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FAO Progressive Management Pathway for Terrestrial Animal Biosecurity (FAO-PMP-TAB)

Putting the framework into action

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FAO Progressive Management Pathway for Terrestrial Animal Biosecurity (FAO-PMP-TAB)

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Preface

In an era marked by increasing global interconnectivity, climate variability, and the emergence and spread of transboundary animal diseases, the need for robust and sustainable biosecurity systems has never been more urgent. The Food and Agriculture Organization of the United Nations (FAO) has long recognized the critical role of biosecurity in safeguarding animal health, protecting livelihoods and promoting food security. This handbook introduces the FAO Progressive Management Pathway for Terrestrial Animal Biosecurity (FAO-PMP-TAB) – a comprehensive, stepwise framework designed to guide countries in systematically enhancing biosecurity across terrestrial animal value chains.

The FAO-PMP-TAB offers a practical roadmap for countries to identify biosecurity risks, engage stakeholders, pilot targeted interventions and scale up successful practices. The framework is adaptable to diverse national contexts and value chains, from traditional livestock systems to captive wildlife, and is built on principles of inclusivity, sustainability and evidence-based decision-making.

This FAO-PMP-TAB is the result of extensive collaboration among FAO experts, national authorities, veterinary professionals and local stakeholders. It draws on FAO's decades of experience in animal health and production, while also incorporating recent lessons from pilot implementations in various countries. Notably, the FAO-PMP-TAB is a relatively new framework, and while it is grounded in sound principles and practical experience, its guidance will continue to evolve. The framework and its supporting tools will be updated to reflect new insights, challenges and innovations as countries implement the pathway and share their experiences.

Structured around four progressive steps, the FAO-PMP-TAB process begins with stakeholder engagement and situation analysis, followed by the co-creation and piloting of biosecurity initiatives. It then guides users through the process of scaling up these initiatives, and concludes with strategies for institutionalizing sustainable biosecurity systems.

Importantly, this document is not prescriptive. It recognizes that each country has unique challenges, priorities and capacities. As such, the FAO-PMP-TAB is designed to be flexible, allowing countries to tailor the approach to their specific needs, while maintaining alignment with international standards and best practices.

This handbook is intended for a wide audience, including policymakers, veterinary authorities, researchers, extension officers and private sector actors. It aims to foster a shared understanding of biosecurity and to catalyse coordinated action across sectors. By following the FAO-PMP-TAB, countries can make meaningful progress towards resilient animal health systems, improved livelihoods and a safer, more sustainable future.

We invite all stakeholders to use this handbook as a guide, a reference and a source of inspiration. Together, through collective commitment and action, we can strengthen biosecurity and build a healthier world for animals, people and ecosystems alike.

What is the FAO Progressive Management Pathway for Terrestrial Animal Biosecurity (FAO-PMP-TAB)?

The FAO-PMP-TAB is a stepwise framework to sustainably improve biosecurity along terrestrial animal value chains under a One Health approach. These value chains might involve traditional livestock species such as cattle, pigs or poultry, as well as other terrestrial animals such as captive wildlife. The framework was developed in 2022, aiming to consolidate FAO's extensive experience in strengthening animal health and production.

The FAO-PMP-TAB involves activities at:

- i) the policy and legislative level, such as passing/ updating laws and regulations that promote biosecurity from the bottom up, and enhancing compliance with such laws and regulations;
- ii) the institutional level, such as establishing partnerships between public agencies and stakeholders from the private sector and civil society that contribute to improving biosecurity and reducing risk along the value chains; and
- iii) the business level, such as farmers and other private actors along the value chain adopting good practices that are feasible and profitable for their respective enterprises.

Livestock systems and the environment in which they operate are constantly evolving. The goal of the FAO-PMP-TAB is therefore to provide a framework that guides countries to make incremental investments and progressive

improvements to biosecurity that are consistent with stakeholders' priorities and resources.

What is biosecurity and why is it important?

Biosecurity is "an integrated approach to analysing and managing risks to health that includes policy, regulation, and practices to protect agricultural production systems, human health, and the environment from biological risks."¹

Biosecurity is strengthened by fostering the implementation of good practices along value chains, leading to positive One Health outcomes through enhanced productivity, improved livelihoods and reduced spread of diseases, including zoonotic transmission.

