Tanzania, the authority responsible for plant health is tasked with the function of promoting integrated pest management. In China, the government is mandated to gradually reduce the use of pesticides in favor of biological controls, physical controls, improved equipment, and other measures. Furthermore, county-level governments in China are required to make and implement plans to reduce pesticide use and encourage pesticide users to voluntarily reduce the volume of pesticides used. In the United States of America, at the federal level, legislation promotes integrated pest management by directing the competent government authority to implement research, demonstration, and education programs on the topic, and directing federal agencies to apply integrated pest management in their own pest management activities. Europe requires member states to adopt national action plans to reduce risks to human health and the environment from the use of pesticides. European member states are further required to take all necessary measures to promote low pesticide-input pest management, including integrated pest management.

2.4 Effects-focused elements

2.4.1 Pesticide effects monitoring

Legislators and regulators may require active monitoring for unintended or adverse effects of pesticide use on pollinators. This may involve the development and implementation of monitoring plans or systems, or just tasking a particular government authority with monitoring. In Rwanda, inspectors under the competent authority responsible for pesticide registration are tasked with supervising pesticide use and monitoring for negative impacts and effects of such pesticides. Zambia provides that the competent government authority should collect data on the use of pesticides and effects on the environment, as well as the presence of pesticides in the environment.

China requires provincial agricultural departments to establish pesticide safety risk management systems to monitor on an ongoing basis the impacts of pesticide use, including impacts on non-target organisms (including bees) and the environment; provincial departments are then required to report monitoring results to the central Ministry of Agriculture. At the federal level in the United States of America, the competent authority shall develop and implement a national pesticide monitoring plan, including monitoring of incidental exposure of animals to pesticides and environmental pesticide pollution.

2.4.2 Adverse effects disclosure

Legislators and regulators may require reporting of observed unintended effects of pesticides on pollinators. Closely related and more specifically, it is also important to note that some Reference Countries also have created specific bee poisoning incident reporting systems that can be either mandatory (*i.e.* prescribed by legislation) or voluntary in nature. Pesticide users, dealers, and producers in China are all obligated to immediately report to local agricultural authorities when they discover new information that a pesticide poses serious harm or a significant risk to animals or the ecological environment. At the federal level in the United States of America, the holder of a pesticide registration must notify the competent government authority about any new or additional factual information regarding a registered pesticide's unreasonable adverse effects on the environment. Subsidiary regulations further specify in detail the information about adverse effects which must be reported. Holders of pesticide registrations in Australia are required to report to the competent authority any new information about the registered product, and failure to report is subject to monetary penalties. Europe requires that the holder of a pesticide authorization must immediately notify the competent authority of the Member State that granted the authorization when the holder becomes aware of potentially harmful effects on animal health or the environment.

2.4.3 Pesticide registration revocation

Legislators and regulators may provide a pathway to cancel a pesticide's registration in light of new information about the pesticide's effects on pollinators. The competent authorities in Kenya and the Niger may suspend or revoke a pesticide registration if new information comes to light that the pesticide is dangerous or unsafe or original registration criteria are no longer met. In Samoa, the competent authority may cancel a pesticide's registration certificate if it is suitably demonstrated that the pesticide causes undesirable harm to animal health or the environment, and notice of cancellation must be published in the national gazette and a public newspaper. Similarly, in Dominica and Saint Lucia, the competent authority may cancel a pesticide's registration when it believes that a pesticide poses a risk to animals or the environment, and the competent authority in Saint Lucia may also issue a recall order.

In Europe, similar to in Kenya and the Niger, the competent authority may withdraw or amend a pesticide's approval if it considers that the pesticide no longer satisfies its approval criteria. In China, the competent authority must organize a pesticide registration review committee to review information about a pesticide's adverse effects to animals or the environment; after the review, the committee may decide to forbid or restrict the use of the pesticide and then publicize the decision to the public. If it becomes clear that a registered pesticide does not meet safety criteria (see above under Pesticide Registration Criteria), then the competent authority in Australia may suspend or cancel the pesticide's registration and order a recall of the pesticide. At the federal level in the United States of America, the competent authority may cancel a pesticide's registration and require a product recall if the pesticide, when used in accordance with common practice, causes unreasonable adverse effects on the environment.

2.4.4 Liability for harm to pollinators

Legislators and regulators may define causes of action or civil penalties for causing harm to pollinators with pesticides. While generally the legal framework of each studied focus country includes at least some provisions that establish penalties for violations of pesticide legislation, this element is intended to encompass more explicit and more specific attempts to deter and penalize off-label uses or misuses of pesticides that harm pollinators. Within focus countries, this element has not been observed thus far. However, there are a few examples that have been observed in the studied reference countries. Thus, for example, in the state of New South Wales in Australia, specific offences with monetary penalties are prescribed for willfully or negligently using a pesticide in a manner that harms any non-target animal. In the state of California in the United States of America, beekeepers may bring an action to recover compensation for damages as a result of nearby pesticide use, as long as they have complied with all requirements regarding registration of apiaries and requesting notice in advance of pesticide use.

3. Country summaries

3.1 Focus countries

3.1 Dominica

Summary: The following elements have observed in the laws and regulations of Dominica which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pesticide registration criteria	Require consideration of effects on pollinators when approving or rejecting a pesticide.
Product	Pollinator toxicity testing	Require testing for toxicity to pollinators as a part of pesticide registration requirements.
Product	Pesticide bans and severe restrictions	Provide for the affirmative listing of pesticides that are banned because of potential harm to pollinators.
Use	Pesticide labels	Require that pesticide labels contain information about potential hazards to pollinators and/or precautions to mitigate hazards to pollinators.
Effects	Pesticide registration revocation	Provide a pathway to cancel a pesticide's registration when new information about the pesticide's effects on pollinators is identified.

The legal framework for protecting pollinators from pesticides in Dominica is primarily concentrated in provisions found in the pesticide domain. The relevant legal framework is anchored by the *Pesticides Control Act, 1974 (1987)*, and further supported by subsidiary regulations in the form of the *Pesticides Control (Registration and Licensing) Regulations, 1987 (1987)*, the *Pesticides Control (Labelling of Pesticides) Regulations, 1987 (1987)*, and the *Pesticides Control (Prohibition) Regulations, 2020 (2020)*.

Relevant legal provisions in Dominica are primarily focused on reducing the likelihood that pesticides on the market have properties that are toxic to pollinators. Thus, in Dominica, the Board responsible for registering pesticides may refuse to register a pesticide if use of the pesticide may constitute a risk to domestic animals, wildlife or the environment. The dossier for pesticide registration must include testing information about the toxic effects the use of that pesticide may have on bees, other wildlife, domestic animals and the environment. Dominica grants power to the competent Minister to make regulations prohibiting certain pesticides or classes of pesticides, and this was exercised in 2020 with the publication of a list of pesticides that may not be imported into the country. Pesticides are required to have labels that contain appropriate instructions for the protection of domestic animals, wildlife and the environment. Finally, the competent authority may cancel a pesticide's registration when it believes that a pesticide poses a risk to animals or the environment.

3.1.2 Kenya

Summary: The following elements have been observed in the laws and regulations of Kenya which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pesticide registration criteria	Require consideration of effects on pollinators when approving or rejecting a pesticide.
Product	Pollinator toxicity testing	Require testing for toxicity to pollinators as a part of pesticide registration requirements.
Use	Pesticide labels	Require that pesticide labels contain information about potential hazards to pollinators and/or precautions to mitigate hazards to pollinators.
Effects	Pesticide registration revocation	Provide a pathway to cancel a pesticide's registration when new information about the pesticide's effects on pollinators is identified.

The legal framework for protecting pollinators from pesticides in Kenya is primarily concentrated in provisions found in the pesticide domain. The relevant legal framework is anchored by the *Pest Control Products Act, 1982 (2009)*. The Act is supported by a suite of subsidiary regulations, including the *Pest Control Products (Registration) Regulations, 1984 (2006)*, and the *Pest Control Products (Labelling, Advertising and Packaging) Regulations, 1984 (2006)*.

Relevant legal provisions in Kenya are primarily focused on reducing the likelihood that pesticides on the market have properties that are toxic to pollinators. Thus, the competent authority responsible for pesticide registration in Kenya may refuse to register a pesticide if its use would lead to an unacceptable risk or harm to public health, plants, animals or the environment. Kenya requires applicants seeking to register a pesticide to submit information about toxicity to bees and other non-target organisms. Pesticides are required to have labels that contain information identifying any significant hazard to animals or the environment as well as instructions regarding the procedures to alleviate such hazards to animals or the environment. The competent authority may suspend or revoke a pesticide registration if new information comes to light that the pesticide is dangerous or unsafe or original registration criteria are no longer met.

3.1.3 The Niger

The legal framework for protecting pollinators from pesticides in the Niger is primarily concentrated in provisions found in the pesticide domain, with a particularly important role for regional instruments. Domestically, the relevant legal framework is anchored by the *Law No. 2015-35 of May 26, 2015 Relating to the Protection of Plants, 2015 (2015)* and its supporting regulation, *Decree No. 2016-303/PRN/MAG/EL of June 29, 2016, Setting Out the Terms and Conditions of Law No. 2015-35 of May 26, 2015 Relating to Plant Protection, 2016 (2016)*. At the regional level, there are two critical instruments: *Regulation C/REG.3/05/2008 on Harmonization of the Rules Governing Pesticides Registration in ECOWAS Region, 2008 (2008)*, and the *Regulations Common to CILSS Member States on the Approval of Pesticides, 1999 (1999)*.

Summary: The following elements have observed in the laws and regulations of the Niger which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pesticide registration criteria	Require consideration of effects on pollinators when approving or rejecting a pesticide.
Product	Pollinator toxicity testing	Require testing for toxicity to pollinators as a part of pesticide registration requirements.
Product	Pesticide bans and severe restrictions	Provide for the affirmative listing of pesticides that are banned because of potential harm to pollinators.
Location	Environmental impact assessment	Require conducting an environmental impact assessment for pesticide use that may impact pollinators.
Effects	Pesticide registration revocation	Provide a pathway to cancel a pesticide's registration when new information about the pesticide's effects on pollinators is identified.

