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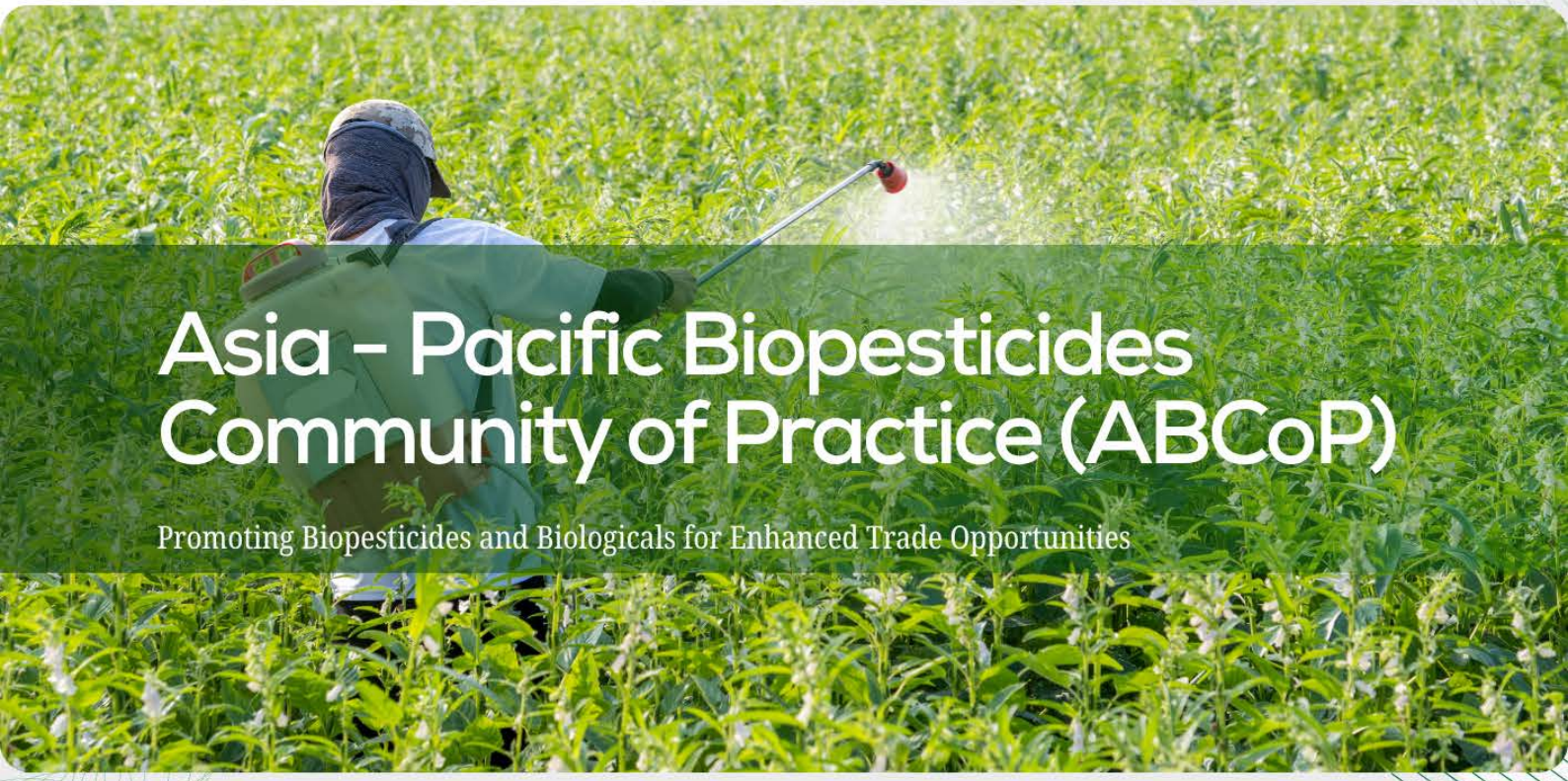

Asia - Pacific Biopesticides Community of Practice (ABCoP)

Promoting Biopesticides and Biologicals for Enhanced Trade Opportunities

Speaker:

Jagdish Jaba

Scientist & Lead- Entomology
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India

Topic: Advancing biopesticides for Dryland Crops: Present insights and future pathways in Asia & Africa

Speaker:

Rajendra Dhakal

Climate Resilent Analyst Livelihood
International Centre for Integrated Mountain Development (ICIMOD) Nepal

Topic: Nature-based Solutions for Sustainable Pest Management: Lessons from the Hindu Kush Himalaya (HKH) Region.

01 JULY, 2026

02:00 PM - 03:00 PM
(Bangkok Time)

"ABCoP 2026: Expanding from Biopesticides to Biologicals."