¹ FAO (Food and Agriculture Organization of the United Nations). 2003. Committee on Agriculture, seventeenth session, Rome, 31 March–4 April 2003, Biosecurity in Food and Agriculture, item 9 of the provisional agenda. In: *Food and Agriculture Organization of the United Nations*. Rome. [Cited 10 April 2024]. <https://www.fao.org/4/Y8453e/Y8453e.htm>



What does this handbook offer?

This handbook provides an overview of the expected outcomes for each step of the FAO-PMP-TAB (Figure 1).

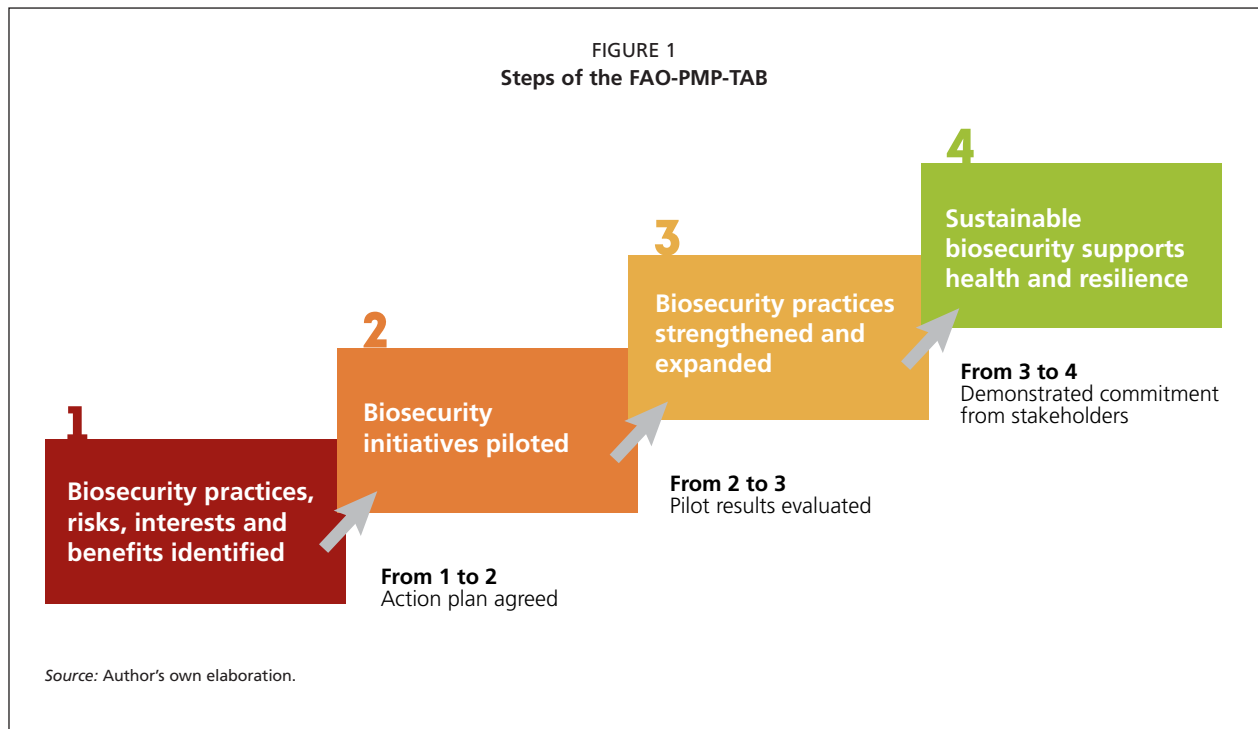
While based on FAO's substantial experience working in many countries over decades, the FAO-PMP-TAB framework has only been developed recently. To date, it has been piloted a few countries, with emphasis on steps 1 and 2. Therefore, the guidance provided for steps 3 and 4 is more generic and based on examples in the literature.

