Asia - Pacific Association of Agricultural Research Institutions

Innovation Shaping the Future of Agriculture and Safe Trade: Learnings from Pesticide Management in Asia and the Pacific

Perspectives from

‘Asia Pesticides Residue Mitigation through the Promotion of Biopesticides’

(STDF Project)

Asia - Pacific Biopesticides Community of Practice (ABCoP)

Community of Practice for Public Private Partnership (CoP PPP)

APAARI Team

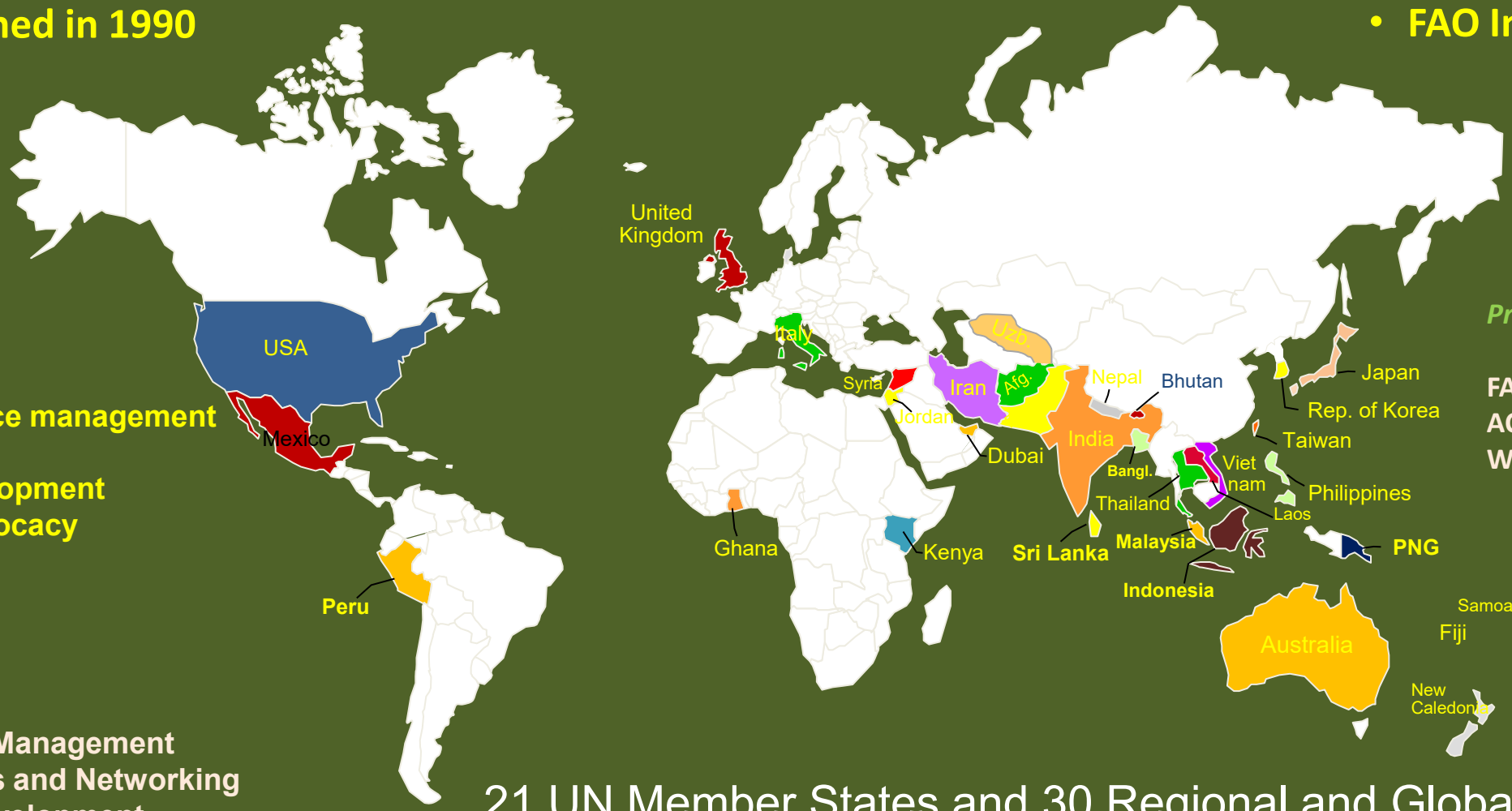
Asia-Pacific Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand

APAARI

Strengthening Agri-food research and innovations for sustainable agricultural development in Asia and the Pacific

Apolitical, membership based, multistakeholder platform

- **Established in 1990**
- **FAO Initiative**



Thematic areas

- **Natural resource management**
- **Risk mitigation**
- **Inclusive development**
- **Policy and advocacy**

Project sponsors

FAO , STDF, EU, AFD, ACIAR/IFPRI, USDA, World Bank, GFAiR

Key Programmes

- **Knowledge Management**
- **Partnerships and Networking**
- **Capacity Development**
- **Policy and Advocacy**

