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Assessing and advancing phytosanitary capabilities in targeted countries in eastern and southern Africa: a pathway to resilient agriculture

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Assessing and advancing phytosanitary capabilities in targeted countries in eastern and southern Africa: a pathway to resilient agriculture

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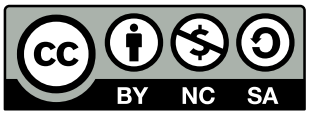

Abstract

Plant pests pose significant threats to agricultural production, food security, and economic stability in the Common Market for Eastern and Southern Africa (COMESA) region, with annual crop losses estimated at 30–60 percent. This study, conducted under the EU-funded project *"Strengthening Food Control and Phytosanitary Capacities and Governance"* (GCP/GLO/949/EC) and coordinated by the International Plant Protection Convention (IPPC) Secretariat and the Food and Agriculture Organization of the United Nations, assesses phytosanitary capacities in eleven COMESA countries through phytosanitary capacity evaluations (PCEs). The findings reveal that countries prioritize core operational activities particularly pest diagnostics, surveillance, pest risk analysis, and import and export systems with six countries selecting at least 11 of 13 PCEs. Governance areas, such as stakeholder engagement, remain under-addressed. Key challenges include outdated legislation, limited diagnostic infrastructure, weak surveillance systems, and inadequate risk analysis capacities. To address these gaps, the study recommends modernizing legal frameworks, strengthening technical capacities, adopting digital solutions like the IPPC ePhyto Solution, and enhancing regional coordination through COMESA and the Inter-African Phytosanitary Council of the African Union in collaboration with IPPC Secretariat. Establishing regional training hubs and fostering partnerships will support sustainable phytosanitary systems aligned with global standards and regional strategies. Strengthened systems are vital for improving trade, ensuring food security, and supporting sustainable economic growth across Africa.

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Acknowledgements

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The IPPC Secretariat gratefully acknowledges the contributions of the national plant protection organizations (NPPOs) and key stakeholders from the eleven Common Market for Eastern and Southern Africa (COMESA) countries that participated in the phytosanitary capacity evaluations (PCEs). Their commitment and insights were essential to this analysis.

Special thanks are extended to the facilitators and national coordinators who supported the PCE processes, and to the representatives of the Inter-African Phytosanitary Council (IAPSC) for their collaboration and regional leadership.

The IPPC Secretariat also appreciates the guidance and support provided by FAO's Legal Office, the Food Systems and Food Safety Division (ESF), and the Plant Production and Protection Division (NSP). The IPPC Secretariat extends its appreciation to the European Union for its generous financial support, which made this work possible.

Abbreviations

AfCTFA	African Continental Free Trade Area
AU-IAPSC	Inter-African Phytosanitary Council of the African Union
COMESA	Common Market for Eastern and Southern Africa
FAO	Food and Agriculture Organization of the United Nations
IPPC	International Plant Protection Convention
LFA	logical framework approach
M&E	Monitoring and evaluation
NPPO	national plant protection organization
PCE	phytosanitary capacity evaluation
PFA	pest free areas
PHSA	Plant Health Strategy for Africa
PRA	pest risk analysis
RBM	results-based management
REC	regional economic community
RPPO	regional plant protection organization
SDG	Sustainable Development Goal
SPS	sanitary and phytosanitary
SPS Agreement	Agreement on the Application of Sanitary and Phytosanitary Measures of the WTO
SWOT analysis	strengths, weaknesses, opportunities, threats analysis
WTO	World Trade Organization

Executive summary

Plant pests represent a major challenge to agricultural productivity, food security, environmental sustainability, and trade efficiency within the Common Market for Eastern and Southern Africa (COMESA) region. These pests cause annual crop losses ranging from 30 percent to 60 percent. Tackling these risks is critical to ensuring economic stability, protecting livelihoods, and strengthening food security, particularly in the region's most vulnerable nations

Under the European Union-funded project *"Strengthening Food Control and Phytosanitary Capacities and Governance"* (GCP/GLO/949/EC), the International Plant Protection Convention (IPPC) Secretariat, in collaboration with the Food and Agriculture Organization of the United Nations (FAO), conducted comprehensive phytosanitary capacity evaluations (PCEs) in 11 COMESA countries: Djibouti, Egypt, Eswatini, Kenya, Malawi, Mauritius, Rwanda, Seychelles, Uganda, Zambia and Zimbabwe. Phytosanitary capacity evaluations are a strategic tool developed by the IPPC to assist countries in identifying gaps within their phytosanitary systems, used to implement targeted improvements, ultimately supporting safe international trade and robust plant health systems.

The COMESA assessments revealed high engagement across the region, with six out of the 11 participating countries selecting at least 11 out of the 13 available PCE modules, to improve their phytosanitary systems. These modules are thematic components used to assess specific areas of a country's phytosanitary system, such as diagnostics, surveillance, legislation, and risk analysis. This level of engagement by national plant protection organizations (NPPOs), about the importance of comprehensive evaluations, underscores the recognition of IPPC's standards, rather than addressing issues in isolation. Most countries prioritized modules related to core operational activities, such as pest diagnostics, surveillance, and pest risk analysis, reflecting the urgent need to strengthen their technical capacity in these areas. However, modules pertaining to governance, particularly stakeholder engagement and the assessment of environmental factors affecting NPPO operations, were among the least selected, highlighting a significant gap in long-term strategic planning and policy coordination.

The evaluations identified several systemic challenges affecting the effectiveness of phytosanitary systems in the COMESA region. Outdated legislative frameworks, unclear institutional mandates, and weak enforcement mechanisms continue to hinder effective regulation. Structural weaknesses within NPPOs, such as shortages of specialized personnel, insufficient internal oversight, and limited financial autonomy, further exacerbate operational inefficiencies. The lack of modern diagnostic tools and obsolete laboratory infrastructure compromise early detection and response capabilities. Inadequate pest surveillance systems and underdeveloped import/export certification processes, which often rely on manual procedures, increase the risk of pest incursions and trade disruptions. These technical deficiencies are compounded by insufficient pest risk analysis (PRA) programmes, fragmented pest eradication initiatives, and a general lack of structured coordination with research institutions. Additionally, most NPPOs operate with unstable funding sources, relying heavily on inconsistent government budgets or external donor support, which undermine the sustainability of capacity-building efforts.

To address these challenges, the assessment presents a comprehensive way forward focused on strengthening governance frameworks, enhancing technical capabilities, and fostering regional cooperation. Legal reforms are urgently needed to align national regulations with IPPC standards and the World Trade Organization's (WTO's) Sanitary and Phytosanitary Agreement (SPS Agreement). Updating phytosanitary legislation, clearly defining NPPO mandates, and establishing cost-recovery mechanisms, will enhance regulatory oversight and accountability. Investing in modern laboratory infrastructure, adopting standardized surveillance protocols,

and implementing digital solutions such as the ePhyto system can streamline import/export processes and improve pest detection and management. Enhanced governance structures, including the establishment of national phytosanitary steering committees and fostering public–private partnerships will strengthen stakeholder engagement and ensure coordinated responses to plant health threats.

Sustainable funding remains a critical factor in achieving long-term capacity-development goals. Integrating phytosanitary initiatives into national budgets, diversifying funding sources, and securing donor support for long-term projects are essential steps to ensuring continuity. Regional cooperation, facilitated by regional economic communities (RECs) like COMESA, play a pivotal role in harmonizing phytosanitary regulations, facilitating trade, and strengthening NPPO operational capabilities. The collaboration between the African Union Inter-African Phytosanitary Council (AU-IAPSC) and the IPPC is central to this effort. By aligning regional capacity-development initiatives with the Plant Health Strategy for Africa (PHSA) and supporting the objectives of the African Continental Free Trade Area (AfCFTA), these partnerships can enhance regional phytosanitary resilience and economic growth.

Capacity-development efforts should prioritize the establishment of regional training and development hubs to provide continuous learning opportunities for NPPO personnel, promote best practice sharing, and strengthen compliance with international phytosanitary standards. These hubs will not only enhance technical expertise but also support the implementation of harmonized surveillance systems, diagnostic networks, and emergency response frameworks across the region. Innovative digital tools like the African Phytosanitary Programme, are crucial in addressing infrastructure gaps, facilitating pest monitoring, and improving diagnostic capabilities.

Ultimately, regional and continental coordination of multi-country phytosanitary initiatives offers a more effective approach to addressing capacity development needs. Donor consortia and collaborative partnerships should focus on maximizing investment impacts through coordinated planning and resource-sharing, minimizing redundancies in efforts, resources, and initiatives, and ensuring that all phytosanitary efforts contribute to a unified regional strategy. Transparent engagement with donors, national governments, and international partners, will be key to securing sustained investment and achieving lasting improvements in phytosanitary capacity.

Introduction

Phytosanitary systems play a pivotal role in safeguarding global food security, promoting sustainable agriculture, and facilitating safe international trade. As the world becomes increasingly interconnected, the movement of goods, people, and agricultural products grows, heightening the risk of international pest outbreaks that threaten crop production, biodiversity, and economic stability.[1,2] In Africa, where agriculture underpins most rural livelihoods and broader regional economies, strengthening plant health systems is essential to mitigating risks, ensuring food availability, and enhancing trade competitiveness.[3]

This assessment aligns with global, regional, and national frameworks that emphasize the importance of resilient agricultural systems and sustainable development. At the global level, the United Nations Sustainable Development Goals (SDGs) provide a comprehensive framework to address poverty, hunger, and environmental sustainability.[1,4] Strengthening phytosanitary systems directly supports several SDGs.