As countries and sectors have different priorities and capacities in terms of biosecurity, the FAO-PMP-TAB is not prescriptive and may be implemented in different ways. The

Annex provides an example of specific outputs and activities for each step of the PMP-TAB; a country may choose to follow this example closely, partially, or not at all.

This handbook is complemented by the [FAO-PMP-TAB toolkit](#), which provides tools and resources relevant for each step, to assist implementation, and monitoring and evaluation (M&E) of interventions.

As the FAO-PMP-TAB is implemented in more countries and contexts, this handbook and the FAO-PMP-TAB toolkit will be reviewed and improved according to feedback from stakeholders and lessons learned.



How is the FAO-PMP-TAB implemented in countries?

The FAO-PMP-TAP starts with participatory approaches to improve biosecurity within a prioritized terrestrial animal value chain node in a selected location, and continues to scale up these improvements. For example, a country may decide that it will first undertake an initiative to improve biosecurity in dairy farms in a municipality, and then, based on the lessons learned, continue to scale up along the entire dairy value chain within the municipality. The process may be replicated in different geographies and/or across different value chains.

The scaling is accompanied by policy, legislative and institutional reforms that are co-developed with stakeholders during participatory co-creation workshops. The FAO-PMP-TAB approach concludes by institutionalizing the process of biosecurity improvement in health and/or agri-food systems at local and national levels.

The FAO-PMP-TAB is structured around four major steps:



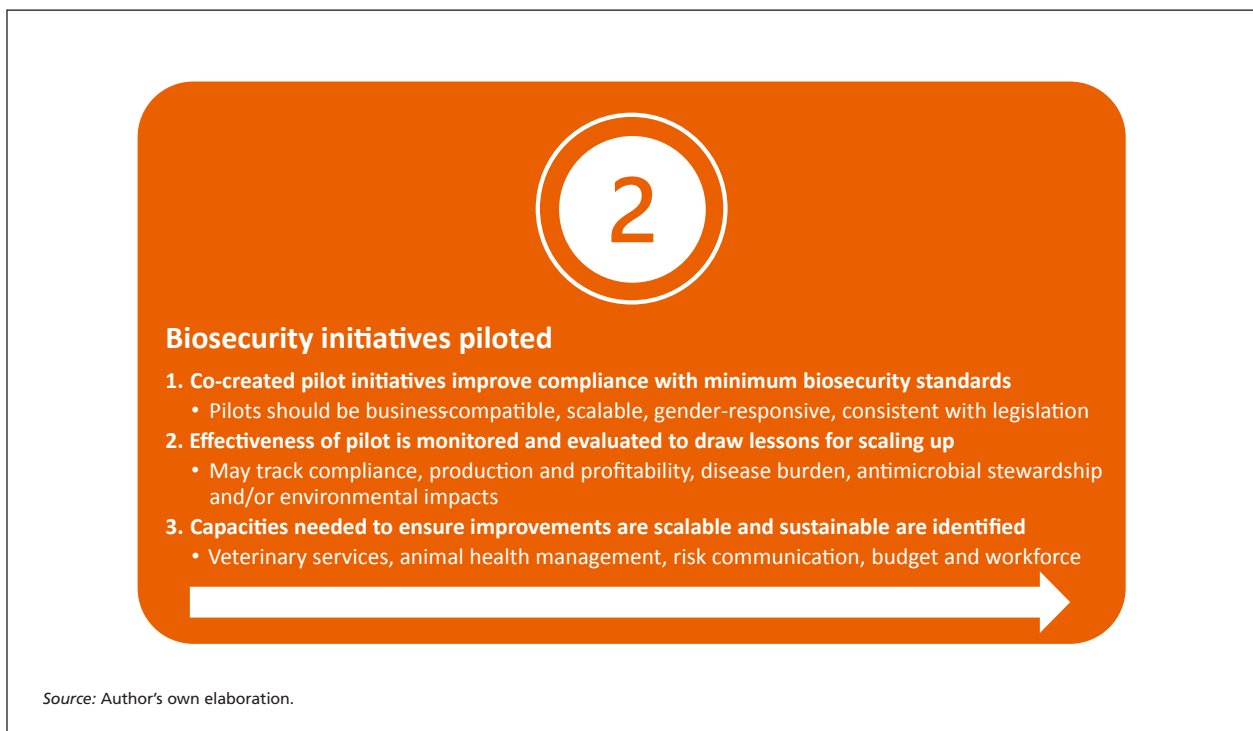
1. BIOSECURITY PRACTICES, RISKS, INTERESTS AND BENEFITS IDENTIFIED: STAKEHOLDER BUY-IN AND SITUATION ANALYSIS



