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Mainstreaming biological control in fall armyworm management

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Fall armyworm is one of the top 10 plant pests and diseases affecting global food and agriculture (CABI, 2017)

Background: Fall armyworm

- ***Origin from Latin America:*** One of major plant insect pests with *three key characters:*

  →***High reproductivity：*** 1,000 eggs / female moth

  →***Wide host range:*** Over 80 crops

  →***Distant migration:*** Over 100 km / d

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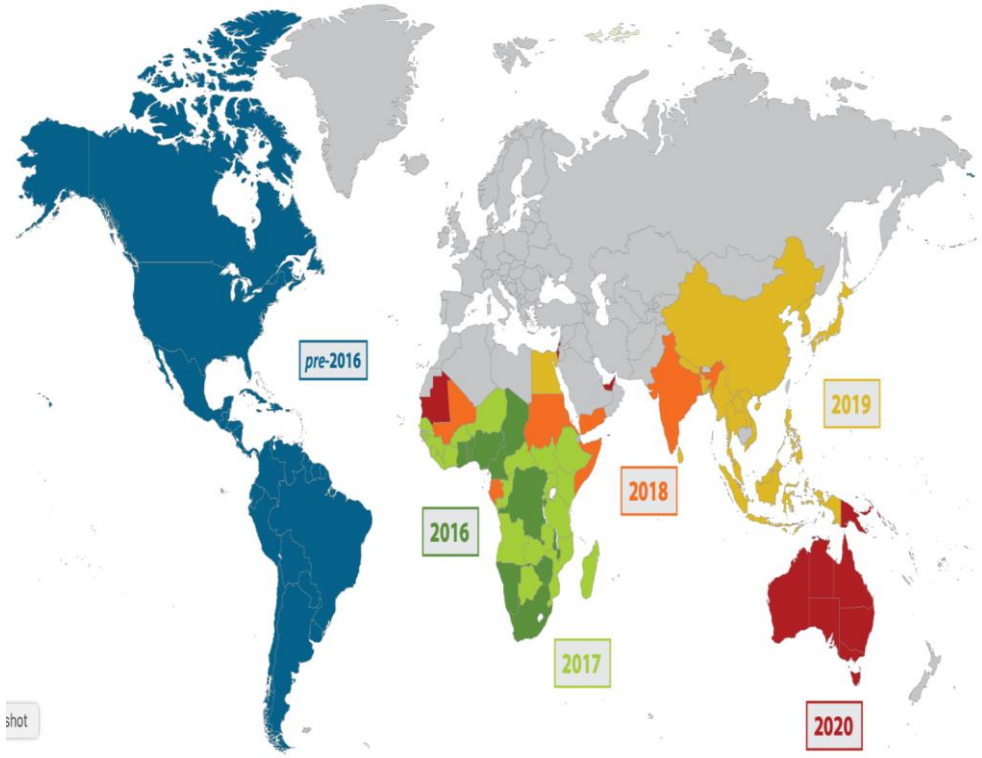
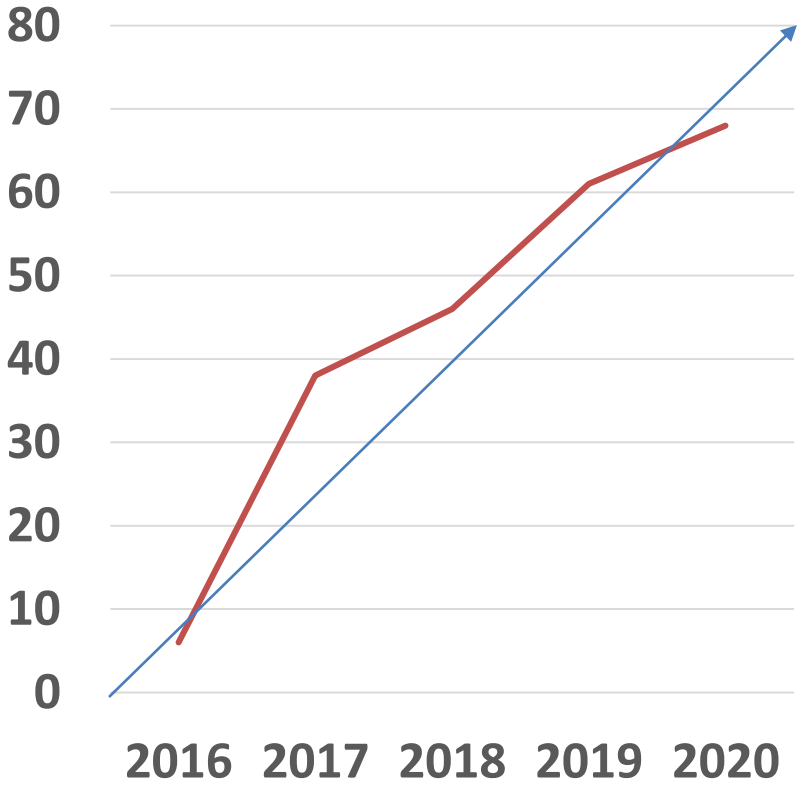
Background: Global Invasion