- **SDG 2 (Zero Hunger):** By reducing crop losses due to pests and diseases, improved plant health systems contribute to enhanced food security and agricultural productivity.[5]
- **SDG 12 (Responsible Consumption and Production):** Strong phytosanitary measures minimize food waste along supply chains and promote sustainable production systems.[4]
- **SDG 15 (Life on Land):** Effective pest management protects terrestrial ecosystems, preserves biodiversity, and mitigates the spread of invasive species.[2]
- **SDG 17 (Partnerships for the Goals):** This initiative embodies global cooperation, bringing together international organizations, regional bodies, and national governments to achieve shared phytosanitary objectives.[6]

Through its Strategic Framework 2022–2031, FAO aims to achieve the "Four Betters": Better Production, Better Nutrition, a Better Environment, and a Better Life.[1] Strengthening phytosanitary capacity aligns with these priorities by enhancing the sustainability and resilience of agricultural systems, ensuring the safe movement of agricultural goods, and safeguarding ecosystems. This assessment also supports the objectives of the International Plant Protection Convention (IPPC) Strategic Framework 2020–2030, which emphasizes preventing the spread of pests, promoting trade facilitation through harmonized phytosanitary measures, and building the capacity of national and regional plant protection organizations (RPPP).[2]

Regionally, this assessment contributes to the implementation of the Plant Health Strategy for Africa (PHSA) and the Sanitary and Phytosanitary (SPS) Policy Framework for Africa, both of which provide essential policy guidance to strengthen Africa's phytosanitary systems.[7] The African Union and its specialized agency, the Inter-African Phytosanitary Council,[3] recognize that plant health is integral to achieving sustainable agricultural growth, enhancing intra-African trade, and supporting the objectives of the African Continental Free Trade Area (AfCFTA.)[3] By facilitating harmonized phytosanitary regulations and fostering capacity development across the continent, the PHSA and SPS frameworks aim to mitigate pest risks, improve trade efficiency, and promote food safety.[7]

Africa faces unique challenges in phytosanitary management, including emerging pest threats exacerbated by climate change, limited infrastructure, inadequate diagnostic and surveillance capacity, and fragmented regulatory systems.[8] These issues hinder market access, disrupt agricultural supply chains, and threaten regional food security. Addressing these challenges requires a coordinated, multi-stakeholder approach that integrates global standards with region-specific solutions.[2,3] This assessment, therefore, underscores the importance of international cooperation, regional integration, and national commitment to developing robust and sustainable phytosanitary systems.

Through initiatives such as phytosanitary capacity evaluations (PCEs) supported by the European Union and coordinated by the IPPC Secretariat and the Food and Agriculture

Organization (FAO) Agrifood Systems and Food Safety Division, participating countries in the Common Market for Eastern and Southern Africa (COMESA) have taken significant steps to assess, strengthen, and harmonize their phytosanitary systems.[9] These evaluations provide a roadmap for targeted interventions, institutional capacity building, and policy reforms aimed at enhancing plant health governance and facilitating safe trade.

Ultimately, the work outlined in this assessment is not just about protecting plants, it is about safeguarding the livelihoods of millions of people, ensuring stable food supplies, supporting economic development, and contributing to the global agenda for sustainable development. The collaborative efforts of the IPPC, FAO, African Union Inter-African Phytosanitary Council (AU-IAPSC), COMESA, and national governments, exemplify how coordinated action, aligned with global and regional strategies, can drive impactful and lasting improvements in phytosanitary systems across Africa.[1, 2, 3, 9]

Materials and methods

Profile of the common market region and member countries

The COMESA region comprises 21 member countries, spanning two-thirds of the African continent, home to 640 million people.[9] As a regional economic bloc, COMESA promotes integration through enhanced trade, agriculture, and food security. A key priority is phytosanitary capacity development, which strengthens plant health systems and ensures compliance with international trade standards.

Table 1: COMESA member countries covered by the project *"Strengthening Food Control and Phytosanitary Capacities and Governance"* (GCP/GLO/949/EC)

	FCSA	PCE
1. **Comoros**	✓	
2. **Uganda**	✓	✓
3. **Eswatini**	✓	✓
4. **Mauritius**	✓	✓
5. **Seychelles**	✓	✓
6. **Kenya**	✓	✓
7. **Rwanda**	✓	✓
8. **Zimbabwe**	✓	✓
9. **Egypt**	✓	✓
10. **Djibouti**		✓
11. **Zambia**		✓
12. **Malawi**		✓
Total	**9**	**11**

Notes: COMESA, Common Market for Eastern and Southern Africa.
Source: IPPC Secretariat.

Plant pests pose significant threats to the region's agricultural production, causing annual crop losses of 30–60 percent.[8] Strengthening national phytosanitary systems is critical to mitigating these risks and aligning with global standards, such as the IPPC[2] and the World Trade Organization's SPS Agreement.[10]

Overview of the PCE modules

To strengthen plant health systems, the EU-funded project *"Strengthening Food Control and Phytosanitary Capacities and Governance"* (GCP/GLO/949/EC) supported COMESA countries[8] in conducting PCEs.[11] These evaluations assess and enhance national plant health frameworks, focusing on import and export regulations, pest surveillance, diagnostics, and legal frameworks.

Eleven COMESA countries participated in this initiative: Djibouti, Egypt, Eswatini, Kenya, Malawi, Mauritius, Rwanda, Seychelles, Uganda, Zambia, and Zimbabwe. Table 1 highlights their involvement, showcasing COMESA's commitment to improving plant health systems, ensuring safe trade, and building agricultural resilience.

A PCE is a structured tool designed to help NPPOs[12] evaluate and improve their phytosanitary systems. It enables countries to identify gaps, assess strengths, and develop targeted strategies to enhance plant health governance, trade facilitation, and pest management. The PCE framework consists of 13 modules,[11] organized into three macro-level components.

Table 2: The 13 modules within PCEs are categorized into three macro-level components

Category	FCSA	PCE
System Level	1. Country profile *(Mandatory)*	National agricultural context, policies, and phytosanitary framework.
	2.National phytosanitary legislation	Legal framework and regulatory enforcement.
	3.Environmental forces assessment	Impact of external policies, trade agreements, and environmental factors.
Organization Level	4. NPPO mission and strategy	Vision, objectives, and governance of NPPOs.
	5.NPPO structure and processes	Operational procedures, management, and coordination.
	6. NPPO Resources	Financial, human, and logistical capacity.
Core Activities	7. Pest diagnostic capacity	Laboratory capabilities, pest identification, and response.
	8.Pest surveillance and reporting	Monitoring, pest outbreak detection, and reporting.
	9. Pest Eradication Capacity	Measures for pest elimination and control.
	10.Phytosanitary import regulatory system	Entry point, quarantine, and risk mitigation.
	11. Pest Risk Analysis	Scientific evaluation of pest threats to trade.
	12. Pest free areas and low Pest prevalence	Establishing and maintaining pest free regions.
	13.Export certification, re-export, and transit	Compliance with international trade standards for agricultural exports.

Source: IPPC Secretariat.

PCE process and implementation steps

The PCE process follows a structured, multi-phase approach to ensure a comprehensive assessment of a country's phytosanitary capacity. This methodology enables NPPOs to systematically identify weaknesses, validate findings with stakeholders, and implement targeted improvements to strengthen plant health systems.

The first phase of the PCE process involves module selection and problem analysis. NPPOs identify priority areas based on national phytosanitary needs, considering factors such as agricultural trade, pest management challenges, and regulatory gaps. At this stage, baseline data collection begins, providing essential insights into existing capacities and informing the subsequent phases of the evaluation. Following the initial assessment, the in-depth analysis and stakeholder engagement phase focuses on evaluating the selected modules using standardized methodologies. This involves technical assessments, regulatory reviews, and institutional capacity mapping, and ensures the evaluation captures on-the-ground realities and aligns with broader phytosanitary and trade policies. The third phase, which includes strategic planning and capacity development, translates assessment results into actionable strategies. Based on the findings, countries draft an action plan that outlines key interventions, including necessary policy changes, infrastructure development, and human resource capacity-building efforts. A critical component of this phase is the development of costed implementation strategies, ensuring that the proposed actions are financially sustainable and aligned with national and regional development priorities. Finally, the monitoring, evaluation, and review phase is essential for tracking progress and ensuring phytosanitary improvements are sustained. Countries are encouraged to repeat the PCE every three to four years, allowing them to assess progress, refine strategies, and address emerging challenges.

When a country selects Module 2: National phytosanitary legislation under the PCE process, it triggers an additional task to assess the legal framework, identify gaps, and propose reforms aligned with international standards such as the IPPC and World Trade Organization (WTO)-SPS Agreement.[13,14] Updating phytosanitary laws to meet these standards is a key PCE outcome, facilitating safe trade and stronger plant health systems. By referencing global best practice and utilizing international legal experts, the IPPC Secretariat helps analyse existing laws, identify gaps, and recommend improvements. They collaborate with national stakeholders to draft legislation that aligns with domestic needs and legal frameworks, guided by PCE priorities. Drafts are reviewed by stakeholders, validated, and presented to lawmakers for adoption. This process, led by Module 2, strengthens national phytosanitary systems and promotes international regulatory harmonization, supporting safer global trade.

Data collection techniques

A data-driven approach is essential in identifying gaps in phytosanitary capacity. The approach incorporates both quantitative and qualitative data collection techniques to develop a comprehensive understanding of phytosanitary systems across participating countries. The key data collection methods used in this assessment include:

- document and policy review;
- surveys and questionnaires;
- courses and workshops; and
- field assessments and site visits.

Each method provides valuable insights into different aspects of phytosanitary governance, regulatory enforcement, trade facilitation, and technical capacity building.

Document and policy review

A comprehensive analysis of national phytosanitary policies, laws, and trade regulations is essential to ensure alignment with international standards, such as the IPPC and the WTO SPS Agreement.[13,14] This review helps identify regulatory gaps, enforcement challenges, and areas needing policy reform, ensuring that national frameworks support both plant health protection and international trade. One of the key components of document review is the examination of national plant protection laws and regulations.[13] This process assesses whether existing legislation aligns with international phytosanitary obligations and trade agreements, ensuring that NPPOs operate within a legally sound and globally recognized regulatory framework. It also helps identify gaps in enforcement mechanisms, legislative inconsistencies, or outdated laws, that may hinder phytosanitary capacity and trade competitiveness. Strengthening these legal frameworks is crucial for enhancing risk-based phytosanitary management and regulatory compliance. Another critical area of assessment is pest surveillance and diagnostic reports, which analyse existing pest monitoring frameworks to determine their effectiveness, geographic coverage, and reporting accuracy. These reports provide valuable insights into how efficiently a country detects, tracks, and responds to plant pest threats. The review of border inspection protocols is equally important, as it evaluates SPS measures applied at entry points to ensure compliance with import/export requirements.

This kind of analysis examines the efficiency of customs procedures, risk-based inspection strategies, and quarantine regulations to determine if they effectively prevent the introduction and spread of pests and diseases within participating countries. Weaknesses in border inspection protocols may expose a country to biosecurity risks, trade disruptions, and non-compliance penalties in international markets. Additionally, the analysis of trade compliance reports helps assess phytosanitary barriers affecting export markets and regulatory constraints on agricultural trade. This kind of analysis includes reviewing export rejections, compliance challenges faced by traders, and non-tariff barriers that limit market access.