The key outcomes in this step are:

- 1.** Public and private stakeholders are aware of how improvements to terrestrial animal biosecurity can contribute positively to the country's priorities, and the responsibility of each individual stakeholder to implement good practices. They have engaged in a participatory process and indicated their support to progressively strengthen biosecurity in the country.
 - Stakeholder buy-in and support are essential to initiate action. Country priorities may be defined in policy documents, such as livestock development, food security and antimicrobial resistance strategies.
- 2.** An institutional structure (for example, a steering committee and/or taskforce) has been identified or established to lead, support and monitor PMP-TAB activities.
 - Both public and private stakeholders from different disciplines and backgrounds (i.e. multisectoral) should be involved, including, for example, stakeholders with a comprehensive understanding of the priority terrestrial animal value chains, public health, animal health, and legal and policy frameworks. The form of this structure may be dynamic and evolve along the process of improving biosecurity.
- 3.** The current animal biosecurity situation at national and local levels has been described using available information and rapid field data collection (such as through focus group discussions or surveys), if possible. The focus is on the priority value chain(s).
 - At national level, this will usually include stakeholder mapping, an overview of existing policies, laws and regulations, and the level of enforcement by decentralized competent or delegated authorities.
 - At local level, this will usually entail:
 - i.** a description of the current animal health risks and the knowledge, attitudes and practices (KAP) of stakeholders concerning biosecurity;
 - ii.** appraisal of the incentives and barriers to strengthen "good practices", including understanding of business models; and
 - iii.** the capacity of the competent authorities to support and monitor implementation of good practices along the value chain.
- 4.** The scope of a pilot initiative to improve biosecurity has been agreed, including the target sector(s) and geographic locations.
- 5.** Minimum biosecurity standards have been drafted for priority sector(s) in the form of a checklist of good practices tailored to local conditions using participatory approaches.
 - Once achieved, stakeholders will co-create a pilot initiative to progressively improve compliance with the listed good practices.

2. BIOSECURITY INITIATIVES PILOTED: IMPLEMENT BIOSECURITY PILOT IN SELECTED GEOGRAPHIES AND SECTORS



The key outcomes in this step are:

- 1.** One or more pilot initiatives are co-created with public and private stakeholders and implemented at the local level to support the adoption of the draft biosecurity standards in the selected priority value chain node (as per step 1). The pilot initiative(s) should enhance the businesses and/or livelihoods of value chain actors, and be:
 - developed based on findings from the situation analysis;
 - measurable and implementable with available resources;
 - business-compatible and gender-responsive;
 - consistent with legislation; and
 - sustainable and suitable for scale-up.
- 2.** The pilot initiatives are implemented and closely monitored to document progressive improvements in good biosecurity practices. Other measures of impact may also be considered such as production parameters, profitability, disease risk, public health impacts, antimicrobial stewardship and environmental effects. Towards the end of the pilot phase, the effectiveness of the biosecurity pilot initiative(s) is evaluated, including both public and private sector perspectives, to draw lessons for refinement and scaling up (in preparation for step 3).
- 3.** Capacities needed to ensure the biosecurity improvements are scalable and sustainable are identified. These will usually include:
 - Those related to veterinary services, animal health management (including vaccination and other disease prevention measures) and risk communication, as a means to protect the health improvements achieved through enhanced biosecurity, and provide the evidence needed to adapt biosecurity measures according to emerging or changing risks.
 - Workforce and budget allocations to support the progressive implementation and continuous monitoring of the biosecurity improvements.