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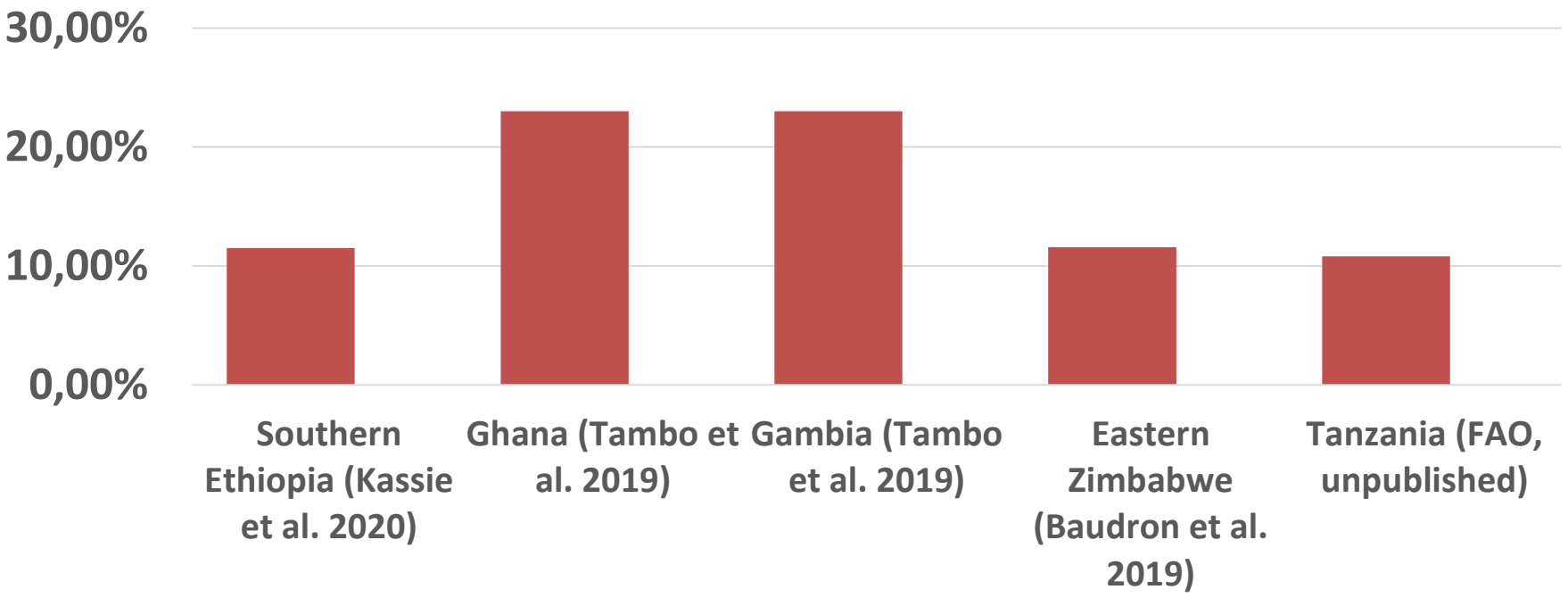
Background: Damage