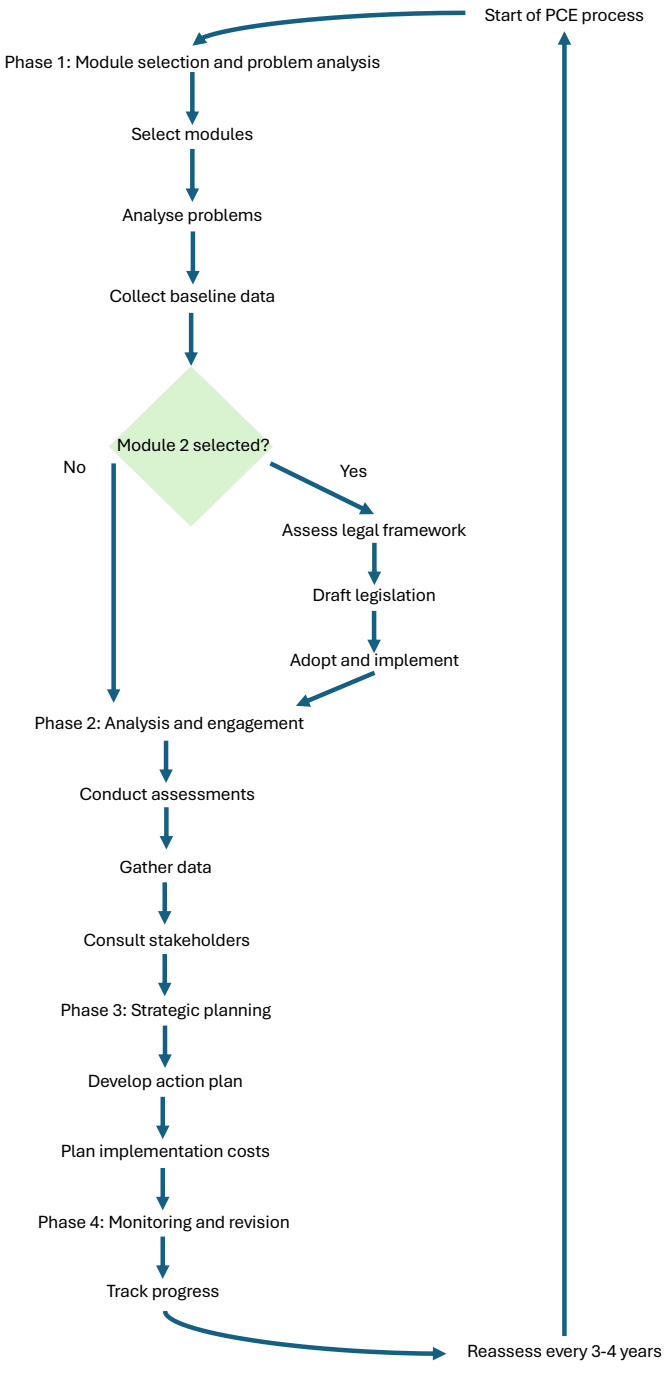
Surveys and questionnaire

Structured surveys and questionnaires are vital tools for collecting country-specific data from key phytosanitary stakeholders, including representatives from the agriculture, trade, and regulatory sectors. These tasks facilitate broad and inclusive data collection, ensuring diverse perspectives are considered when identifying challenges, assessing regulations, and improving phytosanitary systems.

A crucial component of the PCE problem analysis process involves distributing the module-specific questionnaire to relevant stakeholders before holding face-to-face workshops. This preparatory step allows stakeholders to reflect on the specific operations or roles of NPPOs and provides informed responses addressing the capacity and operational challenges within their respective areas of responsibility. The surveys, which are administered through online and paper-based formats, are distributed to a broad range of participants, including NPPO officials, customs officers, exporters, farmers, and trade regulators. These surveys capture valuable insights into several key areas:

- The effectiveness of current phytosanitary regulations.
- Challenges related to pest control, surveillance, and risk assessment.
- Trade barriers associated with export/import regulations and compliance costs.
- Collecting feedback from a diverse range of respondents ensures a comprehensive overview of national phytosanitary capacity and highlights priority areas in need of improvement.

Figure 1: Flowchart of the PCE implementation process



Source: IPPC Secretariat.

PCE course and workshop

The PCE course and workshop serve as key platforms for strengthening phytosanitary capacity and fostering collaborative decision-making among NPPOs, government agencies, and relevant stakeholders. The course is designed to provide technical know-how, strategic insights, and policy alignment, enhancing risk-based phytosanitary management and trade facilitation. Participants engage in structured discussions, analytical assessments, and capacity-building exercises aimed at improving sanitary and phytosanitary (SPS) measures in alignment with international standards. The course and workshop attract a diverse group of participants, reflecting the multi-sectoral nature of phytosanitary governance. Each participant plays a distinct role in ensuring the effectiveness of the assessment process and subsequent policy implementation.

The PCE course and workshop employ a hybrid learning approach, combining virtual and in-person exercises to enhance accessibility, broaden participation, and ensure effective knowledge transfer. This dual-mode interaction allows participants from different geographic locations and sectors to engage in the assessment process efficiently while leveraging both remote and face-to-face collaboration. The virtual sessions integrate interactive tools, such as live polls, Q&A forums, and collaborative document sharing, ensuring active participation and engagement. These online interactions also facilitate cross-country collaboration, allowing NPPO representatives and stakeholders to exchange insights and best practices before convening in person.

The core component of the course is typically delivered in person, allowing for direct engagement, interactive learning, and collaborative strategy development. Face-to-face workshops also foster a deeper level of discussion, where participants can actively engage in group exercises, scenario-based problem-solving, and technical training sessions. This setting enables more dynamic interactions, strengthening the understanding and application of analytical tools such as SWOT (strengths, weaknesses, opportunities, threats) analysis, a logical framework approach (LFA), and results-based management (RBM).

To complement the standardized surveys, structured and open-ended questionnaires are also used to gather more detailed and nuanced data. These include:

- Quantifiable response options (e.g. ranking phytosanitary challenges) that provide measurable indicators of system performance
- Open-ended sections where participants can describe specific issues in areas such as pest management, border inspections, and compliance with trade regulations, capturing context-specific insights that may not be fully addressed by multiple-choice questions

Recognizing the specialized concerns of different stakeholder groups, targeted questionnaires are developed for groups such as exporters, laboratory technicians, and quarantine officers. These tailored tools focus on operational and technical challenges unique to each group, enabling a detailed analysis of specialized phytosanitary issues.

Table 3: Participants and their roles in the course and workshop

Participant category	Role and contribution
NPPO representatives and inspectors	As key regulators of plant health, inspectors and trade compliance, NPPO officials provide expertise on national phytosanitary policies, inspection procedures, risk assessments, and international obligations. Inspectors play a crucial role in border inspections, pest detection, and enforcement of phytosanitary regulations. Together, they actively engage in technical discussions, policy analysis, and action planning to enhance phytosanitary governance.
Facilitators	The course is guided by experienced facilitators, often IPPC-certified experts, who provide technical guidance, methodological support, and training on analytical tools such as SWOT analysis, LFA, and RBM
Stakeholders from government agencies	Representatives from ministries of agriculture, trade, environment, and customs ensure regulatory coherence between plant health policies and broader trade facilitation frameworks. Their role is to align phytosanitary measures with national agricultural and economic policies, ensuring compliance with international trade standards.
Private sector representatives	Exporters, importers, and agribusiness sector representatives contribute insights on trade barriers, compliance challenges, and market requirements. Their participation ensures that phytosanitary policies consider industry perspectives, facilitating smoother trade operations and improved market access.
Development partners and international organizations	Organizations such as the FAO, the WTO, and regional economic communities provide technical expertise, funding support, and policy recommendations. They play a critical role in strengthening SPS systems at both national and regional levels.

Source: IPPC Secretariat.

PCE workshop mechanisms and analytical tools

To ensure a structured, data-driven, and results-oriented assessment, the PCE workshops employ a combination of stakeholder consultations, interactive discussions, and analytical frameworks. These mechanisms facilitate comprehensive data collection, stakeholder engagement, and strategic planning, ultimately leading to enhanced phytosanitary governance and trade facilitation.

Stakeholder consultations

Stakeholder engagement is a critical component of the PCE process, ensuring that diverse perspectives are considered in phytosanitary capacity development. By bringing together regulatory bodies, industry representatives, policymakers, and trade experts, the workshops foster inclusive decision-making and policy alignment. The consultation process includes:

- Sector-specific discussions – Representatives from NPPOs, private sector organizations, and policymakers engage in targeted dialogues to identify key phytosanitary challenges and opportunities. These discussions help in recognizing sector-specific needs and ensuring that policies are practical, effective, and aligned with trade realities.
- Policy roundtables – Government officials, trade experts, and SPS specialists assess the alignment of phytosanitary policies with national economic strategies, regional trade frameworks, and international standards. These sessions help in identifying gaps in policy implementation and ensuring that regulatory measures do not impose unnecessary trade barriers.
- Industry consultations – Representatives from agribusiness, exporters, and importers share their insights on export barriers, compliance costs, and market access challenges. Their contributions ensure that phytosanitary policies are designed not just for regulatory enforcement but also to support trade competitiveness and market expansion.

Group discussions and technical presentations

PCE workshops emphasize collaborative learning and peer-to-peer knowledge exchange through interactive group discussions and technical presentations. These sessions allow participants to analyse real-world case studies, refine phytosanitary strategies, and contribute to regional policy development.

- Thematic group exercises – Participants are divided into working groups based on specific phytosanitary themes, such as pest surveillance, risk analysis, entry points, and regulatory frameworks. Each group conducts an in-depth review of the assigned theme, identifying strengths, weaknesses, and areas for improvement.
- Best practice sharing – Case studies from regional and international experiences are presented to showcase successful phytosanitary interventions, pest management strategies, and SPS regulatory improvements. By analysing real-world applications, participants can adapt proven strategies to their national contexts.
- Policy briefs and action plans – Each group develops policy briefs and strategic action plans, summarizing key findings, recommendations, and implementation strategies. These outputs serve as blueprints for national and regional phytosanitary improvements, providing governments and NPPOs with clear, actionable roadmaps.

Through interactive learning and knowledge exchange, the workshop fosters capacity building, policy innovation, and regional cooperation, ensuring that phytosanitary measures are proactive and responsive to emerging plant health threats.