3. BIOSECURITY STRENGTHENED AND EXPANDED: SCALE UP GOOD PRACTICES THROUGHOUT A REGION OR COUNTRY



The key outcomes in this step are:

- 1.** Agreed biosecurity standards are formally adopted, and compliance is progressively expanded through co-created mechanisms and based on lessons learned from the pilot initiatives. Scaling up may be geographical (for example, to additional districts or regions), along the value chain and/or to other livestock production systems, depending on the country's situation and priorities.
- 2.** Expansion activities are regularly monitored and evaluated to determine the effectiveness of the biosecurity interventions, including public and private sector costs and benefits.
- 3.** Enabling environment and institutional capacities are strengthened to support and sustain the adoption of biosecurity standards. These could include, for example, strengthening of veterinary services and diagnostic laboratories, animal movement and border controls, enhancing awareness and information-sharing about disease risks, revising the terms of employment of animal health officers to better support biosecurity improvements, and/or the passing of laws and regulations.

4. SUSTAINABLE BIOSECURITY SUPPORTS HEALTH AND RESILIENCE: LONG-LASTING SUPPORT TO BIOSECURITY THROUGHOUT THE SYSTEM THROUGH INDIVIDUAL AND COLLECTIVE ACTIONS BASED ON POLICY, INVESTMENT AND INSTITUTIONAL REFORMS



4

Sustainable biosecurity supports health and resilience

- 1. Target sectors meet the minimum biosecurity standards**
 - Ongoing improvements to capacity and resilience, recognizing and adapting to changing risks
- 2. Progressive improvement of biosecurity is institutionalized**
 - Considering 3 dimensions of sustainability: social, economic and environmental

Source: Author's own elaboration.

The key outcomes in this step are:

- 1.** The target sectors meet the minimum biosecurity standards.
 - National standards are met and may be progressively strengthened. Compliance with the standards has been demonstrated to result in positive outcomes for stakeholders along the value chains under a One Health approach.
 - As the risk landscape is constantly changing, the biosecurity system has the capacity to protect value chains against new and evolving threats.
- 2.** The process of biosecurity improvements is institutionalized at national and local levels.
 - This means that biosecurity has become established as part of the culture of the public and private stakeholders involved in terrestrial animal value chains.
 - The national and local policies, laws, and regulations support the progressive improvement of biosecurity.
 - Stakeholders clearly demonstrate ongoing commitment to maintain and improve the biosecurity system, and there is a reliable source of funding to support the associated activities.

Annex

The FAO-PMP-TAB may be implemented in different ways. The tables below provide an example of key outputs and activities that were undertaken (steps 1 and 2) or are foreseen (steps 3 and 4) as part of an FAO project to pilot the FAO-PMP-TAB. A country may choose to follow this example closely, partially, or take a different approach to achieve the outcomes.

STEP	Key outputs
1	Draft of minimum biosecurity standards for the priority sector(s) (biosecurity checklist).
	Short reports (briefs) on: <ul style="list-style-type: none"> • challenges and priorities to improve biosecurity; • the extent to which minimum biosecurity standards are supported by existing policies and legislation; • business models (including the role of terrestrial animals in supporting livelihoods) in the pilot area; • baseline compliance with biosecurity practices for livestock operators in the pilot area; and • capacity and resources of local governments to deliver public goods and services related to biosecurity for the priority sector.
	Government commitment (e.g. via a written endorsement and/or an official launching event).
2	Workplan to implement and monitor a co-created pilot intervention to improve biosecurity in the target sector (with timeline, budget and log frame).
	Evaluation report concerning the biosecurity pilot intervention, with evidence of impact and description of costs and benefits.
	Description of the elements of National Biosecurity Roadmap that includes the initial pilot and, in broad terms, outlines key milestones for progressive improvement of biosecurity in the country. Key milestones will include: <ul style="list-style-type: none"> • the design and implementation of the pilot intervention; • planned expansion of the intervention along the value chain and/or to a larger geographic area; and • important improvements in capacity needed to support the biosecurity improvements.
3	Build/update the National Biosecurity Roadmap.
	Workplans at national and local levels to conduct activities required to support the scale-up.
	M&E reports on the biosecurity initiatives and national-level biosecurity system, with evidence of impact.
4	Updated National Biosecurity Roadmap as implementation progresses.
	Workplans at national and local levels to support the institutionalization of the national biosecurity system and progressive scale-up of compliance with minimum biosecurity standards across all terrestrial animal value chains.
	Regular M&E reports summarizing the biosecurity system, with evidence of impact and demonstrable flexibility to adapt to emerging risks.