21 UN Member States and 30 Regional and Global agencies

Biopesticides- A Recap

Biopesticides are naturally occurring substances (biochemical pesticides), microorganisms (microbial pesticides), or plant incorporated protectants (PIPs) that control pests by non toxic mechanisms and are typically target-specific

Biopesticides naturally fit into IPM systems because they:

- Are specific to target pests
- Preserve beneficial organisms
- Decompose quickly
- Help reduce chemical residues

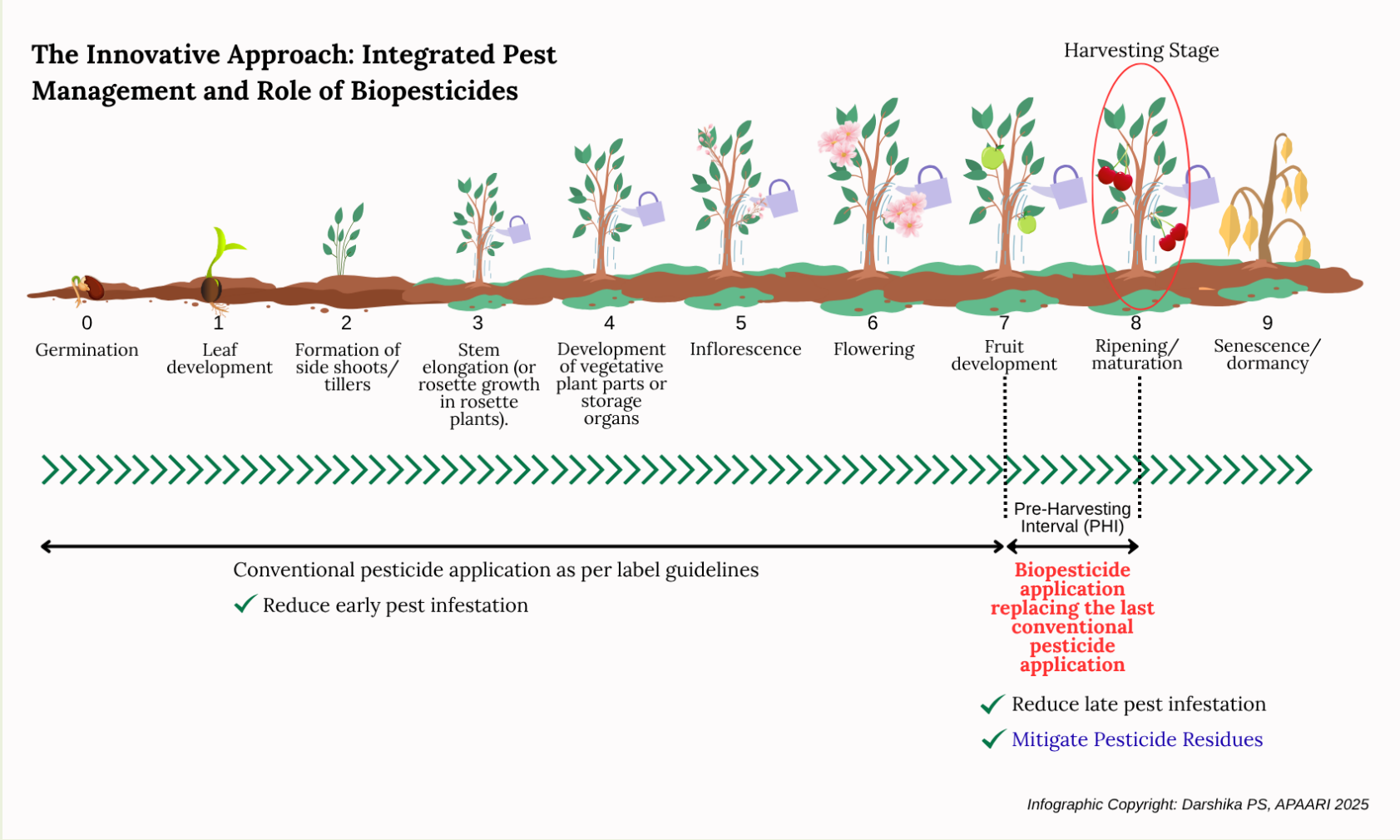
Source: U.S. EPA, 2024

STDF/PG/634 - Asia Pesticides Residue Mitigation through the promotion of Biopesticides and Enhancement of Trade opportunities

Objective	• Increase awareness of how pesticide residue issues impact trade and develop methods for overcoming these trade barriers
Beneficiary countries	• **Bangladesh, Cambodia, Indonesia, Lao PDR, Malaysia, Sri Lanka, Thailand, Vietnam**
Funding Agency	• **Standards and Trade Development Facility (STDF)**
Implementing Agencies	• Asia-Pacific Association of Agricultural Research Institutions (APAARI), AgAligned Global, United States Department of Agriculture (USDA)
Partners	• **Singapore Food Agency, Asia Farmers Association for Sustainable Rural Development (AFA), CropLife Asia**