Analytical tools: Strengths, weaknesses, opportunities, threats (SWOT) analysis, logical framework approach, and results-based management

To guide structured decision-making and capacity assessment, the workshop incorporates established analytical frameworks that provide a systematic approach to evaluating and strengthening phytosanitary systems. These include:

- SWOT analysis – This tool is used to evaluate the status of phytosanitary systems, identifying internal strengths and weaknesses as well as external opportunities and threats. The analysis helps in prioritizing areas for intervention and ensuring that strategies agreed by the stakeholders are both realistic and forward-looking.
- Logical framework approach – LFA is applied to develop structured, goal-oriented strategies, ensuring that phytosanitary improvements are measurable, well-planned, and aligned with broader agricultural and trade objectives. By defining clear inputs, outputs, outcomes, and impact indicators, LFA enhances project design and implementation efficiency.
- Results-based management – RBM focuses on tracking performance indicators, establishing monitoring mechanisms, and evaluating the effectiveness of policies that have been implemented. It ensures that phytosanitary capacity-building efforts are outcome-driven, continuously assessed, and adaptable to new challenges.

The integration of these quantitative and qualitative methodologies produces actionable solutions, ensuring that phytosanitary strategies are data-driven, participatory, and aligned with international best practices.

Field assessments and site visits

On-the-ground evaluations play a crucial role in identifying the practical challenges faced by phytosanitary authorities and businesses in implementing plant health measures. These field assessments and site visits allow for direct observation of how phytosanitary systems function in real-world settings, providing critical insights into operational efficiency, infrastructure quality, regulatory enforcement, and procedural effectiveness. Unlike policy reviews or stakeholder consultations, field visits offer a firsthand look at how phytosanitary measures are applied, ensuring that the assessment is comprehensive, and evidence based. A key focus of field assessments is the evaluation of border inspection and quarantine facilities, where customs and phytosanitary authorities enforce SPS measures at ports of entry. These visits help assess how plant materials are handled, the effectiveness of pest detection procedures, and the enforcement of import/export regulations. Inspectors evaluate the implementation of risk-based inspection protocols, quarantine processes for imported goods, and the efficiency of phytosanitary clearance procedures. Observing these operations in real-time allows authorities to identify gaps in staff training, procedural weaknesses, and infrastructure limitations that may compromise biosecurity and trade efficiency. Another critical component of site visits is the inspection of pest surveillance and monitoring stations. These include research stations, NPPO monitoring units, and diagnostic laboratories that track and respond to plant health threats. By visiting these facilities, assessors can evaluate surveillance capacity, laboratory diagnostic capabilities, and the effectiveness of pest outbreak response mechanisms. Key aspects reviewed include early detection systems, data collection processes, the accuracy of diagnostic tests, and laboratory response times. The findings from these assessments help strengthen early warning systems, improve pest reporting accuracy, and enhance the country's ability to mitigate phytosanitary risks proactively. The assessment also examines export certification processes, where phytosanitary certificates are issued for commodities destined for international markets. Site visits to NPPO offices, testing laboratories, and certification centres allow for an evaluation of how certificates are processed, the reliability of laboratory diagnostics, and the effectiveness of risk assessment procedures. Ensuring that export certification aligns with international SPS requirements is crucial for facilitating

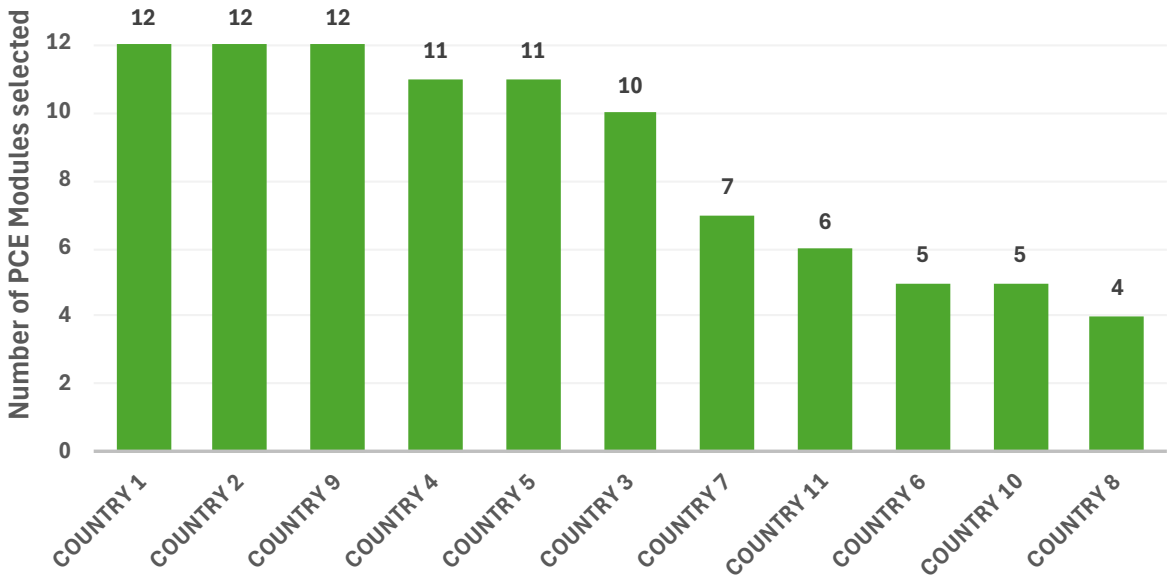
smooth trade, reducing export rejections, and enhancing market access. Observations at these facilities help identify bottlenecks in certification processing, laboratory testing delays, or gaps in traceability systems, all of which could impact compliance with trade regulations. In addition, field assessments cover agricultural production and storage sites, including farms, grain storage facilities, and processing plants. These visits assess pest risks, hygiene practices, and adherence to phytosanitary measures in primary production and post-harvest handling. Observing storage conditions, pest management practices, and sanitation protocols provides insight into whether producers and exporters comply with SPS measures to prevent contamination and infestation.

Results

PCE module selection and its trends in common market countries

All countries are required to complete the mandatory Module 1: Country profile. Among the 11 countries evaluated, half (6 out of 11) completed at least 11 of the 13 available PCE modules, while others completed fewer, with one country selecting the minimum of five modules allowed by the process (Figure 2). Notably, all countries selected Module 7: Pest diagnostic capacity (Figure 2), highlighting its universal importance. Most selected modules fall under the "Core Activities" macro-category, which encompasses more than half of the available PCE modules. This suggests a strong focus by NPPOs on improving internal processes and activities aligned with their mandates. In contrast, Module 3: Environmental forces assessment was the least selected module among the 11 NPPOs, indicating a perception of limited importance or or perceived relevance in the evaluated contexts.

Figure 2: Number of PCE modules selected by countries

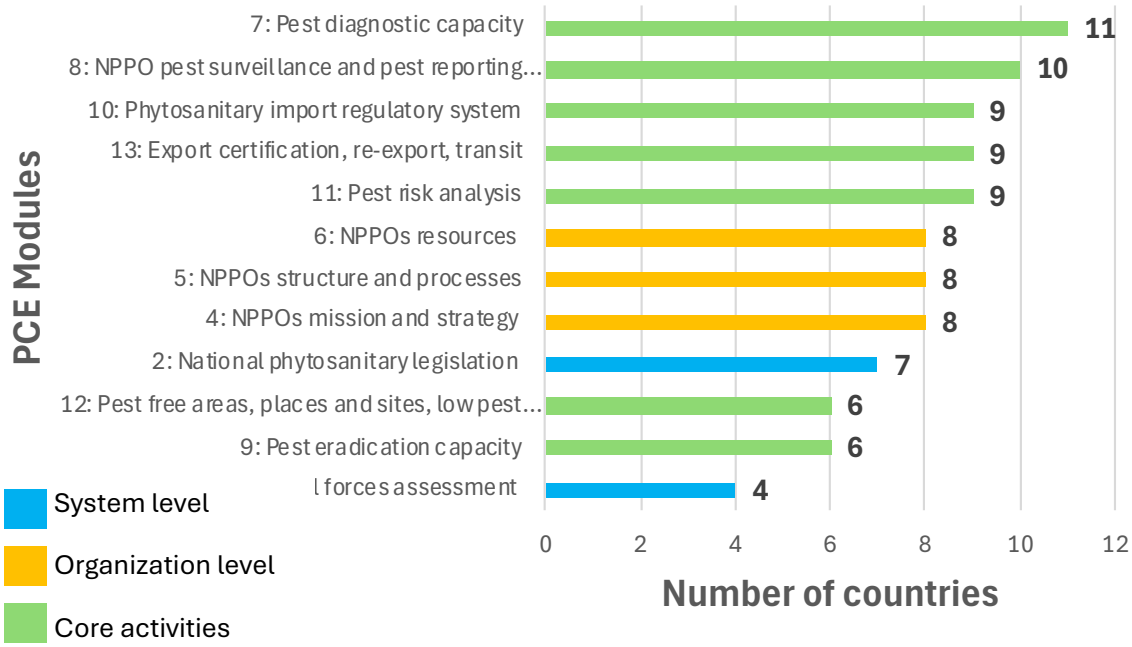


Note: Module 1 (country profile) has not been included in the analysis, as it is mandatory in every PCE process. Consequently, the maximum number of PCE modules displayed in the figure is 12, representing a comprehensive PCE assessment.

Source: IPPC Secretariat.

The most frequently selected modules focus on technical capacity building in diagnostics, surveillance, and risk analysis, reflecting a priority of COMESA countries to strengthen phytosanitary infrastructure. In contrast, the least selected modules related to governance and external environmental assessments, suggesting a current emphasis on operational efficiency over policy engagement and external impact evaluations (Figure 3).

Figure 3: An overview of the most selected PCE modules.