80 million tons of maize worth **USD 18 billion** per year in Africa, Asia and Near East, and nearly **600 million people** affected



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Global Action for Fall Armyworm Control

- Launched in December 2019 to provide a global coordination platform
- **SC:** Chaired by FAO DG; 23 members; two meetings
- **TC:** Chaired Robert (Chief Scientist of USAID); 7 TGs with 50 members; three meetings – Global IPM assessment in summer 2020

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Objective: Reduction of crop losses

- ***Target:*** Crop yield losses to be reduced by 5% in all demonstration countries and 10% pilot countries
- ***Strategy:*** Region (Area)-specific IPM package
- ***Regions:*** Africa, Asia and Near East

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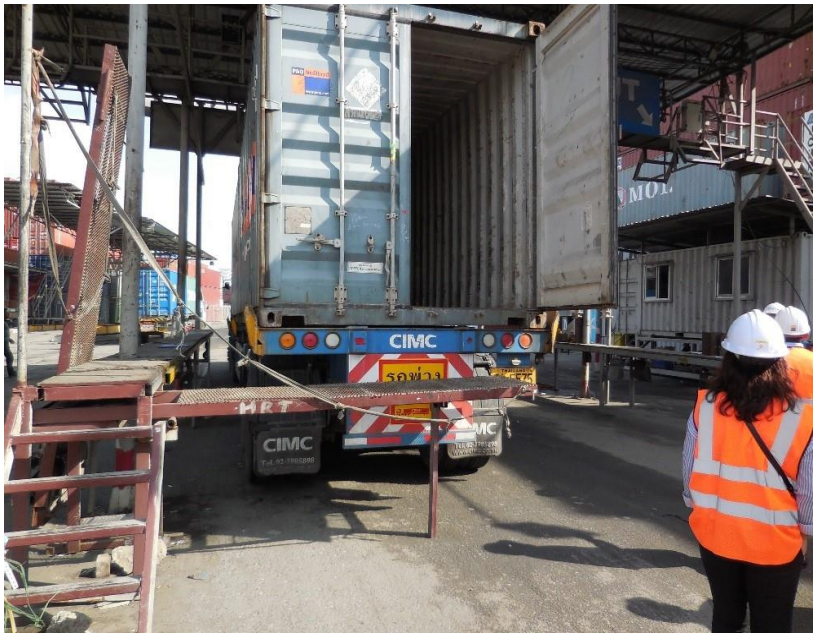
Objective: Prevention/delay of further spread

- ***Target***: Risk reduced for further spread to uninvaded countries
- ***Strategy:*** Phytosanitary measures
- ***Regions:*** South Pacific, South Europe and Near East