Relevant legal provisions in the Niger are primarily focused on reducing the likelihood that pesticides on the market have properties that are toxic to pollinators. Thus, pesticide registration criteria are set at the regional level; within ECOWAS, pesticide registration criteria must include consideration of harmful impact and dangers posed to the environment, and under CILSS regulations, a pesticide can only be registered if it is not harmful to non-target fauna under normal conditions of use in the Sahel and it has no unacceptable effects on the Sahelian environment. CILSS regulations prescribe the composition of the dossier to be submitted with an application for pesticide registration; this includes the results of studies of the effects of the pesticide on beneficial arthropods, including honeybees. Both ECOWAS and the Sahelian Pesticide Committee are charged with developing a list of pesticides that are banned or severely restricted for health or environmental reasons within respective member states. In the Niger, conducting an environmental impact assessment is required for aerial or terrestrial spraying of pesticides for non-agricultural purposes over an area of 600 hectares. The competent authority in the Niger may suspend or revoke a pesticide registration if new information comes to light that the pesticide is dangerous or unsafe or original registration criteria are no longer met.

3.1.4 Rwanda

The legal framework for protecting pollinators from pesticides in Rwanda consists of provisions in both the agrochemicals domain and the beekeeping domains. With respect to agrochemicals, the relevant legal framework is anchored by *Law No. 30/2012 of 01/08/2012 on Governing of Agrochemicals, 2012 (2012)*, which is supported by a set of subsidiary regulations, including the *Ministerial Order No. 002/11.30 of 14/07/2016 Determining Regulations Governing Agrochemicals, 2016 (2016)*. With respect to beekeeping, the relevant legal framework is anchored by *Law N. 25/2013 of 10/05/2013 Determining the Organization and Functioning of Beekeeping in Rwanda, 2013 (2013)*, and is further supported by *Ministerial Order N. 001/11.30 of 10/12/2014 Relating to Hygiene in Beekeeping and Modalities for Use of Toxic Substances, 2014 (2014)*, and *Ministerial Instructions N. 001/MINAGRI/014 of 10/12/2014 Relating to Positioning of Beehives, Honey Harvesting Equipment and Issuance of Beekeeping Certificate, 2014 (2014)*.

Summary: The following elements have observed in the laws and regulations of Rwanda which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pesticide registration criteria	Require consideration of effects on pollinators when approving or rejecting a pesticide.
Product	Pesticide bans and severe restrictions	Provide for the affirmative listing of pesticides that are banned because of potential harm to pollinators.
Location	Beekeeper registration	Require keepers of managed pollinators to submit information about the location of their activities.
Location	Environmental impact assessment	Require conducting an environmental impact assessment for pesticide use that may impact pollinators.
Use	Pesticide labels	Require that pesticide labels contain information about potential hazards to pollinators and/or precautions to mitigate hazards to pollinators.
Use	Pesticide use rules	Require that pesticide users take steps to protect pollinators from harm when applying pesticides.
Effects	Pesticide effects monitoring	Require active monitoring for unintended or adverse effects of pesticide use on pollinators.

Rwanda's relevant legal provisions span a broad range of aspects of protecting pollinators from pesticides. Thus, in Rwanda, the registrar responsible for pesticide registration shall consider negative impacts to the health of living beings and the environment, and may reject an application to register a pesticide if use of the pesticide would lead to an unacceptable risk or harm to public health, plants, animals or the environment. Rwanda provides for banning any pesticide that has been refused registration or had its registration withdrawn, with the list of banned pesticides published in a ministerial order. Beekeepers must apply for a two-year certificate from the Rwanda Agricultural Board. The certificate must contain information about the location of apiaries kept by the beekeeper. Conducting an environmental impact assessment is required for any agricultural activities using pesticides in wetlands, and large-scale agricultural activities on hillsides. Pesticides are required to contain labels with statements or prohibiting directives on use which may be necessary to protect animals or the environment. A person may only spray pesticides for agricultural purposes outside of flowering periods and if it will not harm or kill bees; in addition, spraying may only be done at nighttime, and the product option least toxic to bees must be selected. Finally, in Rwanda, inspectors under the competent authority responsible for pesticide registration shall supervise the use of pesticide use and monitor for negative impacts and effects of pesticides.

3.1.5 Saint Lucia

Summary: The following elements have observed in the laws and regulations of Saint Lucia which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pollinator toxicity testing	Require testing for toxicity to pollinators as a part of pesticide registration requirements.
Product	Pesticide bans and severe restrictions	Provide for the affirmative listing of pesticides that are banned because of potential harm to pollinators.
Use	Pesticide labels	Require that pesticide labels contain information about potential hazards to pollinators and/or precautions to mitigate hazards to pollinators.
Effects	Pesticide registration revocation	Provide a pathway to cancel a pesticide's registration when new information about the pesticide's effects on pollinators is identified.

The legal framework for protecting pollinators from pesticides in Saint Lucia is primarily concentrated in provisions found in the pesticide domain. The relevant legal framework is anchored by the *Pesticides and Toxic Chemical Control Act, 2001 (2006)*. The Act is supported by subsidiary regulations in the form of the *Pesticides Control (Labelling of Pesticides), Regulations (S.I. 1987 No. 70), 1987 (2006)* and the *Pesticides Control (Registration and Licensing) Regulations (S.I. No. 71 of 1987), 1987 (2006)*.

Relevant legal provisions in Saint Lucia are primarily focused on reducing the likelihood that pesticides on the market have properties that are toxic to pollinators. Thus, Saint Lucia requires applicants seeking to register a pesticide to submit information about toxicity to bees and other non-target organisms. Although there is no mention of environmental criteria or other criteria specifically, Saint Lucia grants full discretion to the competent authority to add or remove pesticides from a list of banned pesticides included as a schedule in legislation. Pesticides are required to have labels that contain appropriate instructions for the protection of domestic animals, wildlife and the environment. The competent authority may cancel a pesticide's registration when it believes that a pesticide poses a risk to animals or the environment, and the competent authority may also issue a recall order.

3.1.6 Samoa

The legal framework for protecting pollinators from pesticides in Samoa is primarily concentrated in provisions found in the pesticide domain. The relevant legal framework is anchored by the *Agriculture, Forests, and Fisheries Ordinance, 1959 (2003)*, and as implemented in detail by the more recent *Pesticides Regulations, 2011 (2011)*.

Relevant legal provisions in Samoa are focused on reducing the likelihood that pesticides on the market have properties that are toxic to pollinators and removing pesticides from the market when negative effects on pollinators are later observed. Thus, in Samoa, the Committee responsible for registering pesticides

Summary: The following elements have observed in the laws and regulations of Samoa which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pollinator toxicity testing	Require testing for toxicity to pollinators as a part of pesticide registration requirements.
Effects	Pesticide registration revocation	Provide a pathway to cancel a pesticide's registration when new information about the pesticide's effects on pollinators is identified.

must consider toxicological data and environmental factors including effects on non-targeted species; registration may be refused if a pesticide is too hazardous to animal health or the environment. The competent authority may cancel a pesticide's registration certificate if it is satisfied that the pesticide causes undesirable harm to animal health or the environment, and notice of cancellation must published in the national gazette and a public newspaper.

3.1.7 Solomon Islands

Summary: The following elements have observed in the laws and regulations of Solomon Islands which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pollinator toxicity testing	Require testing for toxicity to pollinators as a part of pesticide registration requirements.
Location	Environmental impact assessment	Require conducting an environmental impact assessment for pesticide use that may impact pollinators.

The legal framework for protecting pollinators from pesticides in Solomon Islands consists of provisions found in the pesticide domain and the general environment domain. With respect to pesticides, the relevant legal framework is anchored by the *Safety at Work Act, 1982 (1982)* and its subsidiary regulation, the *Safety at Work (Pesticide) Regulations, 1983 (1983)*. With respect to the environment domain, the relevant legal framework is anchored by the *Environment Act, 1998 (1998)* and its subsidiary regulation, the *Environment Regulations, 2008 (2014)*.

Relevant legal provisions in Solomon Islands are focused on reducing the likelihood that pesticides on the market have properties that are toxic to pollinators, and on assessing the potential impacts of planned pesticide use prior to pesticide application. Thus, in the Solomon Islands, the Committee responsible for registering pesticides shall classify pesticides by hazard according to toxicological data, including hazards to bees. The Solomon Islands requires an environmental impact assessment before pesticide use generally.

3.1.8. United Republic of Tanzania

Summary: The following elements have observed in the laws and regulations of the United Republic of Tanzania which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pesticide registration criteria	Require consideration of effects on pollinators when approving or rejecting a pesticide.
Product	Pesticide bans and severe restrictions	Provide for the affirmative listing of pesticides that are banned because of potential harm to pollinators.
Location	Wild pollinator reserve	Declare important wild pollinator habitats as protected areas where activities potentially harmful to pollinators are restricted.
Location	Managed pollinator zones	Declare areas where apiaries will benefit from special protections from the effects of pesticide use.
Location	Beekeeper registration	Require keepers of managed pollinators to submit information about the location of their activities.
Location	Minimum distances	Require certain minimum distances between managed pollinator activities and areas where pesticides are applied.
Location	Environmental impact assessment	Require conducting an environmental impact assessment for pesticide use that may impact pollinators.
Use	Pesticide use notice	Require that advance notice be provided to managers of pollinators prior to the application of potentially harmful pesticides.
Use	IPM or pesticide risk/use reduction planning	Require integrated planning or other similar measures to reduce the overall use of pesticides or the impact of pesticides on pollinators.
Use	Restrictive orders	Provide competent authorities with the power to restrict activities to reduce the likelihood of pesticide impacts on pollinators.
Use	Pesticide use rules	Require that pesticide users take steps to protect pollinators from harm when applying pesticides.