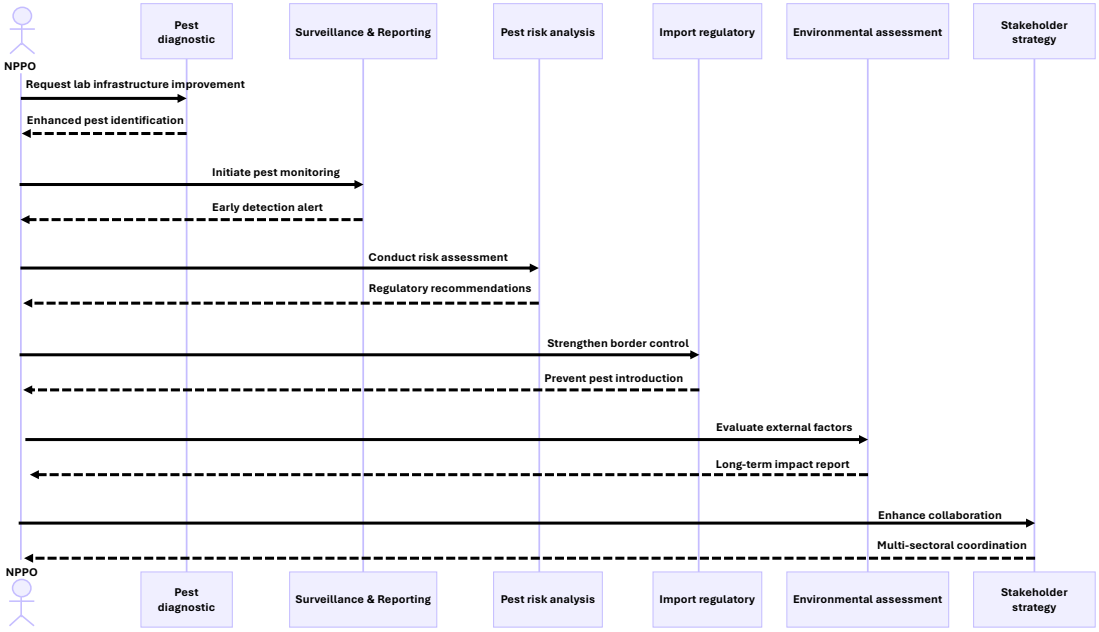


Note: Module 1 (country profile) has not been included in the analysis, as it is a mandatory component of every PCE process. The selection trends highlight the priority areas identified by participating countries, reflecting their commitment to strengthening core phytosanitary functions.

Source: IPPC Secretariat.

The selection trends in PCE modules reveal a strong focus on technical capacity over governance. Countries are prioritizing modules related to pest diagnostics, surveillance, and risk analysis, underscoring their emphasis on the core scientific and operational aspects of phytosanitary management. These modules are critical for enabling early pest detection, ensuring regulatory compliance, and facilitating trade, all of which help NPPOs manage phytosanitary risks and align with international standards. However, the limited selection of governance-related modules, such as national phytosanitary legislation, suggests institutional coordination and policy reform are not being prioritized. Strengthening multi-stakeholder collaboration and governance frameworks could significantly enhance the long-term sustainability and effectiveness of phytosanitary systems, addressing gaps that technical capacity alone cannot resolve.

Figure 4: Selection trends and their significance, highlight of key drivers for decision-making by the country.



Source: IPPC Secretariat.

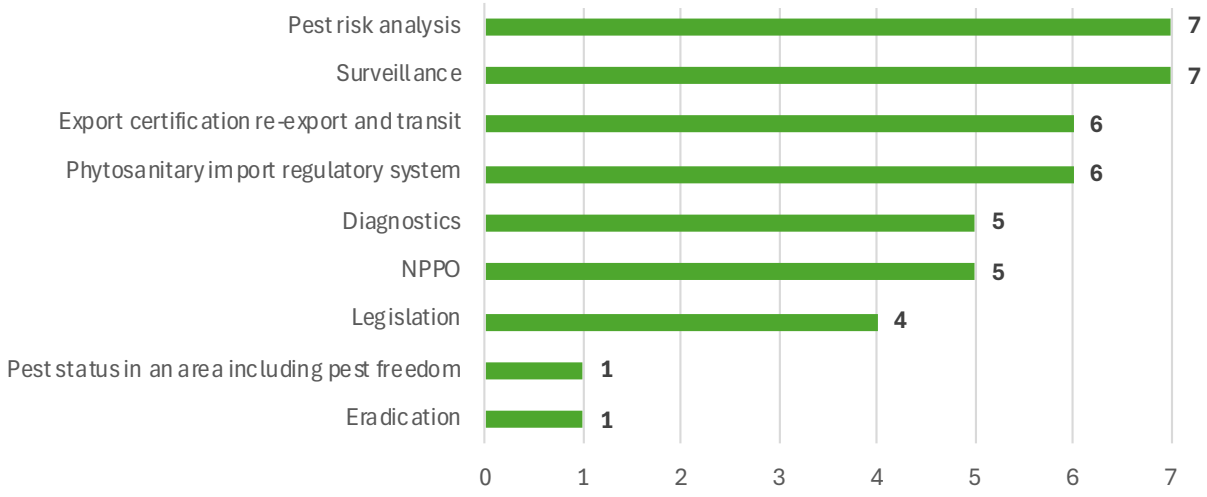
Another key observation is the high selection of the phytosanitary import regulatory system module, reflecting a regional focus on strengthening border controls and import regulations. This indicates an effort to prevent the introduction of plant pests while maintaining efficient trade flows. Effective border inspection systems are critical for ensuring compliance with international trade agreements and minimizing the risk of pest outbreaks from imported goods.

Conversely, external factors such as climate change, trade shifts, and socioeconomic influences received little attention, as reflected in the low selection of the Environmental forces assessment module. While these issues may not be immediate priorities for NPPOs, they could significantly impact plant health policies in the future. Climate change is expected to alter pest distribution patterns and increase the frequency of outbreaks, making it essential for countries to incorporate environmental risk assessments into their long-term phytosanitary planning.

Country needs and capacity development priorities

COMESA countries identified their most pressing capacity development needs based on PCE assessments. Seven out of 11 participating countries prioritized surveillance, pest risk analysis (PRA), and import and export regulatory systems as the top three areas requiring immediate attention. Addressing these key priorities will provide a foundation for sustainable funding and implementation strategies at local, national, sub-regional, and continental levels. Strengthening phytosanitary capacity in these areas will improve regulatory efficiency, safeguard agricultural industries, and facilitate international trade.

Figure 5: Top capacity development priority needs selected by seven countries.



Source: IPPC Secretariat.

PCE key identified weaknesses

The weaknesses are categorized under different PCE modules: identifying gaps in legislation, organizational structures, human resources, infrastructure, and operational efficiency. These challenges, while varying by country, generally fall into the following areas: A major concern is the lack of strong legislative and governance frameworks to support phytosanitary functions. Many NPPOs lack strategic documents, national phytosanitary legislation, and clear mission statements. Additionally, there are insufficient legal provisions for enforcing regulations, collecting service fees, and ensuring compliance with international standards. These gaps limit the ability of NPPOs to function effectively and meet their international obligations.

NPPO structure and resource management is another critical area of concern. Many NPPOs face inadequate staffing, particularly in specialized technical roles, and lack structured audit programmes and internal oversight mechanisms. Additionally, the absence of formal documents defining responsibilities, delegation of authority, and proper organizational structures further weakens institutional efficiency.

Limited funding and financial autonomy also hinder the ability of NPPOs to expand and modernize their operations. In diagnostic and surveillance capacity, several countries reported having obsolete laboratory equipment, inadequate infrastructure, and a lack of trained personnel for pest diagnostics. There is also a shortage of structured in-service training programmes for NPPO staff, along with insufficient resources for pest surveillance and reporting. Furthermore, the lack of standardized pest survey protocols and national databases makes it difficult to monitor and respond to pest threats effectively. Import and export regulatory systems also require significant improvements. Many NPPOs lack standardized phytosanitary import regulatory structures, and border points are often not equipped with specialized sampling and testing tools. Weak enforcement of import control procedures further exacerbates the situation, increasing the risk of pest introductions. In addition, insufficient resources for export certification, including ePhyto,15 pose challenges in meeting international trade requirements.

Another major gap is in pest eradication and risk analysis. Many countries lack formal pest eradication programmes, response strategies, and compensation mechanisms for affected stakeholders. Additionally, PRA functions are often underdeveloped due to a lack of trained personnel, inadequate analytical tools, and weak coordination among relevant institutions. Without strong PRA systems, countries struggle to assess and mitigate risks associated with pest introductions and spread. Infrastructure and IT systems are also lacking across several NPPOs.

Many do not have adequate IT systems for data management and communication, limiting their ability to efficiently store and retrieve phytosanitary information. Documentation remains largely manual, and digitized phytosanitary records are often unavailable. Furthermore, weak research collaboration and limited access to scientific publications further hinder phytosanitary development and innovation.

National gaps and implementation strategy

Strengthening NPPOs is critical to ensuring compliance with international phytosanitary standards and improving trade efficiency. A key priority is to increase awareness of the NPPO's role and responsibilities among policymakers, industry stakeholders, and the public. Enhanced awareness helps secure the necessary support and resources for effective phytosanitary governance. To meet their obligations under the IPPC, NPPOs must also establish sustainable funding mechanisms, such as robust cost-recovery systems. These systems not only ensure long-term financial sustainability but also enable NPPOs to effectively carry out their core functions, including pest surveillance, inspections, certifications, and regulatory enforcement.

Another fundamental priority is the development and implementation of robust phytosanitary legislation. A strong regulatory framework enables NPPOs to enforce phytosanitary measures, facilitate compliance, and align trade practices with international standards. In the absence of clear legislation, NPPOs may struggle to regulate plant health effectively, which can increase the risk of pest introduction and spread, compromising national agriculture and trade security.

Developing strategic frameworks is equally essential for guiding NPPO operations. These frameworks should:

- Align with national trade goals
- Support the implementation of import and export regulatory systems
- Enhance phytosanitary capacity while minimizing trade disruptions

A well-structured NPPO strategy not only streamlines operational procedures but also ensures seamless regulatory compliance, contributing to more resilient plant health systems. To protect agricultural production and biodiversity, strengthening pest surveillance and prevention systems is imperative. Proactive monitoring, timely interventions, and coordinated pest management programmes are essential for safeguarding production areas from emerging pest threats. Investing in early detection, accurate pest identification, and rapid response mechanisms enables NPPOs to prevent potential pest outbreaks before they escalate into significant threats to agriculture and trade.

Additionally, consolidating pest records and national databases is vital for maintaining accurate pest status information. A centralized and well-maintained set of database improves the efficiency of PRA and supports evidence-based decision-making. This kind of data consolidation ensures transparency in phytosanitary compliance, fosters trust among trading partners, and enhances compliance with international trade requirements.