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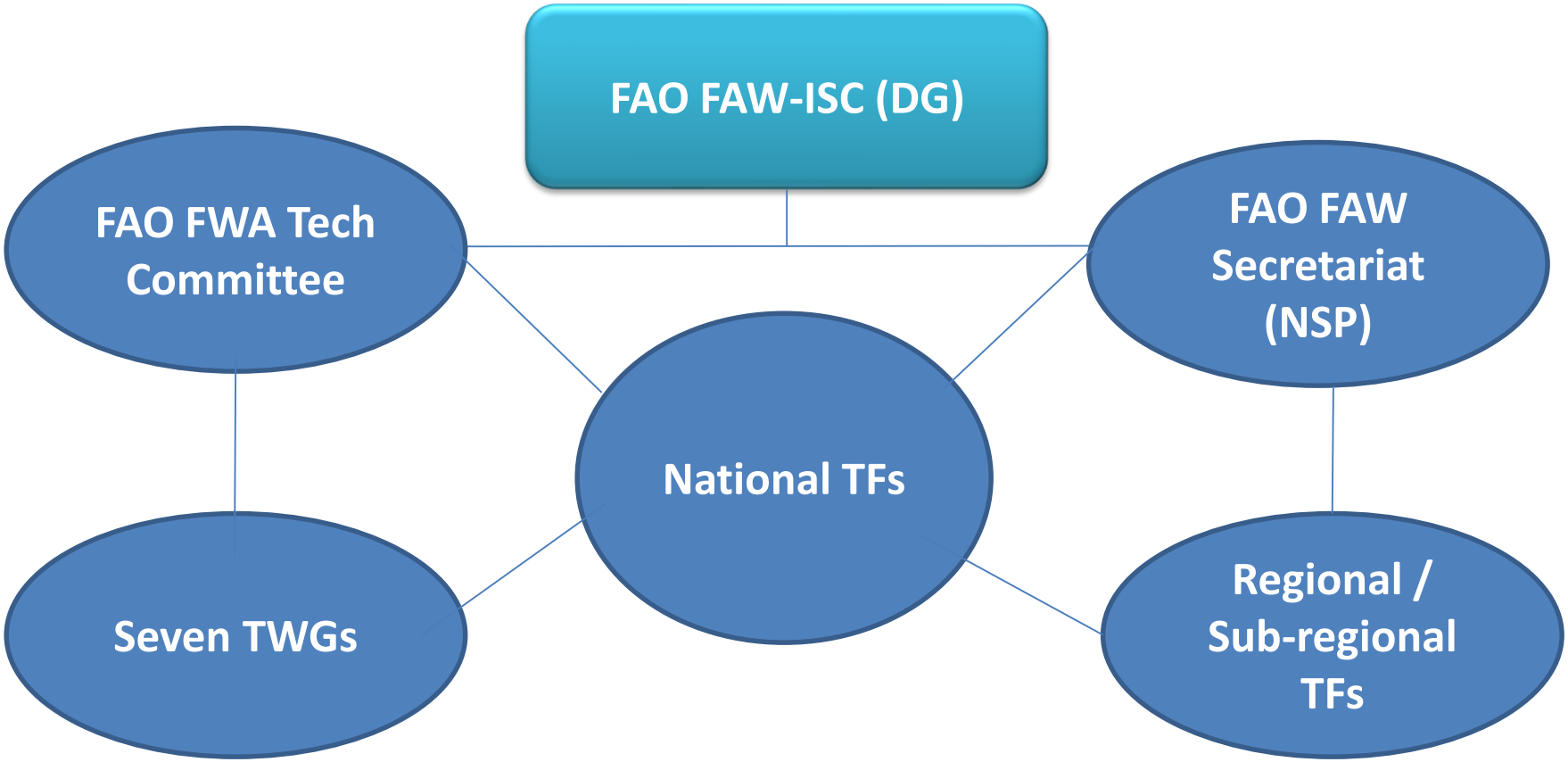
Objective: Global Coordination



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Potential economic outcomes

- ***Reduce*** crop loss
- ***Save*** pesticide cost
- ***Save*** labor cost

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Potential environmental outcomes

- ***Protect environment*** resulted from reduction of pesticide application
- ***Preserve natural enemies*** resulted from reduction of pesticide application

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Potential social outcomes

- ***Enhance farmer's capacity*** for promoting sustainable FAW management
- ***Strengthen institutional capacity*** for coordinating emergent control of emerging plant pests