The legal framework for protecting pollinators from pesticides in the United Republic of Tanzania consists of provisions found in the pesticide domain and the beekeeping domain. With respect to pesticides, the relevant legal framework is anchored by the recent *Plant Health Act, 2020 (2020)* and, (pending the development of new regulations) the prior *Plant Protection Regulations, 1998 (1998)*. With respect to beekeeping, the relevant legal framework is anchored by the *Beekeeping Act, 2002 (2002)* and its subsidiary regulation, the *Beekeeping (General) Regulations, 2005 (2019)*.

With respect to focusing on products, in the United Republic of Tanzania, pesticides that are highly toxic or cause poisoning effects to humans and animals shall not be registered unless the government sub-committee responsible for pesticide registration imposes additional conditions and restrictions for its safe use and disposal. The United Republic of Tanzania's regulations leave discretion to the research institute responsible for testing pesticides to determine analyses necessary for registration, and this research institute has published procedures generally requiring toxicological and environmental data to be submitted with an application for registration. The United Republic of Tanzania provides for both temporary prohibitions and full bans, which may be due to damage to animal health or the environment; once a pesticide is banned, it is forbidden to "import, manufacture, transport, distribute, export or sell restricted or banned pesticides, and the list of banned or restricted pesticides is to be published in the country's gazette.

With respect to location, the United Republic of Tanzania's legal framework provides for the declaration and management of bee reserves. The *Beekeeping Act* prescribes the procedure to establish and formally recognize bee reserves in the official gazette, and then to modify bee reserves if desired thereafter. Bee reserves may be established at the national level, the local authority level, the village level, or on a private landholding. The government may delegate management of a bee reserve to a particular agency division, local authority, village, individual, private sector company, or non-governmental organization, or bee reserves may be jointly managed by two or more entities or levels via a joint management agreement. Within bee reserves, it is prohibited to use any pesticides that have been classified by an authorized research institute as being likely to cause harm to bees, bee activities, bee fodder plants or bee products.

In United Republic of Tanzania, the competent government authority may establish a beekeeping zone on public land upon its own initiative or upon request by local stakeholders. After a beekeeping zone has been established through a procedure involving notice and consultation, any person, group, or organization may apply to keep bees in a beekeeping zone, with a preference given to those living closest to the beekeeping zone. Within and nearby a beekeeping zone, it is required to undertake an environmental impact assessment before pursuing an agricultural development on five hectares or more where pesticides harmful to bees will be applied. The United Republic of Tanzania has also granted power to the competent minister to establish a system for the registration of beekeepers, and this power has been exercised in subsequent regulations. Thus, in the United Republic of Tanzania, it is mandatory for beekeepers to register and be issued a certificate, and failure to register is made an offence. A designated government official shall maintain the register and keep track of specified details, including the name and address of beekeepers and the locations where beekeeping is carried on.

The United Republic of Tanzania prescribes several requirements for where apiaries may be located in relation to agricultural fields where pesticides are applied. Apiaries may only be established at least seven (7) km away from tobacco farms and any other area where pesticides are applied, unless integrated pest management is practiced in the area. Spraying pesticides during the day is prohibited within seven (7) km of an apiary. Moreover, the competent authority responsible for plant health is tasked with the function of promoting integrated pest management. Conducting an environmental impact assessment is required for any agricultural or horticultural development larger than five hectares, in or near a bee reserve or beekeeping zone, where pesticides harmful to bees will be used; the environmental impact assessment is required to include an integrated pest management plan designed to eliminate or minimize impacts on bees.

With respect to pesticide use, in the United Republic of Tanzania, local government authorities serve as the

conduit for notifications of pesticide use. Beekeepers are required to notify local government authorities of the presence of their apiaries, and persons intending to apply pesticides must communicate advance notice to local beekeepers through via a notification to the local government authority. The competent authority for pesticides in the United Republic of Tanzania has the power to issue an order to restrict pesticide usage when there are reasonable grounds to believe that the use of a pesticide is likely to cause damage to animals or the environment more generally; failure to comply with such an order is made an offence. On the other side, the competent authority for beekeeping in the United Republic of Tanzania has the power to issue an order restricting the keeping of bees in any area where premises are unsuitable for beekeeping. The United Republic of Tanzania broadly requires that pesticides shall not be used in a manner likely to cause adverse effects on the environment and shall not be used in contravention of pesticide product specifications or any legal or regulatory requirement. In addition, specific to pollinators, the United Republic of Tanzania provides that pesticide spraying during the daytime is prohibited within seven km of an apiary.

3.1.9 Zambia

The legal framework for protecting pollinators from pesticides in Zambia is primarily concentrated in provisions found in the environmental management domain and the animal health domain. With respect to

Summary: The following elements have observed in the laws and regulations of Zambia which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pesticide bans and severe restrictions	Provide for the affirmative listing of pesticides that are banned because of potential harm to pollinators.
Location	Beekeeper registration	Require keepers of managed pollinators to submit information about the location of their activities.
Use	Restrictive orders	Provide competent authorities with the power to restrict activities to reduce the likelihood of pesticide impacts on pollinators.
Effects	Pesticide effects monitoring	Require active monitoring for unintended or adverse effects of pesticide use on pollinators.

environmental management, the relevant legal framework is anchored by the *Environmental Management Act, 2011 (2013)* and its subsidiary regulation, the *Environmental Management (Licensing) Regulations, 2013 (2013)*. Both contain dedicated parts on pesticides. With respect to animal health, the relevant legal framework is anchored by the *Animal Health Act, 2010 (2010)* and its subsidiary regulation, the *Animal Health (Bee Keeping) Regulations, 2020 (2020)*.

Relevant legal provisions in Zambia cover a range of aspects of protecting pollinators from pesticides. Thus, in Zambia, the competent Minister may ban, severely restrict, or restrict the use of product of pesticides

likely to be harmful to animal life or the environment, and the banned pesticide shall be published in a newspaper of general circulation within seven days. Unlike the prior system under the repealed Environment Protection and Pollution Control Act (1990) and repealed subsidiary Pesticides and Toxic Substances Regulations (1994), Zambia’s current Environmental Management Act (2011) and its subsidiary Environmental Management (Licensing) Regulations (2013) do not specifically include a pesticide registration requirement. The current framework focuses on licensing of activities related to pesticides, including “to manufacture, import, export, store, distribute, transport, blend, process, re-process or change the composition of a pesticide or toxic substance or who intends to reprocess an existing pesticide or toxic substance for a significantly new use,” but registration of pesticides is absent. Note that, although not strictly part of a pesticide registration requirement, Zambia does require providing information about toxicity to bees as part of its form to apply for a licence to conduct pesticide related activities.

In Zambia, beekeepers are required to seek a permit from the government, and the procedure for applying for a permit is specified in regulations. Thus, the competent authorities for pesticides in the United Republic of Tanzania and Zambia have the power to issue an order to restrict pesticide usage when there are reasonable grounds to believe that the use of a pesticide is likely to cause damage to animals or the environment more generally; failure to comply with such an order is made an offence. Zambia provides that the competent government authority shall collect data on the use of pesticides and effects on the environment, as well as the presence of pesticides in the environment.

3.1.10 Zimbabwe

The legal framework for protecting pollinators from pesticides in Zimbabwe is primarily concentrated in provisions found in the beekeeping domain and the pesticide domain. With respect to beekeeping, the

Summary: The following elements have observed in the laws and regulations of Zimbabwe which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Location	Managed pollinator zones	Declare areas where apiaries will benefit from special protections from the effects of pesticide use.
Use	Pesticide use notice	Require that advance notice be provided to managers of pollinators prior to the application of potentially harmful pesticides.
Use	Restrictive orders	Provide competent authorities with the power to restrict activities to reduce the likelihood of pesticide impacts on pollinators.

relevant legal framework is anchored by the *Bees Act, 1973 (2002)*. With respect to pesticides, the relevant legal framework is anchored by the *Fertilizers, Farm Feeds and Remedies Act, 1952 (2001)* and its subsidiary regulation, the *Pesticides Regulations, 2012 (2012)*.

Relevant legal provisions in Zimbabwe are primarily focused on reducing risks to pollinators from how and where pesticides are applied. Thus, Zimbabwe’s application for pesticide registration includes a space for

providing information about toxicology and hazards to wildlife, but no further details are provided. In Zimbabwe, a local conservation committee may recommend the declaration of a specified area if it determines that pesticide use in the area concerned is likely to be harmful to bees. Once a specified area has been declared, beekeepers with apiaries in that specified area will benefit from special notification rules for when pesticides are to be applied nearby. Zimbabwe prescribes a system of advance notice of pesticide application for beekeepers located in specified areas. Thus, a beekeeper located in a specified area may write to local land occupiers within five km of an apiary, with copy to the local conservation committee, to inform them of their need to receive advance notice of forty-eight hours before pesticides are applied, as well as to receive advance information about what pesticide is to be applied and how. After a land owner receives notice from a beekeeper, the land owner is then obligated to provide this advance notice to the beekeeper before applying pesticides, with copy to the local conservation committee. Failure to comply with these notification requirements is subject to monetary penalties or imprisonment. The competent authority for beekeeping in Zimbabwe has the power to issue an order restricting the keeping of bees in any area where premises are unsuitable for beekeeping.

3.2. Reference countries

3.2.1. Australia (New South Wales)

The legal framework for protecting pollinators from pesticides in Australia is primarily concentrated in provisions found in the pesticide domain, split between the national level and the state level. With respect to the federal level, the relevant legal framework is anchored by the *Agricultural and Veterinary Chemicals Code Act, 1994 (2016)*, supported by the *Agricultural and Veterinary Chemicals Code Regulations, 1995 (2020)*. At the state level in New South Wales, the relevant legal framework is anchored by the *New South Wales Pesticides Act, 1999 (2020)*, and supported by the *New South Wales Pesticides Regulation, 2017 (2020)*.

Relevant legal provisions in Australia cover a range of aspects of protecting pollinators from pesticides. In Australia, pesticides must meet safety criteria in order to be approved and registered, including that it would not likely have an unintended effect that is harmful to animals, plants, or things or to the environment. Australia requires testing the toxicity of products in relation to relevant organisms and ecosystems.