Discussion

The PCE assessment of COMESA countries provides a comprehensive assessment of national plant health systems, identifying both strengths and critical gaps in phytosanitary capacity. The evaluation reveals a clear emphasis on strengthening technical capacity, particularly in areas such as pest diagnostics, surveillance, and import regulations. These aspects are fundamental for detecting, monitoring, and mitigating plant pest risks while ensuring compliance with international trade standards. However, the findings also indicate that governance-related areas, such as policy coherence, institutional coordination, and long-term strategic planning have received comparatively less attention. This trend indicates NPPOs across COMESA countries are prioritizing operational efficiency over broader policy engagement and institutional governance. While technical improvements are crucial for immediate phytosanitary risk management, a lack of strong governance frameworks may pose long-term challenges. Without well-defined policies, regulatory clarity, and stakeholder engagement, even well-developed technical systems may struggle when it comes to sustainability and implementation. Addressing governance gaps is essential for ensuring that phytosanitary improvements are institutionalized and integrated into national agricultural and trade policies.

Key trends in PCE module selection

As discussed above, the selection of PCE modules[11,16] by COMESA countries reveals a strong prioritization of technical phytosanitary functions over broader governance and environmental assessments. This trend underscores the region's focus on enhancing operational capacities critical to pest management and trade facilitation. However, the evaluation results, rather than the selection process alone, provides the most accurate insights into specific gaps and areas for improvement.

Module 7 was selected by all participating countries, reflecting a universal recognition of the need to assess pest diagnostic capabilities. Evaluation results revealed significant gaps in laboratory infrastructure, pest identification tools, and personnel expertise. These findings highlight the urgent need for targeted investments to improve diagnostic accuracy, ensuring effective pest detection and response. Similarly, Module 8 was widely selected, emphasizing the importance of evaluating existing surveillance systems. The assessments identified weaknesses in early pest detection and continuous monitoring, which are critical for preventing outbreaks and maintaining agricultural trade flows. Strengthening these systems is essential to safeguarding both domestic agriculture and international trade. Module 10 also garnered significant attention. Evaluations under this module exposed gaps in border control mechanisms, risk-based inspections, and compliance with international trade agreements. Addressing these issues is vital to mitigating pest introduction and spread, while facilitating efficient trade operations.

In contrast, governance-related modules received less emphasis. The Module 3, which evaluates the impact of external factors such as climate change, shifting trade patterns, and socioeconomic influences, was among the least selected. The limited focus on environmental forces could hinder long-term resilience, particularly as climate variability increasingly affects pest migration and outbreak patterns. Similarly, Module 4 was not a undertaken by many countries. Evaluations revealed that several NPPOs lack comprehensive long-term strategic frameworks to guide institutional development and operational effectiveness. Without such strategies, sustaining capacity-building efforts and adapting to evolving phytosanitary challenges may prove difficult.

The key takeaways highlight that technical capacity building remains a priority, as shown by the widespread selection of modules focused on pest diagnostics, surveillance, and import regulation. However, assessment results reveal specific gaps that demand targeted interventions.

At the same time, governance-related modules and environmental assessments have received limited attention, which could undermine long-term resilience. Addressing these areas is critical to ensure phytosanitary systems can adapt to evolving challenges such as climate change and shifting trade dynamics. While module selection indicates areas of interest, the assessment findings provide the most actionable insights, guiding discussions on urgent needs such as laboratory improvements, surveillance upgrades, and regulatory enhancements. To build robust phytosanitary systems, COMESA countries must balance immediate technical needs with long-term strategic planning, placing greater emphasis on governance and environmental factors to ensure sustainable capacity building and trade facilitation. In conclusion, while the focus on technical modules is a positive step toward addressing immediate challenges, a more comprehensive approach that integrates governance and environmental assessments is essential for long-term resilience and strategic alignment across the region.

Challenges and weaknesses in phytosanitary capacity development

The PCE results across COMESA countries have identified several critical challenges and weaknesses that hinder the effectiveness of NPPOs. These weaknesses span multiple functional areas, including legislation, governance, human resources, infrastructure, surveillance and diagnostics capacities, import/export regulatory frameworks, PRA, and financial sustainability. Addressing these issues is crucial to enhancing phytosanitary capacity, improving regulatory enforcement, and ensuring compliance with international trade standards.

a. Weak legislative and governance frameworks

Many NPPOs operate without updated phytosanitary laws or strategic policy documents, resulting in unclear mandates, weak enforcement mechanisms, and inconsistencies in regulatory application. The absence of legal provisions for regulation enforcement, service fee collection, and compliance with international agreements (such as IPPC and WTO-SPS) further weaken NPPO operations.

Additionally, limited autonomy prevents NPPOs from implementing long-term phytosanitary strategies, as they often rely on broader agricultural ministries that may not prioritize plant health management. Weak governance structures also lead to inefficient decision-making, poor coordination, and an overall lack of strategic direction for phytosanitary capacity development.

b. Structural and operational challenges in NPPOs

NPPOs in many COMESA countries face significant organizational limitations, including:

- Unclear roles and responsibilities, leading to inefficiencies and duplication of efforts.
- Inadequate staffing, particularly in specialized technical roles, such as pest diagnostics, surveillance, and PRA.
- Weak internal oversight and auditing mechanisms, reducing institutional accountability.
- Dependence on government funding or external donors, often leading to inconsistent budget allocations and financial instability.
- These challenges limit NPPOs' ability to expand operations, modernize technology, and implement proactive phytosanitary programmes.

c. Limited diagnostic and surveillance capacity

Effective pest diagnostics and surveillance are essential for early detection, risk assessment, outbreak response, and certifying plants for pest free status in trade. However, many National NPPOs face significant challenges, including:

- Outdated laboratory equipment, which compromises the accuracy and reliability of pest identification.
- Insufficient human resources, with a notable shortage of trained diagnostic specialists.

- Lack of structured training programmes to keep diagnostic expertise up to date with evolving pest threats.
- Inadequate funding for comprehensive nationwide pest surveys, leading to gaps in pest monitoring and reporting.
- Absence of standardized pest survey protocols and national databases, hindering efficient risk assessment and phytosanitary certification processes.

These limitations severely constrain the ability of NPPOs to track pest movements, assess risks, respond promptly to outbreaks, and certify plants for pest free status for imports. As a result, the likelihood of pest incursions and trade disruptions increases, posing significant risks to agricultural productivity and trade stability.

d. Weak import and export regulatory systems

A lack of standardized import and export regulatory frameworks has led to inconsistent enforcement of phytosanitary controls, increasing the risk of pest introductions and non-compliance with phytosanitary import requirements. Common issues include:

- Limited border inspection infrastructure and specialized testing tools, leading to inefficient import control.
- Manual and paper-based certification processes, causing delays and reducing compliance tracking efficiency.
- Weak adoption of electronic phytosanitary certification (ePhyto),[15] a critical tool for streamlining trade.

These gaps compromise market access, lead to rejected consignments, and create obstacles in meeting phytosanitary import requirement.

e. Weak pest eradication and risk analysis systems

Pest risk analysis is a fundamental component to phytosanitary decision-making, yet many COMESA countries lack structured PRA programmes and pest eradication strategies. Key challenges include:

- A shortage of trained personnel to conduct risk assessments.
- Limited tools and data management systems for PRA and pest control planning.
- Weak coordination between NPPOs and research institutions, reducing access to scientific expertise.
- Absence of compensation mechanisms for affected farmers, discouraging compliance with pest eradication measures.

Without a robust PRA framework, NPPOs struggle to assess new pest threats, justify trade restrictions, and develop effective risk mitigation strategies, leading to weakened biosecurity controls and trade inefficiencies.

f. Lack of IT systems and research collaboration

Many NPPOs rely on outdated manual record-keeping systems, limiting their ability to store, retrieve, and efficiently analyse phytosanitary data. Additionally, weak research collaboration and restricted access to scientific publications hinder evidence-based policymaking and limit innovation in phytosanitary management.

Investing in digital data management systems, pest tracking databases, and automated reporting tools would significantly enhance efficiency, data-driven decision-making, and regional information-sharing.

g. Financial sustainability challenges

Most NPPOs rely on unstable government budgets or donor funding, which are often insufficient to support long-term phytosanitary programmes. Without consistent funding, NPPOs face difficulties in:

- Maintaining laboratory infrastructure and surveillance programmes.
- Retaining and hiring skilled personnel for diagnostics and risk assessments.
- Investing in modern pest detection technologies and capacity-building initiatives.

To ensure sustainability, NPPOs should explore cost-recovery mechanisms, increase public–private partnerships, and integrate phytosanitary programmes into national development budgets.

Recommendations

The following recommendations are proposed to enhance phytosanitary governance, capacity development, and regulatory efficiency across COMESA countries. These recommendations focus on strengthening legislative frameworks, improving infrastructure, securing sustainable funding, enhancing stakeholder collaboration, and building technical expertise to ensure effective plant health management and seamless trade (Figure 6).

- **Strengthening legislative and regulatory frameworks:** To improve phytosanitary governance and enforcement, COMESA countries should revise and modernize national phytosanitary laws to align with international standards such as the IPPC and WTO-SPS agreements. Clear legal frameworks will ensure that NPPOs have the necessary authority to implement phytosanitary measures, enforce compliance, and facilitate trade. In addition to updating legislation, countries should define the mandates of NPPOs more clearly, ensuring that their roles and responsibilities are well-documented and understood across government agencies, the private sector, and trade stakeholders. Governments should also establish legal provisions for cost-recovery mechanisms, allowing NPPOs to charge fees for phytosanitary services such as export certifications, import inspections, and diagnostic testing to enhance financial sustainability.
- **Enhancing governance and stakeholder collaboration:** A multi-stakeholder approach is essential for building a cohesive and effective phytosanitary system. To achieve this, countries should establish national phytosanitary steering committees that bring together government agencies, industry representatives, research institutions, and trade organizations to coordinate policies and capacity-building initiatives. Public–private partnerships should be encouraged to leverage industry expertise, financial support, and technological innovation in phytosanitary management. Additionally, countries should strengthen regional collaboration within COMESA to harmonize phytosanitary standards, reduce trade barriers, and develop joint pest surveillance programmes to improve early warning and response mechanisms.
- **Investing in infrastructure and technology:** Modernizing phytosanitary infrastructure is essential to improving diagnostic capabilities, surveillance efficiency, and trade facilitation. COMESA countries should prioritize investing in laboratory facilities, border inspection systems, and pest surveillance technologies to enhance phytosanitary operations. Upgrading laboratory facilities will enable NPPOs to improve diagnostic accuracy, process samples efficiently, and conduct advanced pest risk assessments. Similarly, equipping border inspection points with modern pest detection tools and risk-based inspection systems will strengthen import control measures and reduce trade delays. Countries should also invest in digital phytosanitary systems, including ePhyto, centralized pest surveillance databases, and remote pest monitoring tools. These technologies will enhance regulatory efficiency, improve data sharing, and align phytosanitary systems with **international standards**.
- **Securing sustainable financial mechanisms:** A major challenge faced by NPPOs is the lack of stable and long-term funding. To address this, countries should integrate phytosanitary capacity development into national agricultural budgets, ensuring consistent financial support from governments. Implementing cost-sharing models with private sector stakeholders, such as exporters, importers, and producers can provide an additional revenue stream for phytosanitary services. Countries should also explore international funding opportunities, leveraging grants and technical assistance from organizations such as FAO, IPPC, WTO-SPS, and regional development agencies. Furthermore, financial accountability should be strengthened by developing clear budgetary frameworks,

tracking expenditures, and ensuring transparent financial reporting. This will build trust among donors, government agencies, and private sector partners, encouraging long-term investment in phytosanitary capacity development.