STEP 1

Biosecurity practices, risks, interests and benefits identified

Level	Activities	Description
Local	<i>Establish a local-level taskforce/champions group</i>	Comprised of local public and private stakeholders, this group should meet regularly (e.g. monthly), and has a dual role to both provide technical advice on the development and progress of the implementation of the PMP-TAB pilot, and to facilitate support to enhance partnership, funding, political buy-in, coordination, local engagement and ownership of the pilot initiatives.
Local/national	<i>Conduct a rapid situation analysis of biosecurity</i>	Stakeholder consultation and rapid desk review of relevant technical and policy documents to get a broad overview of the current biosecurity situation and ensure that the objectives of the PMP-TAB align with national development objectives or goals. Additional information gathered as needed through rapid field data collection (e.g. focus group discussion, key informant interviews and questionnaires) and the development of business models. The situation analysis should include: <ul style="list-style-type: none"> • Stakeholder identification and mapping. • Description of current biosecurity practices of private actors. The draft checklist (see below) is validated and used to assess the baseline level of compliance. • Appraisal of the incentives and barriers for private actors to strengthen biosecurity, including capacity to implement recommended biosecurity practices (are resources available to invest and/or adopt practices?) Capacity of authorities to support pilot interventions (e.g. through extension services) and audit compliance with minimum biosecurity standard.
Local/national	<i>Draft minimum biosecurity standards for the target sector(s) in the form of a checklist(s)</i>	New checklists can be developed, or existing checklists can be adapted. The checklist(s) should be tested, revised and validated during field visits with local stakeholders.
National	<i>Stakeholder meeting</i>	The meeting is held to introduce the FAO-PMP-TAB to public and private national-level stakeholders across the One Health spectrum and gain political buy-in and support to operationalize the FAO-PMP-TAB. The target sector and location of the pilot initiative(s) may be agreed during this meeting.
National	<i>Establish PMP-TAB guiding group</i>	This group should be multisectoral and comprised of public and private stakeholders who will meet periodically (e.g. biannually) to oversee the progress of the FAO-PMP-TAB implementation and support its scaling up.
National	<i>Map each biosecurity practice included in the checklist against the relevant existing legislation and/or regulations</i>	This is intended to demonstrate that the draft standards are compatible with the legislation. Gaps in legislation may also be identified.

STEP 2

Biosecurity initiatives piloted

Level	Activities	Description
Local	<i>Co-creation workshop</i>	A participatory workshop is held with public and private local-level stakeholders to co-create a pilot initiative to improve biosecurity in the prioritized value chain node. The pilot initiative should involve the implementation of agreed good practices, as well as a mechanism to verify and reward compliance, such as certification.
Local	<i>Meetings of the local-level taskforce/champions group</i>	The local-level taskforce should meet regularly to provide feedback and guidance on the progress of the implementation of the pilot initiatives, and to advocate for revisions of the policies and by-laws implemented in the pilot area to support the long-term adoption of biosecurity minimum standards.
Local	<i>Develop and implement a workplan to implement the pilot initiative</i>	Activities included in the workplan may include training public and private actors in adopting and auditing biosecurity practices, facilitating novel relationships between public and private actors, organizing regular meetings with stakeholders to discuss challenges and way to address them, gathering data on implementation and impacts, etc.
Local	<i>Monitor the pilot intervention</i>	Monitoring should be performed throughout the pilot. Monitoring data should be collected at least at the baseline, midpoint and endpoint of the pilot intervention. Parameters to monitor include compliance with biosecurity checklist, production parameters, health parameters such as morbidity/mortality, and income generated (where possible).
Local	<i>Evaluate pilot intervention</i>	Evaluation is conducted to determine the effectiveness and impact of the biosecurity pilots, including public and private sector benefits, to draw lessons for refinement and scaling up. Stakeholders are engaged in this evaluation.
Local/national	<i>Present and communicate results of the pilot intervention</i>	The results of the pilot intervention should be widely communicated to public and private stakeholders and at local and national levels.
National	<i>Meetings of PMP-TAB guiding group</i>	This group meets regularly to oversee and support the FAO-PMP-TAB implementation.
National	<i>Present the result of the pilot(s)</i>	The audience should include national decision-makers from the public and private sectors, and representatives of other districts or regions to gain support for scaling up.
National	<i>Stakeholder workshop to define the elements of the National Biosecurity Roadmap</i>	This is a living document that outlines in broad terms key milestones for progressive improvement of biosecurity. The first milestone should be the initial pilot intervention. Subsequent milestones will include the planned expansion of the pilot to a larger geographic area and/or other nodes of the value chain, as well as building capacity, as indicated by the national situation analysis.