Pesticide labels in Australia are required to comply with the Agricultural Labelling Code, which requires specific information and instructions necessary for the protection of honeybees and other insect pollinators. If the Environment Protection Authority in New South Wales, Australia suspects that pesticides are being used in an environmentally unsatisfactory manner, the Authority may direct a pesticide user to change how the pesticides are being used, to restrict or stop pesticide use, or require other measures such as further notification to affected parties or developing and implementing a plan to reduce environmental impacts; failure to comply with the directions of the Authority is made an offence subject to monetary penalties. Australia accomplishes a similar function by explicitly requiring each pesticide user to read each pesticide label before each use, to comply with all provisions on the label, and then requiring the inclusion of instructions to prevent harm to pollinators on the label.

Holders of pesticide registrations in Australia are required to report to the competent authority any new

Summary: The following elements have observed in the laws and regulations of Australia (New South Wales) which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pesticide registration criteria	Require consideration of effects on pollinators when approving or rejecting a pesticide.
Product	Pollinator toxicity testing	Require testing for toxicity to pollinators as a part of pesticide registration requirements
Use	Pesticide labels	Require that pesticide labels contain information about potential hazards to pollinators and/or precautions to mitigate hazards to pollinators.
Use	Restrictive orders	Provide competent authorities with the power to restrict activities to reduce the likelihood of pesticide impacts on pollinators.
Use	Pesticide use rules	Require that pesticide users take steps to protect pollinators from harm when applying pesticides.
Effects	Liability for harm to pollinators	Define causes of action or civil penalties for causing harm to pollinators with pesticides
Effects	Adverse effects disclosure	Require reporting of observed unintended effects of pesticides on pollinators.
Effects	Pesticide registration revocation	Provide a pathway to cancel a pesticide's registration in light of new information about the pesticide's effects on pollinators.

information about the registered project, and failure to report is subject to monetary penalties. If it becomes clear that a registered pesticide does not meet safety criteria (see above under Pesticide Registration Criteria), then the competent authority in Australia may suspend or cancel the pesticide's registration and order a recall of the pesticide. In the state of New South Wales in Australia, specific offences with monetary penalties are prescribed for willfully or negligently using a pesticide in a manner that harms any non-target animal.

3.2.2 China

The legal framework for protecting pollinators from pesticides in China is primarily concentrated in provisions found in the pesticide domain. The relevant legal framework is anchored by the *Regulations on the Management of Pesticides, 2017* (2017). These regulations are further supported by a suite of administrative measures and ministerial announcements, including for example, *Administrative Measures for the Registration of Pesticides, 2017* (2018), *MoA Announcement 2569 - Data Requirements on Pesticide Registration, 2017* (2017), and the *Administrative Measures for the Labels and Manuals of Pesticides, 2017* (2017).

Summary: The following elements have observed in the laws and regulations of China which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pesticide registration criteria	Require consideration of effects on pollinators when approving or rejecting a pesticide.
Product	Pollinator toxicity testing	Require testing for toxicity to pollinators as a part of pesticide registration requirements
Product	Pesticide bans and severe restrictions	Provide for the affirmative listing of pesticides that are banned because of potential harm to pollinators.
Use	Pesticide labels	Require that pesticide labels contain information about potential hazards to pollinators and/or precautions to mitigate hazards to pollinators.
Use	Pesticide use rules	Require that pesticide users take steps to protect pollinators from harm when applying pesticides.
Use	IPM or pesticide risk/use reduction planning	Require integrated planning or other similar measures to reduce the overall use of pesticides or the impact of pesticides on pollinators.
Effect	Pesticide effects monitoring	Require active monitoring for unintended or adverse effects of pesticide use on pollinators.
Effects	Adverse effects disclosure	Require reporting of observed unintended effects of pesticides on pollinators.
Effects	Pesticide registration revocation	Provide a pathway to cancel a pesticide's registration in light of new information about the pesticide's effects on pollinators.

Relevant legal provisions in China cover a range of aspects of protecting pollinators from pesticides. China's regulations prescribe that toxicology and environmental impact must be considered by the competent government authority when deciding whether to register a pesticide, and the regulations encourage the phase out of pesticides with risks to animal safety and the environment. China's regulations specify in detail the toxicity testing results that must accompany applications to register a new pesticide, and this includes acute toxicity test data for honeybees. China provides that the Ministry of Agriculture shall publish and periodically adjust a list of prohibited pesticides, makes it an offence with monetary penalties to use prohibited pesticides.

In China, the government is mandated to gradually reduce the use of pesticides in favor of biological controls, physical controls, improved equipment, and other measures. Furthermore, county-level governments in China are required to make and implement plans to reduce pesticide use and encourage pesticide users to voluntarily reduce the volume of pesticides used.

It is required to clearly state on pesticide labels any likely adverse impacts on beneficial organisms (such as bees) and the environment more generally, as well as preventive measures to alleviate such impacts. In China, pesticide users are required to protect beneficial organisms and environment when applying pesticides, and agricultural and environmental authorities are mandated to strengthen guidelines for users to govern the application of pesticides and to prevent pollution.

China requires provincial agricultural departments to establish pesticide safety risk management systems to monitor on an ongoing basis the impacts of pesticide use, including impacts on non-target organisms (including bees) and the environment; provincial departments are then required to report monitoring results to the central Ministry of Agriculture. Pesticide users, dealers, and producers in China are all obligated to immediately report to local agricultural authorities when they discover new information that a pesticide poses serious harm or a significant risk to animals or the ecological environment. In China, the competent authority shall organize a pesticide registration review committee to review information about a pesticide's adverse effects to animals or the environment; after the review, the committee may decide to forbid or restrict the use of the pesticide and then publicize the decision to the public.

3.2.3. Ireland (European Union)

The legal framework for protecting pollinators from pesticides in Ireland is primarily concentrated in provisions found in the pesticide domain. The relevant legal framework includes domestic Irish legislation and European legislation. At the Irish level, key instruments include *S.I. No. 159/2012 - European Communities (Plant Protection Products) Regulations, 2012 (2012)* and *S.I. No. 155/2012 - European Communities (Sustainable Use of Pesticides) Regulations, 2012 (2012)*. At the European level, there is a very detailed regulatory framework. Key instruments at the top of the hierarchy include *Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides, 2009 (2019)* and *Regulation (EC) No. 1107/2009 of the European Parliament and of the Council of 21 October 2009 Concerning the Placing of Plant Protection Products on the Market and Repealing Council Directives 79/117/EEC and 91/414/EEC, 2009 (2021)*. Regulation (EC) No. 1107/2009 is supported by a suite of implementing regulations, including for example, *Commission Regulation (European Union) No 547/2011 of 8 June 2011 implementing Regulation (EC) No 1107/2009 of the European Parliament and of the Council as regards labelling requirements for plant protection products, 2011 (2013)*.

Relevant legal provisions in Ireland cover a range of aspects of protecting pollinators from pesticides. Thus, in Ireland, per European Union requirements, pesticides must have no unacceptable effects on the environment, including non-target species, biodiversity, or ecosystems. European requirements are extensive and detailed when it comes to requirements to conduct testing for effects on arthropods, including specific provisions on testing for effects on bees. As a member of the European Union, Ireland like other member countries utilizes a process where a country (rapporteur) initially compiles a risk assessment which is then reviewed by the European Food Safety Authority. The assessment is based on a suite of standardized toxicity and exposure tests. Regarding pesticide bans, recent actions in the European Union with respect to certain neonicotinoids, have tended to focus on authorization status and use restrictions.ⁱ European mem-

ⁱ See e.g., European Union. Commission Implementing Regulation (European Union) 2018/783 of 29 May 2018 amending Implementing Regulation (European Union) No 540/2011 as regards the conditions

Summary: The following elements have observed in the laws and regulations of Ireland (including applicable European Union legislation) which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pesticide registration criteria	Require consideration of effects on pollinators when approving or rejecting a pesticide.
Product	Pollinator toxicity testing	Require testing for toxicity to pollinators as a part of pesticide registration requirements
Use	Restrictive orders	Provide competent authorities with the power to restrict activities to reduce the likelihood of pesticide impacts on pollinators.
Use	Pesticide use rules	Require that pesticide users take steps to protect pollinators from harm when applying pesticides.
Use	Pesticide labels	Require that pesticide labels contain information about potential hazards to pollinators and/or precautions to mitigate hazards to pollinators.
Use	IPM or pesticide risk/use reduction planning	Require integrated planning or other similar measures to reduce the overall use of pesticides or the impact of pesticides on pollinators.
Effects	Pesticide registration revocation	Provide a pathway to cancel a pesticide's registration in light of new information about the pesticide's effects on pollinators.
Effects	Adverse effects disclosure	Require reporting of observed unintended effects of pesticides on pollinators.

ber states are further required to take all necessary measures to promote low pesticide-input pest management, including integrated pest management.

European requirements for pesticide labels are extremely detailed, and include specific safety precaution language related to managing effects on pollinating insects. In Ireland, authorized officers are given the power to issue a compliance notice restrict pesticide use or the manner in which pesticides are used when the officer has reasonable grounds to suspect that pesticide use would damage animal health or welfare or the environment. Pesticide users in Ireland are required to apply good practice principles published by the competent authority, which include, for example, that pesticides used should have the least possible side effects on non-target organisms and the environment.

of approval of the active substance imidacloprid, 2018.

Europe requires that the holder of a pesticide authorization must immediately notify the competent authority of the Member State that granted the authorization when the holder becomes aware of potentially harmful effects on animal health or the environment. In Europe, the relevant competent authority may withdraw or amend a pesticide's approval if it considers that the pesticide no longer satisfies its approval criteria.

3.2.4. United States of America (California)

The legal framework for protecting pollinators from pesticides in the United States of America is primarily concentrated in provisions found in the pesticide domain and the agriculture domain. Regulations prescribe that toxicology and environmental impact must be considered by the competent government authority when deciding whether to register a pesticide. Relevant provisions are found in both federal-level legislation and state-level legislation. For the purposes of this summary, provisions in the state of California are in focus. At the federal level, the relevant legal framework is anchored by the *Federal Insecticide, Fungicide, and Rodenticide Act, 1947 (2019)*, and its supporting regulations found under *Title 40, Chapter I, Subchapter E - Pesticide Programs, of the Code of Federal Regulations, 1970 (2021)*. At the state level in California, the relevant legal framework is anchored by the *California Food and Agricultural Code (especially Divisions 6, 7, and 13)* and supporting regulations found in the *California Code of Regulations (especially Title 3, Division 6 - Pesticides and Pest Control Operations)*.