Lesson 1
Innovative Approach - Integrated Pest Management (IPM)

Projects's innovative approach — **substituting the final conventional spray with a biopesticide** — has been validated as an effective residue mitigation strategy for horticultural crops while controlling pests during the pre-harvest interval (PHI)



Source : APAARI, 2024 and BBCH scale

Lesson 2
Generation of MRL data through GFP, GLP and ToT

- A key lesson learned was that both technical and functional capacity development were essential for achieving the project's objectives.
  - ✓ Over **170 government officers** were equipped with enhanced technical capacities (knowledge) and functional capacities (soft skills) on residue mitigation studies, biopesticide production, and regulatory harmonization
  - ✓ Implemented across eight countries in South and Southeast Asia, successfully developed **18 standardized protocols** for four major commercial crops—cabbage, sweet basil, dragon fruit, and chili pepper.
  - ✓ Proper use of biopesticides toward the end of the growing season **reduced pesticide residue levels by up to 50%.**

- All workshops and trainings were carried out following Good Field Practices (GFP) and Good Laboratory Practice (GLP) to enance knowledge gaps and practical skills.

- The Policy Brief was developed to highlight key policy recommendations.

Source: APAARI, 2024

Training of Trainers

- Adopting a Training of Trainers (ToT) approach proved highly effective in building capacity across participating countries. This was further strengthened through South-South Cooperation (SSC) and active knowledge exchange
  - ✓ Relevant government officials were trained by a Field Residue Research lead, Laboratory Residue Research Lead, Quality Assurance Specialist, and Biopesticide/Efficacy Research Lead (ToT)
  - ✓ Experts from Thailand visited and supported residue mitigation studies in Lao PDR, further strengthening South-South collaboration.

Source: APAARI, 2024

GLPTraining at Singapore food Agency(APAARI,2024)

Biopesticides Manufacturing Workshop/Training at Vietnam (APAARI,2024)

Lesson 3
Regulatory Frameworks and Harmonization

- **ASEAN Countries:**
  - Indonesia, Thailand, Malaysia, and Vietnam have developed national biopesticide regulations aligned and harmonized with ASEAN guidelines through the Biopesticide Regulatory Workshop.
  - Cambodia and Lao PDR were sensitized to establish national biopesticide regulations in alignment with the ASEAN guidelines

- **Non-ASEAN Countries:**
  - Sri Lanka: Currently has no biopesticide regulations, and harmonization with ASEAN guidelines has not yet materialized.
  - Bangladesh: Through APAARI–USDA Phytosanitary collaboration, revised biopesticide guidelines have been developed and are in the final stages of government approval.
  - Pakistan: Under the USDA–CABI project, biopesticide regulations have been approved by the Government of Pakistan.

Source: APAARI, 2024

Lesson 4
Public Private Partnership for Biopesticides

- Asia Pacific Biopesticides Community of Practice (ABCoP) was initiated as a part of the Project's Sustainability Plan and later also a CoP PPP

- There are several example for Sustainable Pest Management Practices via Public Private Partnerships
  - ✓ The successful development and commercialization of Entomopathogenic Nematode (EPN) technology in India highlights its potential as a sustainable biopesticide. Supported by the National Bureau of Agricultural Insect Resources (NBAIR), **the innovation has been licensed to multiple companies**.

  - ✓ Biocontrol technology leaders (Ex: Bionema Group) focuses on unlocking the full potential of biopesticides by **developing advanced technologies and transferring them to partners for commercialization**.

  - ✓ **CABI Bioprotection Portal,** etc

Key Conclusions

- Sustainable horticultural production depends on the judicious, informed, and science-based use of both chemical and biological pesticides.
- Replacing the final chemical application with a biopesticide can maintain pest control efficacy while reducing residues to within Codex MRLs, thereby ensuring food safety and compliance with international standards.
- The integration of Good Field Practices (GFP), Good Laboratory Practices (GLP), and Codex Alimentarius guidelines strengthens regulatory compliance, enhances consumer trust, and increases export potential.
- Projects and virtual platforms play a vital role in capacity building, harmonizing protocols, and promoting cross-country collaboration for the adoption of sustainable pest management practices.

Thank you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Key Questions / Discussion Points

- ❑ Do we have sufficient R&D activity in countries/region on biopesticides (microbial, botanical, etc.) ? If not, what is needed?
- ❑ Are manufacturers supported with adequate regulatory clarity and incentives to produce biopesticides locally?
- ❑ Do scientists have the functional skills (regulatory science, product development, quality control, data for trade) to fully participate in and advance biopesticide development?
- ❑ How well do scientists / extension agents communicate with private sector, policymakers and farmers on biopesticide potential and safe use?
- ❑ What actions can be prioritized short-term vs long-term (e.g. regulatory reform, demonstration trials, public awareness)?