STEP 3

Biosecurity strengthened and expanded

(and with progressive expansion geographically and along the value chain)

STEP 4

Sustainable biosecurity supports health and resilience

Level	Activities	Description
National	<i>Meetings of PMP-TAB guiding group to update and further develop the Roadmap</i>	The National Biosecurity Roadmap should be reviewed, and the next milestones agreed to expand the adoption of biosecurity standards.
National	<i>Workplans to achieve the next milestones are formulated</i>	Results from pilot evaluation are used to develop a workplan to scale up at national level, so that the minimum biosecurity standards are applied more widely and sustainably supported. The roles of national governments, regional administrations and the private sector are elaborated. For example, a certification programme that rewards actors that implement good practices may be implemented, involving both the public and private sectors. The workplans must be costed and implementable with available public and private resources.
National	<i>Strengthen national capacity to support the adoption of the biosecurity standards</i>	Activities are described in the workplans and could include, for example, strengthening of surveillance and diagnostic laboratories, information-sharing, border control, revising the terms of employment of animal health officers, passing of laws and regulations, and integration of training related to biosecurity into the continuous professional education for veterinarians, paraveterinarians and/or other extension officers.
National	<i>Develop guidelines/ technical and communication material</i>	These will be used to inform and train extension officers and livestock operators (private actors such as producers, slaughterers, traders) on the technical and business dimensions of biosecurity practices, as well as best practices to monitor compliance (e.g. auditing).
National/local	<i>Monitoring and evaluation</i>	Implement a monitoring system, including the definition of a set of indicators to monitor the biosecurity improvements at national level. Evaluation should be conducted periodically (e.g. biannually). The interventions are routinely monitored, and evaluation is conducted periodically to determine the effectiveness of the biosecurity interventions, including public and private sector benefits.
Local	<i>Co-creation workshop for scaling</i>	Conduct participatory workshop(s) with public and private local-level stakeholders to co-create the mechanism for expansion of the pilot initiative to achieve impact at scale.
Local	<i>Expansion workplan</i>	Engage stakeholders to draft and implement a workplan to scale-up the biosecurity improvements, with a clear budget and M&E system. As in Step 2, the plan should be implementable with existing public and private sector resources.

FAO ANIMAL PRODUCTION AND HEALTH HANDBOOKS

1. African swine fever epidemiology and geographic information systems – Application for disease management, 2025 (En)
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^e E-publication

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Drawing on FAO's extensive expertise, this handbook is an essential resource for researchers, policymakers, veterinary practitioners and other stakeholders dedicated to advancing animal health and production. It contains all the knowledge necessary to implement the FAO Progressive Management Pathway for Terrestrial Animal Biosecurity (FAO-PMP-TAB), an innovative framework designed to systematically enhance biosecurity in terrestrial animal value chains. This handbook offers a step-by-step guide to sustainably improve biosecurity, encompassing policy and legislative reforms, institutional partnerships, and practical business-oriented initiatives. Learn how to identify biosecurity risks, co-create and pilot interventions, and scale up practices to achieve sustainable health and resilience. Equip yourself with the knowledge to implement effective biosecurity measures and contribute to a healthier, more sustainable future.

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