Relevant legal provisions in the United States of America cover a range of aspects of protecting pollinators from pesticides. Thus, at the federal level, the Administrator of the United States Environmental Protection Agency responsible for registering pesticides may register a pesticide if, among other factors and subject to any prescribed conditions, it will perform its intended function with no unreasonable adverse effects on the environment and when used in accordance with widespread and commonly recognized practice it will not generally cause unreasonable adverse effects on the environment. In the state of California, regulations prescribe that any registration application for a pesticide likely to contact pollinating bees must include testing data for acute toxicity to bees.

Regulations in California prescribe the creation of bee protection areas surrounding citrus groves in certain regions of the state. Beekeepers within bee protection areas benefit from special notification rules for when pesticides are to be applied nearby. In California, beekeepers are required to register with designated local officials the locations of their apiaries at the beginning of each year, and failure to register is made an offence. At the federal level, legislation promotes integrated pest management by directing the competent government authority to implement research, demonstration, and education programs on the topic, and directing federal agencies to apply integrated pest management in their own pest management activities.

At the federal level, the United States Environmental Protection Agency may require that a pesticide's label contain statements about hazards to non-target organisms such as pollinating insects, and appropriate precautions to avoid such hazards. Pesticide labels in the United States of America comply with requirements under *Title 40, Chapter 1, Subchapter E, Part 156 Labeling Requirements for Pesticides and Devices (2021)* with additional guidance provided in the Label Review Manual which provides specific information and instructions necessary for the protection of honeybees and other insect pollinators.

Summary: The following elements have observed in the laws and regulations of the United States of America (including the laws and regulations of California as a selected state) which can directly or indirectly support actions to protect pollinators from adverse effects of pesticide use.

Thematic area	Element	Description
Product	Pesticide registration criteria	Require consideration of effects on pollinators when approving or rejecting a pesticide.
Product	Pollinator toxicity testing	Require testing for toxicity to pollinators as a part of pesticide registration requirements
Location	Managed pollinator zones	Declare areas where apiaries will benefit from special protections from the effects of pesticide use.
Location	Beekeeper registration	Require keepers of managed pollinators to submit information about the location of their activities.
Use	Pesticide labels	Require that pesticide labels contain information about potential hazards to pollinators and/or precautions to mitigate hazards to pollinators.
Use	Restrictive orders	Provide competent authorities with the power to restrict activities to reduce the likelihood of pesticide impacts on pollinators.
Use	Pesticide use notice	Require that advance notice be provided to managers of pollinators prior to the application of potentially harmful pesticides.
Use	Pesticide use rules	Require that pesticide users take steps to protect pollinators from harm when applying pesticides.
Use	IPM or pesticide risk/use reduction planning	Require integrated planning or other similar measures to reduce the overall use of pesticides or the impact of pesticides on pollinators.
Effects	Adverse effects disclosure	Require reporting of observed unintended effects of pesticides on pollinators.
Effects	Liability for harm to pollinators	Define causes of action or civil penalties for causing harm to pollinators with pesticides.
Effects	Pesticide registration revocation	Require integrated planning or other similar measures to reduce the overall use of pesticides or the impact of pesticides on pollinators.
Effects	Pesticide effects monitoring	Require reporting of observed unintended effects of pesticides on pollinators.

California grants power to the state's competent authority to promulgate specific pesticide use rules to protect bees. Beekeepers are required to notify the local government authority of the presence of their apiaries for the purposes of pesticide application notifications. For better coordination across local boundaries, the competent government authority is also given the power to establish regions spanning local government boundaries wherein advance notice of pesticide applications will be given to beekeepers. A person intending to apply pesticides that are potentially harmful to bees must first inquire with the local authority and provide advance notice of at least forty-eight hours to any beekeepers that have notified the local authority. The advance notice must include "the time and place the application is to be made, the crop and acreage to be treated, the method of application, the identity and application rate of the pesticide to be applied and how the person performing pest control may be contacted by the beekeeper."

In California, the competent authority responsible for pesticides is given the power to order pesticide users to cease and desist from an activity that is likely to present an immediate hazard or cause irreparable damage. Pesticide users in California are required to exercise reasonable precautions to avoid contamination of the environment, and no pesticides may be applied when there is a reasonable possibility of damage to nontarget species. California grants power to the state's competent authority to promulgate specific pesticide use rules to protect bees.

At the federal level, the competent authority must develop and implement a national pesticide monitoring plan, including monitoring of incidental exposure of animals to pesticides and environmental pesticide pollution. At the federal level, the holder of a pesticide registration must notify the competent government authority about any new or additional factual information regarding a registered pesticide's unreasonable adverse effects on the environment. Subsidiary regulations further specify in detail the information about adverse effects which must be reported. At the federal level, the competent authority may cancel a pesticide's registration and require a product recall if the pesticide, when used in accordance with common practice, causes unreasonable adverse effects on the environment. In California, beekeepers may bring an action to recover compensation for damages from nearby pesticide use, as long as they have complied with all requirements regarding registration of apiaries and requesting notice in advance of pesticide use.

Concluding remarks

Even though at least seventeen different legal elements have been observed which can theoretically be used directly or indirectly to support actions to protect pollinators from adverse effects caused by the use of pesticides, most of these elements are not widespread among the focus countries. Among the focus countries, only Rwanda and the United Republic of Tanzania currently have a relative comprehensive set of elements present in their legal frameworks and available at their disposal to support the protection of pollinators.

Instead, the set of legal elements currently available to most focus countries is much narrower and focused on pesticide registration requirements. Thus, most of the focus countries have available in their legal frameworks at least one or more product-focused elements that can be used to help support efforts to reduce the likelihood that pesticides on the market have properties that are toxic to pollinators, whether it be through requiring the competent authority to consider effects on pollinators when authorizing or registering a pesticide for use in the country, requiring testing for toxicity to pollinators as a part of pesticide registration requirements, or providing for the affirmative listing of pesticides that are banned or severely restricted because of potential harm to pollinators. Such product-focused elements also receive much of the attention in the legal frameworks of the studied reference countries.

For a typical focus country seeking to strengthen its legal framework to better protect pollinators from adverse effects caused by the use of pesticides, there are at least two possible starting points to consider when it comes to initial studies and reform dialogues. First, a focus country may seek to evaluate whether they are currently maximizing the use of elements currently available to them in their legal framework, particularly in their legal requirements surrounding pesticide product registration. For example, are current requirements for pesticide registration, pesticide testing, and pesticide bans currently being actively used by regulators to keep risky pesticides out of the market? Second, a focus country may wish to explore whether a broader range of legal elements could be introduced to support that country's policy objectives for protecting pollinators from pesticides. For most focus countries, this will entail evaluating whether any of the location-focused elements, use-focused elements, or effects-focused elements discussed above could provide desired support to policy objectives or ongoing or planned activities related to pollinator protection.

Notes

- ¹ **United Republic of Tanzania.** 1998. *Plant Protection Regulations*, Reg. 27.
- ² **Rwanda.** 2012. *Law No. 30/2012 of 01/08/2012 on Governing of Agrochemicals*, Art. 13; **Rwanda.** 2016. *Ministerial Order No. 002/11.30 of 14/07/2016 Determining Regulations Governing Agrochemicals*, Art. 15.
- ³ **Kenya.** 1984. *Pest Control Products (Registration) Regulations*, Reg. 10.
- ⁴ **ECOWAS.** 2008. *Regulation C/REG.3/05/2008 on Harmonization of the Rules Governing Pesticides Registration in ECOWAS Region*, Art. 16.
- ⁵ **CILSS.** 1999. *Regulations Common to CILSS Member States on the Approval of Pesticides*, Art. 11-12.
- ⁶ **Dominica.** 1987. *Pesticides Control (Registration and Licensing) Regulations*, Reg. 6.
- ⁷ **Samoa.** 2011. *Pesticides Regulations*, Reg. 13.
- ⁸ **China.** 2017. *Administrative Measures for the Registration of Pesticides*, Art. 6.
- ⁹ **Australia.** 1994. *Agricultural and Veterinary Chemicals Code Act*, Sec. 5A, 14.
- ¹⁰ **United States of America.** 1947. *Federal Insecticide, Fungicide, and Rodenticide Act*, Sec. 7 U.S.C. 136a(c)(5); **United States of America.** 1970. *Code of Federal Regulations*, Title 40, Chapter I, Subchapter E - Pesticide Programs, Reg. 40 C.F.R. 152.112.
- ¹¹ **European Union.** 2009. *Regulation (EC) No. 1107/2009 of the European Parliament and of the Council of 21 October 2009 Concerning the Placing of Plant Protection Products on the Market and Repealing Council Directives 79/117/EEC and 91/414/EEC*, Art. 4.
- ¹² **European Union.** 2011. *Commission Regulation (European Union) No 546/2011 of 10 June 2011 implementing Regulation (EC) No 1107/2009 of the European Parliament and of the Council as regards uniform principles for evaluation and authorization of plant protection products*, Art. 2.5.2.3; **United States Environmental Protection Agency.** 2014. *Guidance for Assessing Pesticide Risks to Bees*, United States Environmental Protection Agency, Washington DC.
https://www.epa.gov/sites/default/files/2014-06/documents/pollinator_risk_assessment_guidance_06_19_14.pdf
- ¹³ **Kenya.** 1984. *Pest Control Products (Registration) Regulations*, Second Schedule, Form A; **Saint Lucia.** 1987. *Pesticides Control (Registration and Licensing) Regulations*, S.I. No. 71, Schedule, Form A-1.
- ¹⁴ **CILSS.** 1999. *Regulations Common to CILSS Member States on the Approval of Pesticides*, Annex 2.
- ¹⁵ **Dominica.** 1987. *Pesticides Control (Registration and Licensing) Regulations*, Reg. 3.
- ¹⁶ **Solomon Islands.** 1983. *Safety at Work (Pesticide) Regulations*, Reg. 3, Annex 2.
- ¹⁷ **China.** 2017. *Ministry of Agriculture Announcement 2569 - Data Requirements on Pesticide Registration*, Chapters 3, 4, 6, and 7.
- ¹⁸ **Australia.** 1994. *Agricultural and Veterinary Chemicals Code Act*, Sec. 5A.
- ¹⁹ **California, United States of America.** *California Code of Regulations*, Title 3, Division 6 - Pesticides and Pest Control Operations, Reg. 3 C.C.R. 6187.
- ²⁰ **European Union.** 2013. *Commission Regulation (European Union) No 284/2013 of 1 March 2013 setting out the data requirements for plant protection products, in accordance with Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market*, Annex Part A, Sec. 10.3.
- ²¹ **United Republic of Tanzania.** 2020. *Plant Health Act*, Sec. 18, 52.
- ²² **Rwanda.** 2012. *Law No. 30/2012 of 01/08/2012 on Governing of Agrochemicals*, Art. 16; **Rwanda.** 2016. *Ministerial Order No. 002/11.30 of 14/07/2016 Determining Regulations Governing Agrochemicals*, Art. 4, Annex 1.
- ²³ **Zambia.** 2013. *Environmental Management (Licensing) Regulations*, 2013, Reg. 40.
- ²⁴ **CILSS.** 1999. Article 27, *Regulations Common to CILSS Member States on the Approval of Pesticides*, 1999, Art. 27; **ECOWAS.** 2008. *Regulation C/REG.3/05/2008 on Harmonization of the Rules Governing Pesticides Registration in ECOWAS Region*, Art. 10.
- ²⁵ **Saint Lucia.** 2001. *Pesticides and Toxic Chemical Control Act*, Sec. 24, Schedule 4.
- ²⁶ **Dominica.** 1974. *Pesticides Control Act*, Sec. 7; **Dominica.** 2020. *Pesticides Control (Prohibition) Regulations*, Reg. 3.