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Presentation 1: Advancing biopesticides for Dryland Crops: Present insights and future pathways in Asia & Africa

Speaker: Jagdisha Jaba, Scientist & Lead- Entomology International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India

Summary: Dr. Jagdish Jaba presented an overview of ICRISAT's research on **biopesticides for sustainable pest management** in Asia and Africa, with a particular focus on **dryland agriculture.**

- Importance of Dryland Agriculture: ICRISAT works primarily in semi-arid tropical regions where crops such as sorghum, chickpea, pigeon pea, groundnut, and millets are grown. These regions support around 2 billion people but face challenges including climate change, drought, soil degradation, invasive pests, and limited agricultural infrastructure.
- Challenges for Farmers: Smallholder farmers in Asia and Africa face pest outbreaks due to monocropping, limited mechanization, poor market access, inadequate post-harvest facilities, and increasing production costs. Crop losses from insect pests can range from 30–90%, while post-harvest losses are also substantial.
- Limitations of Conventional Pesticides: Overreliance on chemical pesticides has resulted in pesticide resistance, residue issues, biodiversity loss, risks to pollinators, environmental contamination, and higher production costs. Increasingly stringent international food safety standards have also led to export rejections due to excessive pesticide residues.
- Growing Importance of Biopesticides: Biopesticides—including microbial products, botanicals, biochemical pesticides, natural enemies, and entomopathogenic nematodes—offer environmentally friendly alternatives. The global biologicals market is expanding rapidly, driven by demand for safer food, organic production, integrated pest management (IPM), and climate-smart agriculture.
- Current Status and Market Trends: While adoption of biopesticides is increasing in India and globally, their market share remains relatively small compared with conventional pesticides. Challenges include product quality, formulation stability, farmer awareness, and regulatory delays.
- Research and Case Studies: Dr. Jaba highlighted ICRISAT's work on microbial biopesticides, botanical extracts such as neem, efficacy studies in Asia and Africa, and the successful use of biological agents against key insect pests. He also discussed emerging technologies, including RNA-based biopesticides, nanotechnology, drones, and precision agriculture, as future directions for sustainable pest management.
- Key Recommendations: He emphasized the need to strengthen research, improve product quality, streamline regulatory approval processes, promote policy support, and enhance collaboration between Asia and Africa to accelerate the adoption of biopesticides and improve agricultural sustainability and export competitiveness.

Presentation 2: Nature-based Solutions for Sustainable Pest Management: Lessons from the Hindu Kush Himalaya (HKH) Region.

Speaker: Rajendra Dhakal, Climate Resilient Analyst, Livelihood, International Centre for Integrated Mountain Development (ICIMOD), Nepal

Summary: Mr. Rajendra Dhakal of ICIMOD discussed how **nature-based solutions (NbS)** can provide sustainable alternatives to chemical pesticides for pest management in **the Hindu Kush Himalaya (HKH) region**, emphasizing the need to restore traditional knowledge and strengthen biological approaches.

- Growing Pest Challenges: Climate change is accelerating pest outbreaks by expanding pest habitats, disrupting the synchronization between pests and their natural enemies, and increasing pest pressure on mountain farming systems. Around 30–40% of annual crop losses are attributed to pests and diseases, affecting the livelihoods of over 220 million people dependent on mountain agriculture.
- Consequences of Chemical Pesticide Dependence: The increasing reliance on chemical pesticides has led to higher pesticide imports, health risks such as acute poisoning and cancer, pesticide residues in food, water contamination, biodiversity loss, soil degradation, and the emergence of pesticide-resistant "super pests." It also creates economic burdens for farmers through higher input costs and export rejections due to excessive residues.
- Nature-Based Solutions as Sustainable Alternatives: He highlighted biological control agents, habitat management, botanical pesticides, and ecosystem-based approaches as long-term solutions for pest management. Living biological agents can adapt to changing environmental conditions, making them more resilient than chemical pesticides.
- Evidence of Effectiveness: Research from the region demonstrates the successful use of predatory mites, microbial biopesticides, *Trichoderma*, *Metarhizium*, *Trichogramma*, and Nuclear Polyhedrosis Virus (NPV) in controlling major crop pests. Indigenous botanical formulations and fermented plant extracts have also shown promising results for sustainable pest management.
- Role of Traditional Knowledge and Biodiversity: Mr. Dhakal emphasized conserving traditional crop varieties, which possess natural resistance to pests and climate stresses. Practices such as intercropping, mixed cropping, and indigenous botanical pesticides are time-tested approaches that enhance biodiversity and strengthen natural pest regulation.
- Economic and Environmental Benefits: Nature-based solutions can reduce production costs, improve farmers' incomes through premium prices for safe food, create rural enterprises producing biological inputs, and generate broader ecosystem benefits, including improved biodiversity, water quality, pollination, and climate resilience.
- Challenges to Adoption: Key barriers include limited financial incentives, insufficient policy support, lack of awareness among extension workers, labour requirements, and difficulties in commercializing biological products due to their short shelf life and location-specific effectiveness.
- Recommendations: He called for greater investment in nature-based solutions, stronger policy support, carbon credit and ecosystem service payment schemes, conservation of traditional knowledge and crop diversity, enhanced farmer training through Community Learning Centres, and stronger research and extension systems to accelerate adoption across the HKH region.