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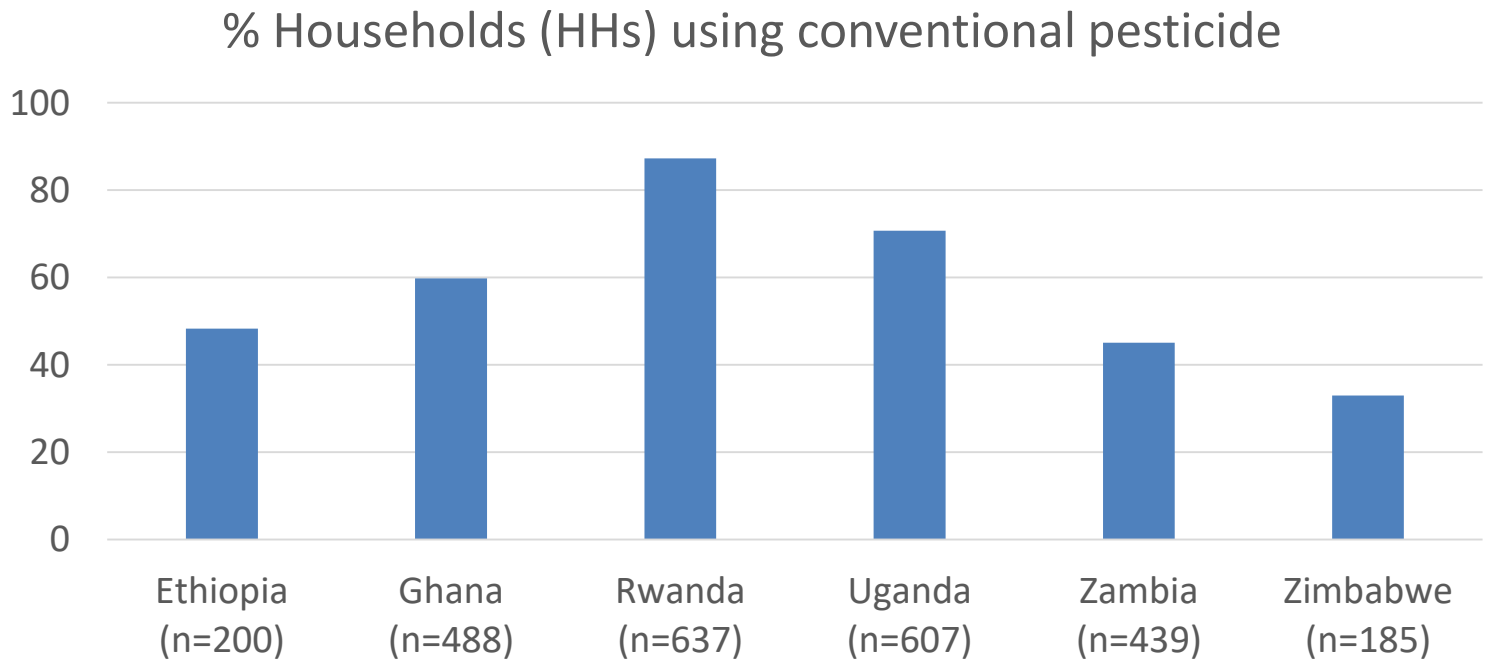
Conventional pesticides as the predominant management techniques



Kumela et al. 2018

Tambo et al. 2020

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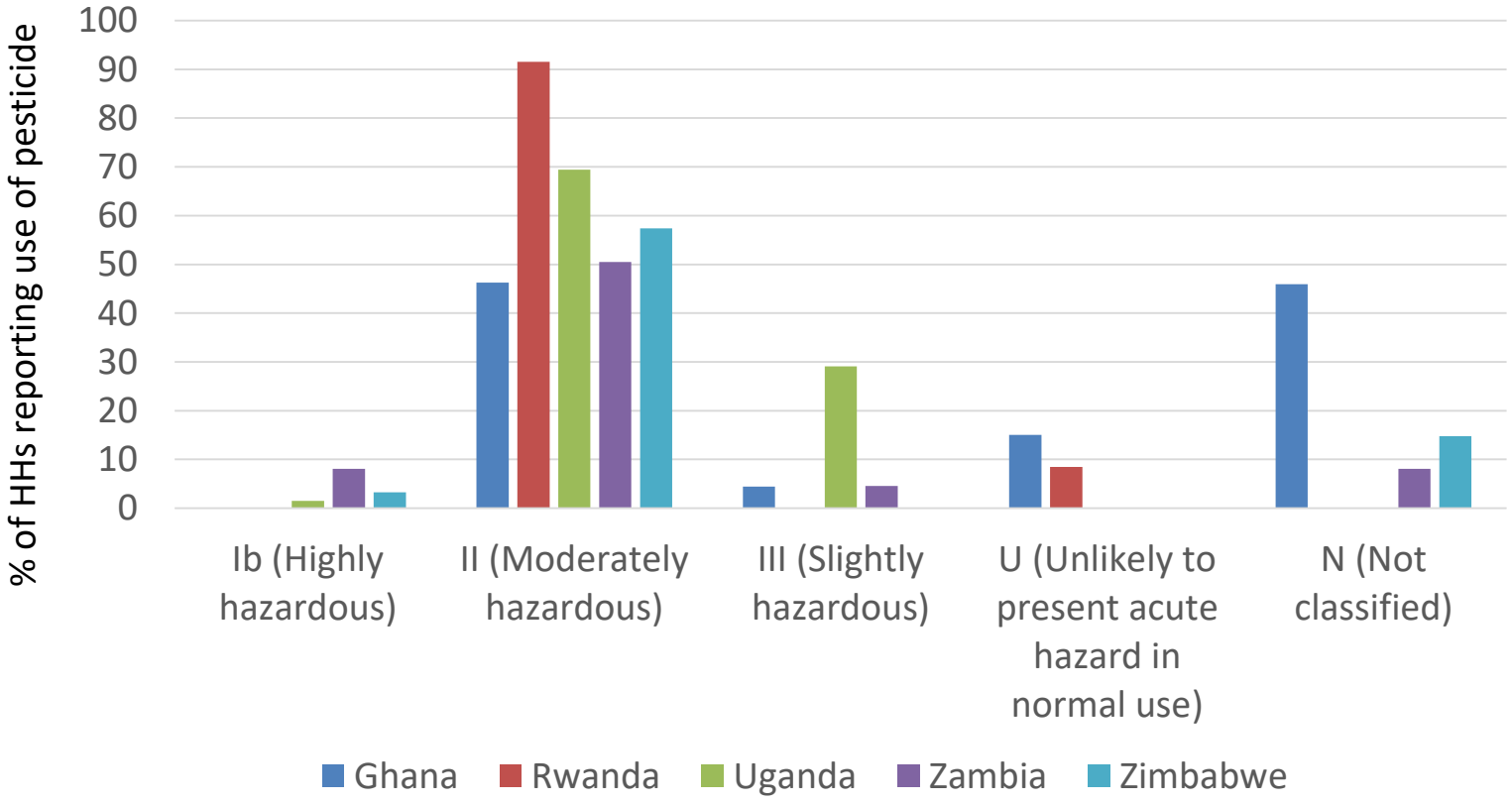
Challenges: Highly Hazardous pesticides