- ²⁷ **China**. 2017. *Regulations on the Management of Pesticides*, 2017, Art. 34, 60; **China**. *Administrative Measures for the Registration of Pesticides*, Art. 9.
- ²⁸ **European Union**. 2018. *Commission Implementing Regulation (European Union) 2018/783 of 29 May 2018 amending Implementing Regulation (European Union) No 540/2011 as regards the conditions of approval of the active substance imidacloprid*.
- ²⁹ **United Republic of Tanzania**. 2002. *Beekeeping Act*, Sec. 13-15; 12-18.
- ³⁰ **United Republic of Tanzania**. 2002. *Beekeeping Act*, Sec. 11.
- ³¹ **United Republic of Tanzania**. 2002. *Beekeeping Act*, Sec. 16, 18.
- ³² **United Republic of Tanzania**. 2002. *Beekeeping Act*, Sec. 17.
- ³³ **United Republic of Tanzania**. 2002. *Beekeeping Act*, Sec. 23.
- ³⁴ **United Republic of Tanzania**. 2002. *Beekeeping Act*, Sec. 23-25.
- ³⁵ **United Republic of Tanzania**. 2002. *Beekeeping Act*, Sec. 26.
- ³⁶ **Zimbabwe**. 1973. *Bees Act*, Sec. 14.
- ³⁷ **Zimbabwe**. 1973. *Bees Act*, Sec. 15.
- ³⁸ **California, United States of America**. *California Code of Regulations*, Title 3, Division 6 - Pesticides and Pest Control Operations, Reg. 3 C.C.R. 6656.
- ³⁹ **California, United States of America**. *California Code of Regulations*, Title 3, Division 6 - Pesticides and Pest Control Operations, Reg. 3 C.C.R. 6656.
- ⁴⁰ **United Republic of Tanzania**. 2002. *Beekeeping Act*, Sec. 27.
- ⁴¹ **United Republic of Tanzania**. 2005. *Beekeeping (General) Regulations*, Reg. 11-12.
- ⁴² **United Republic of Tanzania**. 2005. *Beekeeping (General) Regulations*, Reg. 9.
- ⁴³ **Rwanda**. 2014. *Ministerial Instructions N. 001/MINAGRI/014 of 10/12/2014 Relating to Positioning of Beehives, Honey Harvesting Equipment and Issuance of Beekeeping Certificate*, Art. 7, 11.
- ⁴⁴ **Rwanda**. 2014. *Ministerial Instructions N. 001/MINAGRI/014 of 10/12/2014 Relating to Positioning of Beehives, Honey Harvesting Equipment and Issuance of Beekeeping Certificate*, Art. 10.
- ⁴⁵ **Zambia**. 2010. *Animal Health Act*, Sec. 56; **Zambia**. 2020. *Animal Health (Bee Keeping) Regulations*, Reg. 4; 6-9.
- ⁴⁶ **California, United States of America**. *California Food and Agricultural Code - Division 13 - Bee Management and Honey Production*, Sec. 29040, 29045.
- ⁴⁷ **United Republic of Tanzania**. 2005. *Beekeeping (General) Regulations*, Reg. 4, 6.
- ⁴⁸ **United Republic of Tanzania**. 2005. *Beekeeping (General) Regulations*, Reg. 4.
- ⁴⁹ **United Republic of Tanzania**. 2002. *Beekeeping Act*, Sec. 26.
- ⁵⁰ **Rwanda**. 2019. *Ministerial Order No. 001/2019 of 15/04/2019 Establishing the List of Projects that Must Undergo Environmental Impact Assessment, Instructions, Requirements and Procedures to Conduct Environmental Impact Assessment*, Annex 1.
- ⁵¹ **Niger**. 2000. *Decree No. 2000-398/PRN/ME/LCD Determining Activities, Works and Planning Documents Subject to Environmental Impact Assessment*, Art. 1.
- ⁵² **Solomon Islands**. 1998. *Environment Act*, Sec. 16, 17., Second Schedule.
- ⁵³ **Rwanda**. 2016. *Ministerial Order No. 002/11.30 of 14/07/2016 Determining Regulations Governing Agrochemicals*, Art. 39.
- ⁵⁴ **Kenya**. 1984. *Pest Control Products (Labelling, Advertising And Packaging) Regulations*, Reg. 3.
- ⁵⁵ **Saint Lucia**. 1987. *Pesticides Control (Labelling of Pesticides) Regulations*, S.I. No. 70, Reg. 3; **Dominica**. 1987. *Pesticides Control (Labelling of Pesticides) Regulations*, Reg. 4.
- ⁵⁶ **China**. 2017. *Administrative Measures for the Labels and Manuals of Pesticides*, Art. 17.
- ⁵⁷ **Australia**. 1995. *Agricultural and Veterinary Chemicals Code Regulations*, Reg. 18E; **Australia**. 2013. *Agricultural Labelling Code*, Sec. 18.4.3.
- ⁵⁸ **United States of America**. 1970. *Code of Federal Regulations*, Title 40, Chapter I, Subchapter E - Pesticide Programs, Reg. 40 C.F.R. 156.80 and 40 C.F.R. 156.85.
- ⁵⁹ **European Union**. 2011. *Commission Regulation (European Union) No 547/2011 of 8 June 2011 implementing Regulation (EC) No 1107/2009 of the European Parliament and of the Council as regards labelling requirements for plant protection products*, Article 1, Annex III.
- ⁶⁰ **United Republic of Tanzania**. 2005. *Beekeeping (General) Regulations*, Reg. 4.
- ⁶¹ **Zimbabwe**. 1973. *Bees Act*, Sec. 15.
- ⁶² **Zimbabwe**. 1973. *Bees Act*, Sec. 15.
- ⁶³ **Zimbabwe**. 1973. *Bees Act*, Sec. 16.
- ⁶⁴ **Zimbabwe**. 1973. *Bees Act*, Sec. 15-16.