- **Enhancing pest surveillance and risk analysis capabilities:** Early pest detection and accurate risk assessment are crucial for preventing pest spread, safeguarding agriculture, and ensuring trade compliance. To strengthen surveillance and PRA, COMESA countries should standardize pest survey protocols for consistent monitoring and reporting, enabling better data collection and regional coordination. Investing in training programmes will equip surveillance teams with modern pest identification and diagnostic techniques, ensuring efficient risk detection and management. Additionally, establishing centralized pest databases will improve real-time data sharing, analysis, and decision-making, reducing reliance on manual record-keeping and improving outbreak response. Strengthening regional cooperation on PRA will enhance scientific decision-making and risk mitigation, allowing NPPOs to share expertise, harmonize assessments, and develop joint strategies for high-risk pests. Adopting advanced technologies like GIS mapping, remote sensing, and AI-powered pest monitoring will enhance early warning systems, automated risk modelling, and real-time pest tracking, improving accuracy and efficiency in surveillance.
- **Strengthening import and export regulatory systems:** To improve trade facilitation and compliance with **international standards**, countries should modernize their import and export regulatory frameworks. Key recommendations include:
  - » Upgrading border inspection facilities with modern screening tools to improve the efficiency and accuracy of phytosanitary inspections.
  - » Implementing ePhyto to reduce paperwork, streamline trade processes, and enhance traceability.
  - » Adopting risk-based inspection protocols to focus resources on high-risk commodities while facilitating low-risk trade.
  - » Harmonizing phytosanitary measures across COMESA countries to reduce trade barriers and improve market access for agricultural exports.
- **Capacity building and human resource development:** A well-trained workforce is crucial for the success of phytosanitary programmes. To strengthen human resource capacity, COMESA countries should:
  - » Establish mentorship and exchange programmes between NPPOs to facilitate knowledge sharing and best practice adoption.
  - » Promote hybrid training models, combining virtual learning with in-person workshops to maximize accessibility and effectiveness.
  - » Encourage collaboration with universities and research institutions to integrate phytosanitary training into academic programmes.
  - » Develop continuous training programmes for NPPO personnel in areas such as pest diagnostics, risk assessment, and trade compliance.
- **Promoting climate-resilient phytosanitary systems:** Climate change is altering pest distribution patterns and increasing the frequency of pest outbreaks, posing new challenges for phytosanitary management. To enhance resilience, COMESA countries should:
  - » Integrate climate-change considerations into pest surveillance and risk analysis frameworks.
  - » Develop adaptive pest management strategies that consider the impact of changing climate on pest populations.
  - » Enhance research collaboration on climate-driven phytosanitary risks, ensuring science-based decision-making for emerging threats.
- **Establishing a robust monitoring and evaluation system:** To track progress and measure the impact of phytosanitary capacity development initiatives, countries should establish comprehensive monitoring and evaluation (M&E) systems. This should include:
  - » Defining key performance indicators for assessing NPPO effectiveness.
  - » Conducting regular progress reviews and external evaluations to identify challenges and areas for improvement.

» Using stakeholder feedback to refine implementation strategies and ensure responsiveness to emerging phytosanitary challenges.

A well-structured M&E system will enable data-driven decision-making, optimize resource allocation, and enhance accountability in phytosanitary governance.

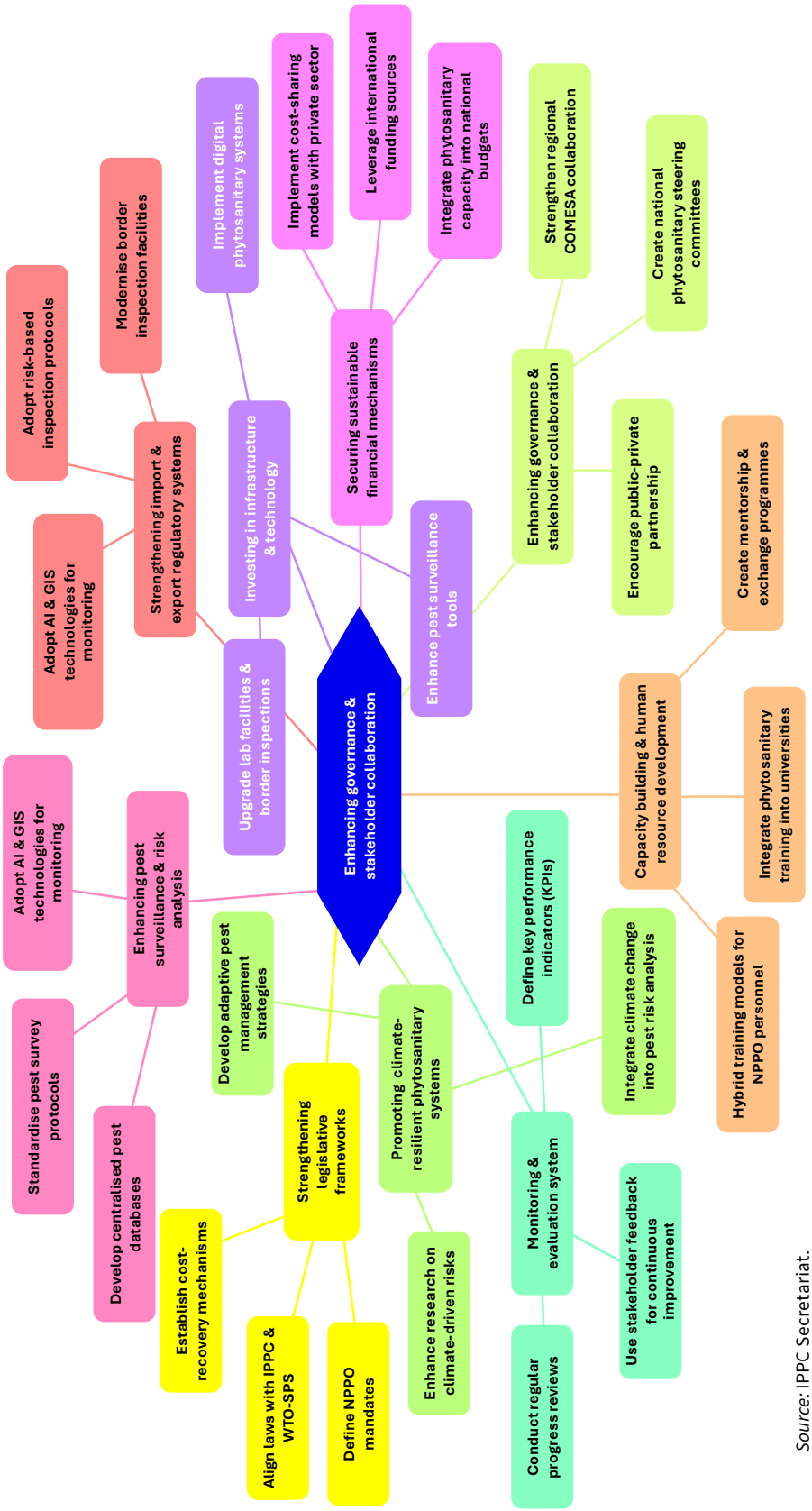


Figure 6: Phytosanitary governance and capacity development recommendations for COMESA countries.

Source: IPPC Secretariat.

Strengthening phytosanitary systems for the future

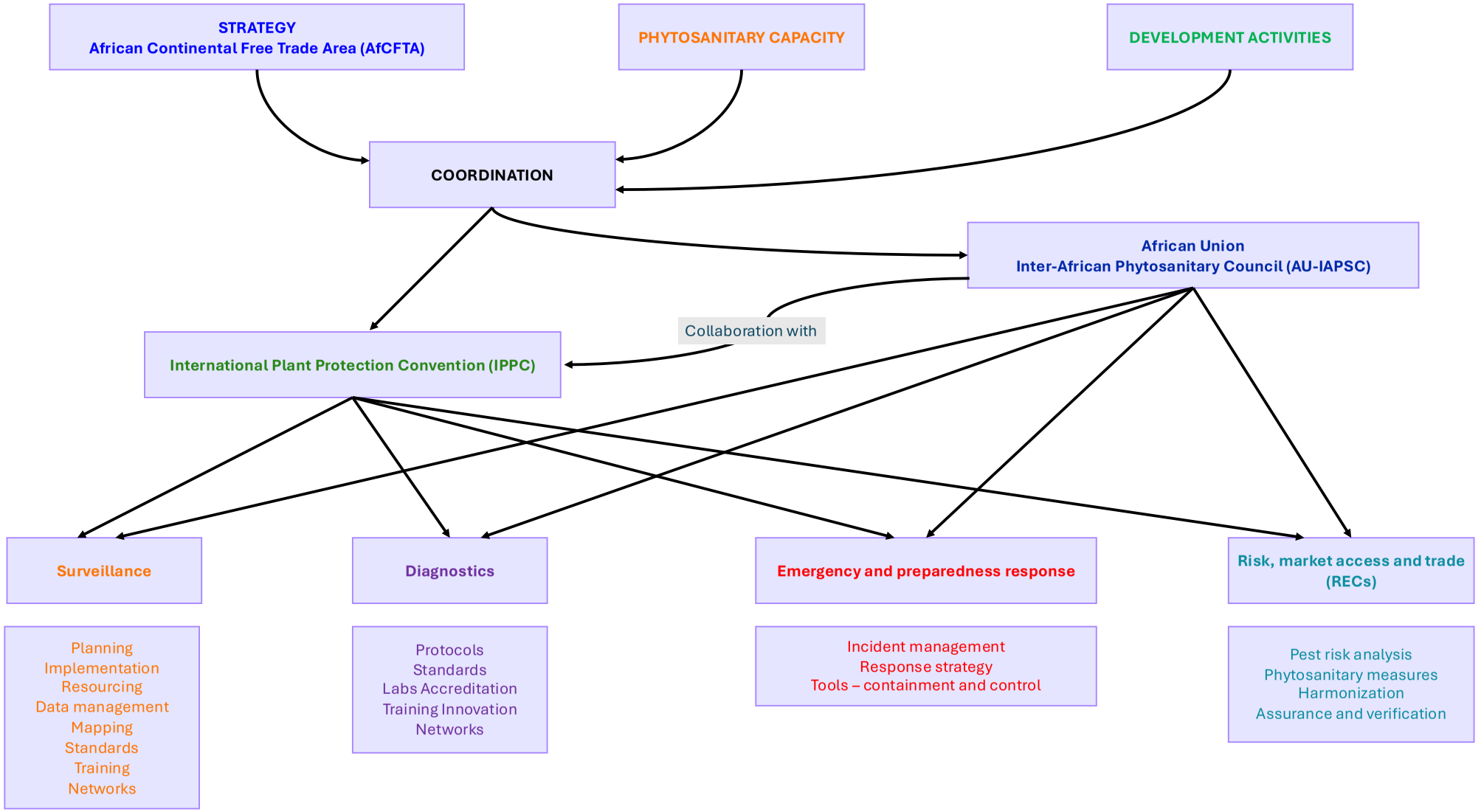
As global trade expands, and the movement of goods and people intensifies, NPPOs facing resource constraints face growing challenges in managing phytosanitary risks. Effective plant health management requires responsive and adaptable phytosanitary systems capable of addressing evolving threats. A sustainable capacity development model should empower regional and national organizations to lead initiatives that address shared needs, priorities, and interests in a coordinated manner.