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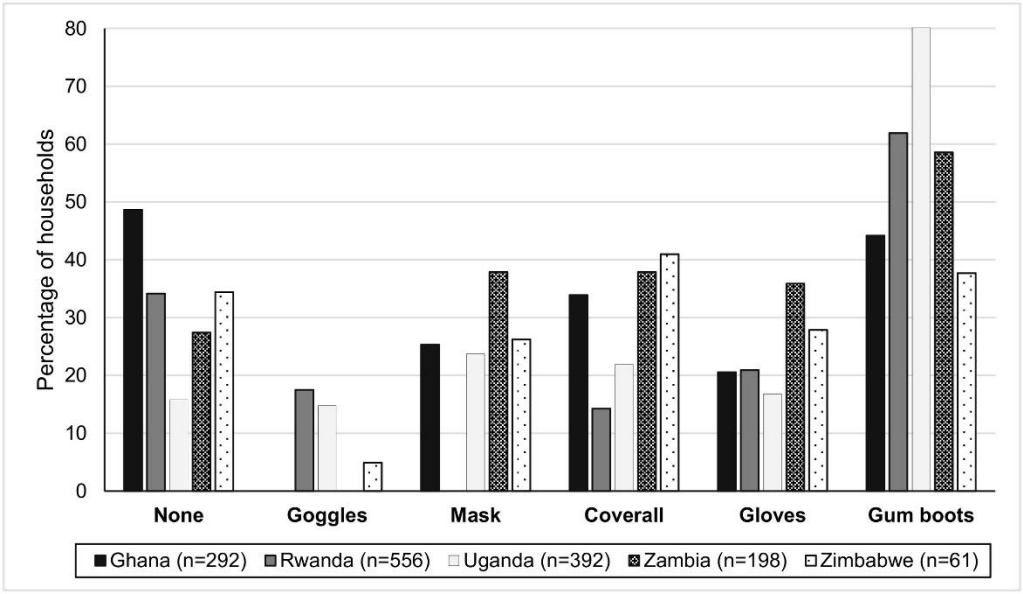
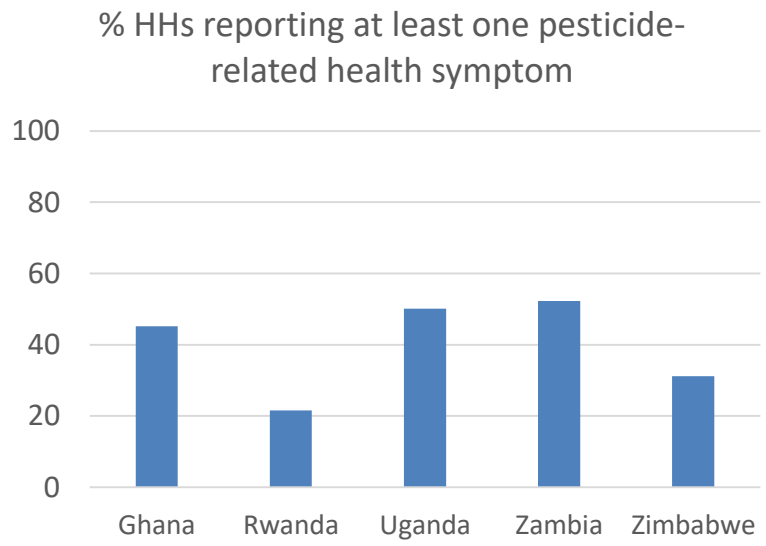
Challenges:
Relatively weak risk reduction practices