- ⁶⁵ **United Republic of Tanzania.** 2020. *Plant Health Act*, Sec. 54; **Zambia.** 2011. *Environmental Management Act*, Sec. 103-104; **Zambia.** 2013. *Environmental Management (Licensing) Regulations*, Reg. 65-66.
- ⁶⁶ **United Republic of Tanzania.** 2002. *Beekeeping Act*, Sec. 28; **Zimbabwe.** 1973. *Bees Act*, Sec. 12.
- ⁶⁷ **New South Wales, Australia.** 1999. *New South Wales Pesticides Act*, Sec. 23-25.
- ⁶⁸ **California, United States of America.** *California Food and Agricultural Code*, Division 7 - Agricultural Chemicals, Livestock Remedies and Commercial Feeds, Sec. 13101-13102.
- ⁶⁹ **Ireland.** 2012. *European Communities (Plant Protection Products) Regulations*, S.I. No. 159/2012, Reg. 21; **Ireland.** 2012. *European Communities (Sustainable Use of Pesticides) Regulations*, S.I. No. 155/2012, Reg. 19.
- ⁷⁰ **United Republic of Tanzania.** 2020. *Plant Health Act*, Sec. 20.
- ⁷¹ **United Republic of Tanzania.** 2005. *Beekeeping (General) Regulations*, Reg. 4.
- ⁷² **Rwanda.** 2014. *Ministerial Order N. 001/11.30 of 10/12/2014 Relating to Hygiene in Beekeeping and Modalities for Use of Toxic Substances*, Art. 19-21.
- ⁷³ **China.** 2017. *Regulations on the Management of Pesticides*, Art. 30, 35.
- ⁷⁴ **New South Wales, Australia.** 1999. *New South Wales Pesticides Act*, Sec. 14-15; **Australia.** 1995 (2020). *Agricultural and Veterinary Chemicals Code Regulations*, Reg. 18E; **Australia.** 2013. *Agricultural Labelling Code*, Sec. 18.4.3.
- ⁷⁵ **California, United States of America.** *California Code of Regulations*, Title 3, Division 6 - Pesticides and Pest Control Operations, Reg. 3 C.C.R. 6600 and 3 C.C.R. 6614.
- ⁷⁶ **California, United States of America.** *California Food and Agricultural Code*, Division 13 - Bee Management and Honey Production, Sec. 29102.
- ⁷⁷ **Ireland.** 2012. *European Communities (Sustainable Use of Pesticides) Regulations*, S.I. No. 155/2012, Reg. 15; **Irish Department of Agriculture, Food and the Marine.** ND. *Good Plant Protection Practice*. Dublin. [https://www.pcs.agriculture.gov.ie/media/pesticides/content/sud/professional/Good%20Plant%20Protection%20Practice%20\(GPPP\).pdf](https://www.pcs.agriculture.gov.ie/media/pesticides/content/sud/professional/Good%20Plant%20Protection%20Practice%20(GPPP).pdf)
- ⁷⁸ **United Republic of Tanzania.** 2020. *Plant Health Act*, Sec. 5.
- ⁷⁹ **China.** 2017. *Regulations on the Management of Pesticides*, Art. 32.
- ⁸⁰ **China.** 2017. *Regulations on the Management of Pesticides*, Art. 32.
- ⁸¹ **United States of America.** 1947. *Federal Insecticide, Fungicide, and Rodenticide Act*, Sec. 7 U.S.C. 136r-1.
- ⁸² **European Union.** 2009. *Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides*, Art. 4.
- ⁸³ **European Union.** 2009. *Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides*, Art. 14, Annex III.
- ⁸⁴ **Rwanda.** 2012. *Law No. 30/2012 of 01/08/2012 on Governing of Agrochemicals*, Art. 22.
- ⁸⁵ **Zambia.** 2011. *Environmental Management Act*, Sec. 66.
- ⁸⁶ **China.** 2017. *Regulations on the Management of Pesticides*, Art. 43; **China.** 2017. *Administrative Measures for the Registration of Pesticides*, Art. 33-34.
- ⁸⁷ **United States of America.** 1947. *Federal Insecticide, Fungicide, and Rodenticide Act*, Sec. 7 U.S.C. 136r.
- ⁸⁸ **China.** 2017. *Regulations on the Management of Pesticides*, Art. 42.
- ⁸⁹ **United States of America.** 1947. *Federal Insecticide, Fungicide, and Rodenticide Act*, 7 U.S.C. 136d.
- ⁹⁰ **United States of America.** 1970. *Code of Federal Regulations*, Title 40, Chapter I, Subchapter E - Pesticide Programs, Reg. 40 C.F.R. 159.184.
- ⁹¹ **Australia.** 1994. *Agricultural and Veterinary Chemicals Code Act*, Sec. 161.
- ⁹² **European Union.** 2009. *Regulation (EC) No. 1107/2009 of the European Parliament and of the Council of 21 October 2009 Concerning the Placing of Plant Protection Products on the Market and Repealing Council Directives 79/117/EEC and 91/414/EEC*, Art. 56.
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Saint Lucia. 1987. *Pesticides Control (Registration and Licensing) Regulations, S.I. No. 71.*

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Solomon Islands. 1983. *Safety at Work (Pesticide) Regulations.*

Solomon Islands. 1998. *Environment Act.*

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United Republic of Tanzania

United Republic of Tanzania. 1977. *Constitution of the United Republic of Tanzania.*

United Republic of Tanzania. 2002. *Beekeeping Act.*

United Republic of Tanzania. 2005. *Beekeeping (General) Regulations.*

United Republic of Tanzania. 2020. *Plant Health Act.*

United Republic of Tanzania. 1998. *Plant Protection Regulations.*

United Republic of Tanzania. 2004. *Environmental Management Act.*

United Republic of Tanzania. 2007. *Environmental Management (Soil Quality Standards) Regulations.*

United Republic of Tanzania. 2005. *Environment Impact Assessment and Audit Regulations.*

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United Republic of Tanzania. 2012. *Wildlife Conservation (Wildlife Management Areas) Regulations.*

United States of America (California)

United States of America. 1789. *Constitution of the United States of America.*

United States of America. 1947. *Federal Insecticide, Fungicide, and Rodenticide Act.*

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California, United States of America. *California Food and Agricultural Code - Division 13 - Bee Management and Honey Production, ND.*

California, United States of America. *California Food and Agricultural Code - Division 6 - Pest Control Operations, ND.*

California, United States of America. *California Code of Regulations, Title 3, Division 6 - Pesticides and Pest Control Operations, ND.*

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Zambia. 2011. *Environmental Management Act.*

Zambia. 2013. *Environmental Management (Licensing) Regulations.*

Zambia. 2010. *Animal Health Act.*

Zambia. 2020. *Animal Health (Bee Keeping) Regulations.*

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Zambia. 1994. *Pesticides and Toxic Substances Regulations (Repealed).*

Zimbabwe

Zimbabwe. 2013. *Constitution of Zimbabwe.*

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Zimbabwe. 2018. *Environmental Management (Control of Hazardous Substances) (General) Regulations.*

Zimbabwe. 2007. *Environment Management Act (Environmental Impact Assessment and Ecosystems Protection) Regulations.*

Abbreviated examples matrix

Element	Dominica	Kenya	Niger	Rwanda	Saint Lucia	Samoa	Solomon Islands	United Republic of Tanzania	Zambia	Zimbabwe	Australia	China	Ireland	United States of America
Pesticide Registration Criteria	✓	✓	✓	✓		✓		✓			✓	✓	✓	✓
Pollinator Toxicity Testing	✓	✓	✓		✓		✓				✓	✓	✓	✓
Pesticide Bans and Sever Restrictions	✓		✓	✓	✓			✓	✓			✓		
Wild Pollinator Reserve								✓						
Managed Pollinator Zones								✓		✓				✓
Beekeeper Registration				✓				✓	✓					✓
Minimum Distances								✓						
Environmental Impact Assessment			✓	✓			✓	✓			***	***	***	***
Pesticide Labels	✓	✓		✓	✓						✓	✓	✓	✓
Pesticide Use Notice								✓		✓				✓
Restrictive Orders								✓	✓	✓	✓		✓	✓
Pesticide Use Rules				✓				✓			✓	✓	✓	✓
IPM or Pesticide Risk/Use Reduction Planning								✓				✓	✓	✓
Pesticide Effects Monitoring				✓					✓			✓		✓
Adverse effects disclosure											✓	✓	✓	✓
Pesticide Registration Revocation	✓	✓	✓		✓	✓					✓	✓	✓	✓
Liability for Harm to Pollinators											✓			✓

Detailed examples matrix

Element	Dominica	Kenya	Niger	Rwanda	Saint Lucia	Samoa	Solomon Islands	United Republic of Tanzania	Zambia	Zimbabwe	Australia	China	Ireland	United States of America
Pesticide Registration Criteria	Dominica. Pesticides Control (Registration and Licensing) Regulations, 1987, Reg. 6.	Kenya. Pest Control Products (Registration) Regulations, 1984, Reg. 10.	ECOWAS. Regulation C/REG.3/05/2008 on Harmonization of the Rules Governing Pesticides Registration in ECOWAS Region, 2008, Art. 16; CILSS. Regulations Common to CILSS Member States on the Approval of Pesticides, 1999, Art. 11-12.	Rwanda. Law No. 30/2012 of 01/08/2012 on Governing of Agrochemicals, 2012, Art. 13. Rwanda. Ministerial Order No. 002/11.30 of 14/07/2016 Determining Regulations Governing Agrochemicals, 2016, Art. 15.		Samoa. Pesticides Regulations, 2011, Reg. 13.		United Republic of Tanzania. Plant Protection Regulations, 1998, Reg. 27.			Australia. Agricultural and Veterinary Chemicals Code Act, 1994, Sec. 5A, 14.	China. Administrative Measures for the Registration of Pesticides, 2017, Art. 6; China. Administrative Measures for the Registration of Pesticides, 2017, Art. 21.	European Union. Regulation (EC) No. 1107/2009, 2009, Art. 4 and Annex Part I, Sec. 2.5.2.	United States of America. Federal Insecticide, Fungicide, and Rodenticide Act, 1947, Sec. 136a(c)(5); United States of America. Code of Federal Regulations, Title 40, Chapter I, Subchapter E - Pesticide Programs, 1970, Sec. 152.112, 152.170(c), 158.
Pollinator Toxicity Testing	Dominica. Pesticides Control (Registration and Licensing) Regulations, 1987, Reg. 3.	Kenya. Pest Control Products (Registration) Regulations, 1984, Second Schedule, Form A.	CILSS. Regulations Common to CILSS Member States on the Approval of Pesticides, 1999, Annex 2.		Saint Lucia. Pesticides Control (Registration and Licensing) Regulations, S.I. No. 71, 1987 Schedule, Form A-1.		Solomon Islands. Safety at Work (Pesticide) Regulations, 1983, First Schedule.				Australia. Agricultural and Veterinary Chemicals Code Act, 1994, Sec. 5A.	China. Ministry of Agriculture Announcement 2569 - Data Requirements on Pesticide Registration, 2017, Chapters 3-7.	European Union. Regulation (EC) No. 1107/2009, 2009, Annex II; European Union. Commission Regulation (EU) No 284/2013, 2013, Annex Part A, Sec. 10.3.	California, United States of America. California Code of Regulations, Title 3, Division 6 - Pesticides and Pest Control Operations, Sec. 6187.
Pesticide Bans and Severe Restrictions	Dominica. Pesticides Control Act, 1974, Sec. 7. Dominica. Pesticides Control (Prohibition) Regulations, 2020, Reg. 3.		CILSS. Regulations Common to CILSS Member States on the Approval of Pesticides, 1999, Art. 27; ECOWAS. Regulation C/REG.3/05/2008 on Harmonization of the Rules Governing Pesticides Registration in ECOWAS Region, 2008, Art. 10.	Rwanda. Law No. 30/2012 of 01/08/2012 on Governing of Agrochemicals, 2012, Art. 16; Rwanda. Ministerial Order No. 002/11.30 of 14/07/2016 Determining Regulations Governing Agrochemicals, 2016, Art. 4 and Annex I.	Saint Lucia. Pesticides and Toxic Chemical Control Act, 2001, Sec. 24 and Schedule 4.			United Republic of Tanzania. Plant Health Act, 2020, Sec. 18; United Republic of Tanzania. Plant Health Act, 2020, Sec. 52.	Zambia. Environmental Management (Licensing) Regulations, 2013, Reg. 40.			China. Regulations on the Management of Pesticides, 2017, Art. 34, 60; China. Administrative Measures for the Registration of Pesticides, 2017, Art. 9.		