International organizations, such as the AU-IAPSC,[17] RPPOs[18], and the IPPC[16] play pivotal roles in coordinating these initiatives. Together, they can provide technical leadership and ensure alignment with international standards. A structured regional or continental approach, underpinned by collaboration between AU-IAPSC, IPPC, and RECs[19], will enhance efficiency and impact (Figure 7).

The IPPC, as a global standard-setting body, complements the AU-IAPSC's role as the RPPO for Africa. By working together, these organizations can ensure that phytosanitary capacity-building efforts in Africa adhere to international obligations while addressing regional priorities. This partnership supports the implementation of the PHSA[3] and the AfCFTA,[20] promoting comprehensive phytosanitary measures across the continent.

The proposed framework emphasizes coordination driven by strategic planning to improve countries' phytosanitary capacities through targeted development activities. This model mirrors successful frameworks such as Australia's plant biosecurity system, which aligns overarching strategies with technical implementation committees to ensure national objectives are met. Adapting such models to Africa can strengthen surveillance, diagnostics, and emergency response systems through structured capacity-building streams.

Figure 7: A potential framework for implementing regional and/or continental capacity development in Africa.



Source: IPPC Secretariat.

RECs, such as COMESA, are well-positioned to lead capacity development efforts. Their mandate for trade facilitation and regulatory alignment enables them to drive technical capacity-building activities that meet IPPC obligations and align with global agreements like the WTO-SPS and the Trade Facilitation Agreement.[21] By fostering mutual recognition, risk-based systems, and harmonized phytosanitary measures, RECs support both AfCFTA and PHSA objectives, enhancing trade efficiency and biosecurity. Collaboration with research institutions, plant breeding programmes, and agricultural innovation initiatives further enriches capacity development. These partnerships can drive innovation, develop tailored training modules, and ensure alignment with global phytosanitary standards.

Africa can benefit from proven phytosanitary capacity-building models implemented in other regions. Adopting reference materials, standards, and training programmes from global resources, such as those developed by the IPPC streamlines efforts, reduces duplication, and maximizes donor investments. This ensures capacity building focuses on addressing critical gaps rather than replicating past initiatives, leading to more impactful outcomes.

Achieving long-term improvements in phytosanitary capacity requires:

- Defined activities and measurable outcomes to track progress effectively.
- Milestone-based project management with integrated risk assessments.
- Robust M&E systems to measure impact and guide adjustments.
- Transparent stakeholder engagement to build confidence and secure long-term funding.

A major challenge in Africa is coordinating diverse phytosanitary capacity-building initiatives to effectively implement the PHSA. Strategic efforts should focus on:

- Enhancing transparency in investment planning.
- Aligning short-, medium-, and long-term initiatives to prevent fragmentation.
- Identifying and addressing capacity gaps at both national and regional levels.

By streamlining investments and harmonizing donor contributions, resources can be allocated

efficiently to support a collective regional strategy that benefits all member countries.

Building regional training and development hubs across Africa, supported by a consortium of donors, will:

- Provide continuous training and technical support to NPPOs.
- Facilitate knowledge-sharing and expertise exchange between African countries.
- Strengthen resilience and compliance with IPPC standards and other international phytosanitary regulations.

These hubs will play a critical role in ensuring that Africa's phytosanitary systems remain robust, adaptable, and capable of supporting safe trade and food security in the face of evolving global challenges

Notes

1. **FAO (Food and Agriculture Organization of the United Nations).** 2021. *FAO strategic framework 2022–2031.* Rome. https://openknowledge.fao.org/handle/20.500.14283/cb7099en
2. **IPPC (International Plant Protection Convention Secretariat). 2021.** *Strategic Framework for the International Plant Protection Convention 2020-2030.* Rome. https://www.ippc.int/en/strategic-objectives/ippc-strategic-framework/
3. **AU-IAPSC (African Union Inter-African Phytosanitary Council).** 2022. *Plant Health Strategy for Africa 2022-2036.* Yaounde. https://www.ethioeyewitness.com/wp-content/uploads/2024/08/PLANT-HEALTH-STRATEGY-FOR-AFRICA-ENGLISH-VERSION-1.pdf
4. **UN (United Nations).** 2015. *Sustainable Development Goal 12: Ensure sustainable consumption and production patterns.* New York. https://www.un.org/sustainabledevelopment/sustainable-consumption-production/
5. **FAO (Food and Agriculture Organization of the United Nations).** 2021. *The State of Food Security and Nutrition in the World 2021.* Rome. https://www.fao.org/interactive/state-of-food-security-nutrition/2021/en/
6. **UN (United Nations).** 2015. *Sustainable Development Goal 17: Revitalize the global partnership for sustainable development.* New York. https://globalgoals.org/goals/17-partnerships-for-the-goals/
7. **AU (African Union).** 2019. *Sanitary and Phytosanitary (SPS) Policy Framework for Africa.* Addis Ababa. https://au.int/en/documents/20191004/sanitary-and-phytosanitary-sps-policy-framework-africa
8. **CSR (Council on Strategic Risks).** 2024. *Pest and Pathogen Threats to Food Security.* Washington, D.C. https://councilonstrategicrisks.org/2024/06/13/pest-and-pathogen-threats-to-food-security/
9. **COMESA (Common Market for Eastern and Southern Africa).** 2022. *Annual Report.* https://www.comesa.int/wp-content/uploads/2024/02/COMESA-2022-ANNUAL-REPORT_-ENG.pdf
10. **WTO (World Trade Organization).** 2025. *Tariff & Trade Data.* Geneva. https://ttd.wto.org/en/data/idb
11. **IPPC Secretariat (International Plant Protection Convention Secretariat).** 2025. *Phytosanitary Capacity Evaluation (PCE).* Rome. https://www.ippc.int/en/about/core-activities/capacity-development/phytosanitary-capacity-evaluation/
12. **IPPC Secretariat (International Plant Protection Convention Secretariat).** 2025. *List of NPPOs of IPPC Contracting parties.* Rome. https://www.ippc.int/en/countries/nppos/list-countries/
13. **IPPC Secretariat (International Plant Protection Convention Secretariat).** 1997. *International Plant Protection Convention.* https://www.ippc.int/en/publications/131/
14. **WTO (World Trade Organization).** 1995. *Agreement on the Application of Sanitary and Phytosanitary Measures.* Geneva. https://www.wto.org/english/docs_e/legal_e/downloads_e/SPS_en.pdf
15. **IPPC Secretariat (International Plant Protection Convention Secretariat).** 2025. *IPPC ePhyto Solution.* Rome. https://www.ippc.int/en/ephyto/
16. **IPPC Secretariat (International Plant Protection Convention Secretariat).** 2025. *PCE Modules.* Rome. https://www.ippc.int/en/about/core-activities/capacity-development/phytosanitary-capacity-evaluation/
17. **AU-IAPSC (African Union Inter-African Phytosanitary Council).** 2025. *African Union Inter-African Phytosanitary Council.* Yaounde. https://www.ippc.int/en/ippc-community/regional-plant-protection-organizations/interafricanphytosanitarycouncil/
18. **IPPC Secretariat (International Plant Protection Convention Secretariat).** 2025. *Regional plant protection organizations.* Rome. https://www.ippc.int/en/ippc-community/regional-plant-protection-organizations/

19. **AU (African Union).** 2025. *Regional Economic Communities.* Addis Ababa. https://au.int/en/recs
20. **AfCFTA (African Continental Free Trade Area).** 2025. *Addis Ababa African Continental Free Trade Area.* https://au-afcfta.org/
21. **WTO (World Trade Organization).** 2025. *Trade facilitation.* Geneva. https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm

IPPC

The International Plant Protection Convention (IPPC) is an international plant-health agreement that aims to protect global plant resources and facilitate safe trade. The IPPC vision is that all countries have the capacity to implement harmonized measures to prevent pest introductions and spread, and minimize the impacts of pests on food security, trade, economic growth, and the environment.

Organization

- There are over 180 IPPC contracting parties.
- Each contracting party has a national plant protection organization (NPPO) and an official IPPC contact point.
- Ten regional plant protection organizations have been established to coordinate NPPOs in various regions of the world.
- The IPPC Secretariat liaises with relevant international organizations to help build regional and national capacities.
- The secretariat is provided by the Food and Agriculture Organization of the United Nations (FAO).

Did you read this guide?
Please send an email to ippc@fao.org and share your feedback.

Your responses will help the IPPC Secretariat and the IPPC Commission on Phytosanitary Measures (CPM) Implementation and Capacity Development Committee (IC) strengthen this and other guides and training resources.

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