Tambo et al. 2020

Biological control as a key component in FAW management

- Over 30 parasitoid and predator species in Africa and Asia.
- Mass rearing and mass releases are being tested.
- Over 15 biopesticide options for FAW – Bt, *Beauveria bassiana*, *Metarhizium anisopliae*, SfMNPV, neem-based products showed promise.

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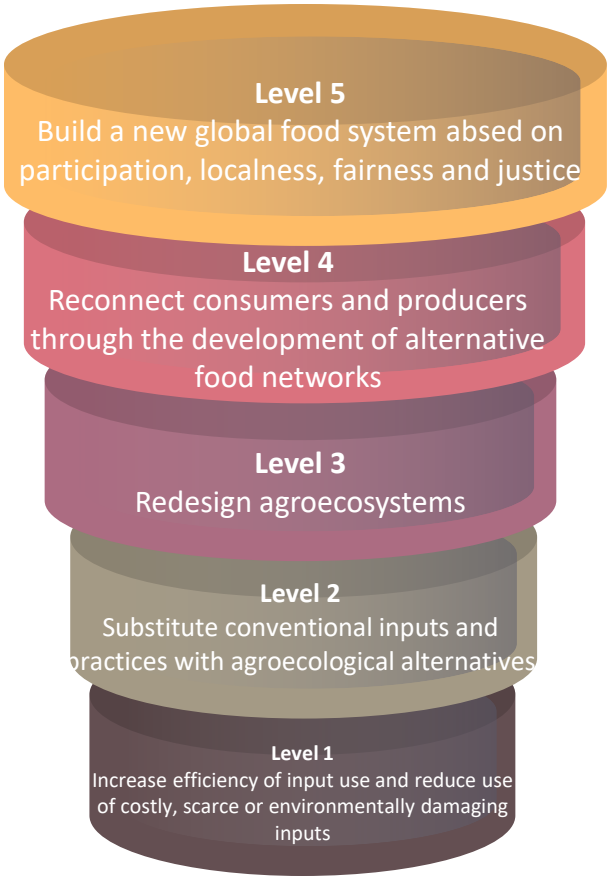
Agroecology elements and transition levels



Approved by FAO Member States (Dec. 2019)

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Examples at scale: India – AP Community Managed Natural Farming (AP CNF)

Agroecology offers *culturally appropriate, low cost* options to manage pests by promoting *plant health* and enhancing *pest control services* of natural enemies.