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Element	Dominica	Kenya	Niger	Rwanda	Saint Lucia	Samoa	Solomon Islands	United Republic of Tanzania	Zambia	Zimbabwe	Australia	China	Ireland	United States of America
Wild Pollinator Reserve								United Republic of Tanzania. Beekeeping Act, 2002, Sec. 11-22.						
Managed Pollinator Zones								United Republic of Tanzania. Beekeeping Act, 2002, Sec. 23-25.		Zimbabwe. Bees Act, 1973, Sec. 14.				California, United States of America. California Code of Regulations, Title 3, Division 6 - Pesticides and Pest Control Operations, Sec. 6656.
Beekeeper Registration				Rwanda. Ministerial Instructions N. 001/MINAGRI/014 of 10/12/2014, 2014, Art. 7-12.				United Republic of Tanzania. Beekeeping Act, 2002, Sec. 27; United Republic of Tanzania. Beekeeping (General) Regulations, 2005, Reg. 9-12.	Zambia. Animal Health Act, 2010, Sec. 56; Zambia. Animal Health (Bee Keeping) Regulations, 2020, Reg. 4.					California, United States of America. California Food and Agricultural Code, Division 13 - Bee Management and Honey Production, Sec. 29040 and 29045.
Minimum Distances								[United Republic of Tanzania] Regulations 4 and 6, Beekeeping (General) Regulations, 2005 (2019).						
Environmental Impact Assessment			The Niger. Decree No. 2000-398/PRN/ME/LCD Determining Activities, Works and Planning Documents Subject to Environmental Impact Assessment, 2000, Art. 1.	Rwanda. Ministerial Order No. 001/2019 of 15/04/2019 Establishing the List of Projects that Must Undergo Environmental Impact Assessment, Instructions, Requirements and Procedures to Conduct Environmental Impact Assessment, 2019, Annex I.			Solomon Islands. Environment Act, 1998, Sec. 16-17 and Second Schedule.	United Republic of Tanzania. Beekeeping Act, 2002, Sec. 26; United Republic of Tanzania. Environment Impact Assessment and Audit Regulations, 2005, First Schedule.			***Omitted from this study because of the complexity of EIA requirements in this jurisdiction.	***Omitted from this study because of the complexity of EIA requirements in this jurisdiction.	***Omitted from this study because of the complexity of EIA requirements in this jurisdiction.	***Omitted from this study because of the complexity of EIA requirements in this jurisdiction.

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Element	Dominica	Kenya	Niger	Rwanda	Saint Lucia	Samoa	Solomon Islands	United Republic of Tanzania	Zambia	Zimbabwe	Australia	China	Ireland	United States of America
Pesticide Labels	Dominica. Pesticides Control (Labelling of Pesticides) Regulations, 1987, Reg. 4.	Kenya. Pest Control Products (Labelling, Advertising and Packaging) Regulations, 1984, Reg. 3.		Rwanda. Ministerial Order No. 002/11.30 of 14/07/2016 Determining Regulations Governing Agrochemicals, 2016, Art. 39.	Saint Lucia. Pesticides Control (Labelling of Pesticides), Regulations, S.I. No. 70, 1987, Reg. 3.						Australia. Agricultural and Veterinary Chemicals Code Regulations, 1995, Reg. 18E; Australia. Agricultural Labelling Code, 2013, Sec. 18.4.3.	China. Administrative Measures for the Labels and Manuals of Pesticides, 2017, Art. 17.	European Union. Commission Regulation (EU) No 547/2011, 2011, Article 1 and Annex III.	
Pesticid Use Notice								United Republic of Tanzania. Beekeeping (General) Regulations, 2005, Reg. 4.		Zimbabwe. Bees Act, 1973, Sec. 15-16.				California, United States of America. California Food and Agricultural Code, Division 13 - Bee Management and Honey Production, Sec. 29080.5, 29101, 29102; California, United States of America. California Code of Regulations, Title 3, Division 6 - Pesticides and Pest Control Operations, Reg. 6652-6655.
Restrictive Orders								United Republic of Tanzania. Beekeeping Act, 2002, Sec. 28; United Republic of Tanzania. Plant Health Act, 2020, Sec. 54.	Zambia. Environmental Management Act, 2011, Sec. 103-104; Zambia. Environmental Management (Licensing) Regulations, 2013, Reg. 65-66.	Zimbabwe. Bees Act, 1973, Sec. 12.	New South Wales, Australia. New South Wales Pesticides Act, 1999, Sec. 23-25.		Ireland. European Communities (Plant Protection Products) Regulations, S.I. No. 159/2012, 2012, Reg. 21; Ireland. European Communities (Sustainable Use of Pesticides) Regulations, S.I. No. 155/2012, 2012, Reg. 19.	California, United States of America. California Food and Agricultural Code, Division 7 - Agricultural Chemicals, Livestock Remedies and Commercial Feeds, Sec. 13101-13102.

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Element	Dominica	Kenya	Niger	Rwanda	Saint Lucia	Samoa	Solomon Islands	United Republic of Tanzania	Zambia	Zimbabwe	Australia	China	Ireland	United States of America
Pesticide Use Rules				Rwanda. Ministerial Order N. 001/11.30 of 10/12/2014 Relating to Hygiene in Beekeeping and Modalities for Use of Toxic Substances, 2014, Art. 19-21; Rwanda. Ministerial Order No. 002/11.30 of 14/07/2016 Determining Regulations Governing Agrochemicals, 2016, Art. 50, 52.				United Republic of Tanzania. Bee-keeping (General) Regulations, 2005; Reg. 4; United Republic of Tanzania. Plant Health Act, 2020, Sec. 20.			New South Wales, Australia. New South Wales Pesticides Act, 1999, Sec. 14-15; Australia. Agricultural and Veterinary Chemicals Code Regulations, 1995; Reg. 18E; Australia. Agricultural Labeling Code, 2013, Sec. 18.4.3.	China. Regulations on the Management of Pesticides, 2017, Art. 30, 35.	Ireland. European Communities (Sustainable Use of Pesticides) Regulations, S.I. No. 155/2012, 2012, Reg. 15.	California, United States of America. California Code of Regulations, Title 3, Division 6 - Pesticides and Pest Control Operations, Reg. 6600 and 6614.
IPM or Pesticide Risk/Use Reduction Planning								United Republic of Tanzania. Plant Health Act, 2020, Sec. 5.				China. Regulations on the Management of Pesticides, 2017, Art. 32.	European Union. Directive 2009/128/EC, 2009, Article 4, 14, and Annex III.	United States of America. Federal Insecticide, Fungicide, and Rodenticide Act, 1947, Sec. 7 U.S.C. 136r-1.
Pesticide Effects Monitoring				Rwanda. Law No. 30/2012 of 01/08/2012 on Governing of Agrochemicals, 2012, Art. 22.					Zambia. Environmental Management Act, 2011, Sec. 66.			China. Regulations on the Management of Pesticides, 2017, Art. 43; China. Administrative Measures for the Registration of Pesticides, 2017, Art. 33-34.		United States of America. Federal Insecticide, Fungicide, and Rodenticide Act, 1947, Sec. 136r.
Adverse effects disclosure											Australia. Agricultural and Veterinary Chemicals Code Act, 1994, Sec. 161.	China. Regulations on the Management of Pesticides, 2017, Art. 42.	European Union. Regulation (EC) No. 1107/2009, 2009, Art. 56.	United States of America. Federal Insecticide, Fungicide, and Rodenticide Act, 1947, Sec. 136d; United States of America. Code of Federal Regulations, Title 40, Chapter I, Subchapter E - Pesticide Programs, 1970, Reg. 159.184; California, United States of America. California Code of Regulations, Title 3, Division 6 - Pesticides and Pest Control Operations, Reg. 6210.

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Element	Dominica	Kenya	Niger	Rwanda	Saint Lucia	Samoa	Solomon Islands	United Republic of Tanzania	Zambia	Zimbabwe	Australia	China	Ireland	United States of America
Pesticide Registration Revocation	Dominica. Pesticides Control (Registration and Licensing) Regulations, 1987, Reg. 6.	Kenya. Pest Control Products (Registration) Regulations, 1984, Reg. 11.	CILSS. Regulations Common to CILSS Member States on the Approval of Pesticides, 1999, Art. 13.5.		Saint Lucia. Pesticides and Toxic Chemical Control Act, 2001, Sec. 25; Saint Lucia. Pesticides Control (Registration and Licensing) Regulations, S.I. No. 71, 1987, Reg. 8.	Samoa. Pesticides Regulations, 2011, Reg. 15.					Australia. Agricultural and Veterinary Chemicals Code Act, 1994, Sec. 41; Australia. Agricultural and Veterinary Chemicals Code Act, 1994, Sec. 101.	China. Regulations on the Management of Pesticides, 2017, Art. 43; China. Administrative Measures for the Registration of Pesticides, 2017, Art. 37.	European Union. Regulation (EC) No. 1107/2009 of the European Parliament and of the Council of 21 October 2009 Concerning the Placing of Plant Protection Products on the Market and Repealing Council Directives 79/117/EEC and 91/414/EEC, 2009, Art. 21.	United States of America. Federal Insecticide, Fungicide, and Rodenticide Act, 1947, Sec. 136d(b), 136q(b).
Liability for Harm to Pollinators											New South Wales, Australia. New South Wales Pesticides Act, 1999, Sec. 8, 11.			California, United States of America. California Food and Agricultural Code, Division 13 - Bee Management and Honey Production, Sec. 29047.



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