1.Integrated soil health & moisture mgmt.
- Microbial inoculants from local resources
- Mulching
- Aim: 365-day green cover on fields

2. Conserving natural enemies

3. Diversity at farm/landscape
- 5 layer cropping and other models

4. Botanical pesticides biopesticides; local controls

Low pest incidence on maize on AP CNF farms compared to conventional farms
+ multiple benefits

General challenges in mainstreaming biological control in FAW management

- Registration capacity for biopesticides
- Availability and accessibility of biopesticide options in local levels
  - Capacities for local producers and local logistical chain
- Farmers' capacity for proper use of biopesticide

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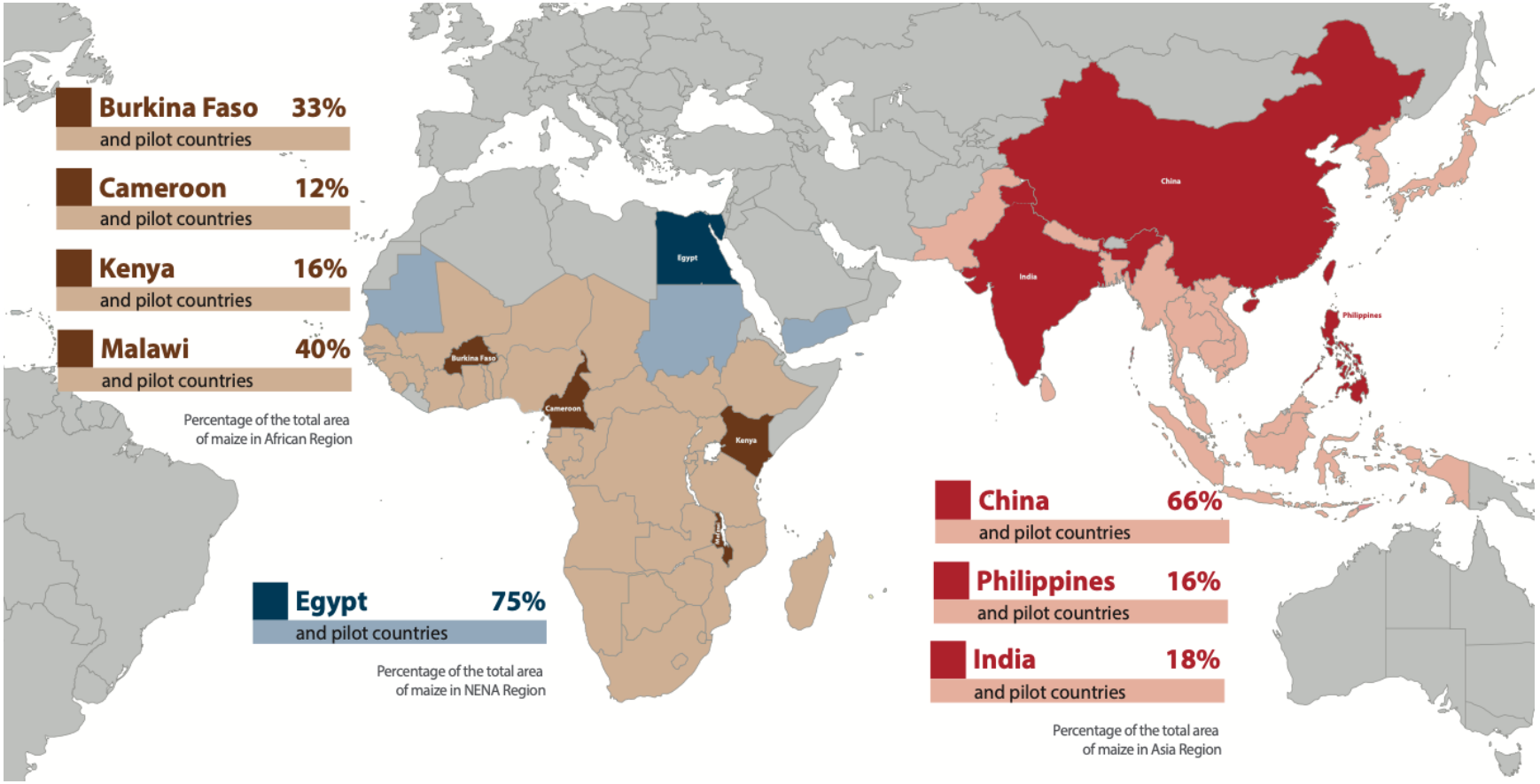
The way forward: **8** Demonstration and **53** Pilot countries



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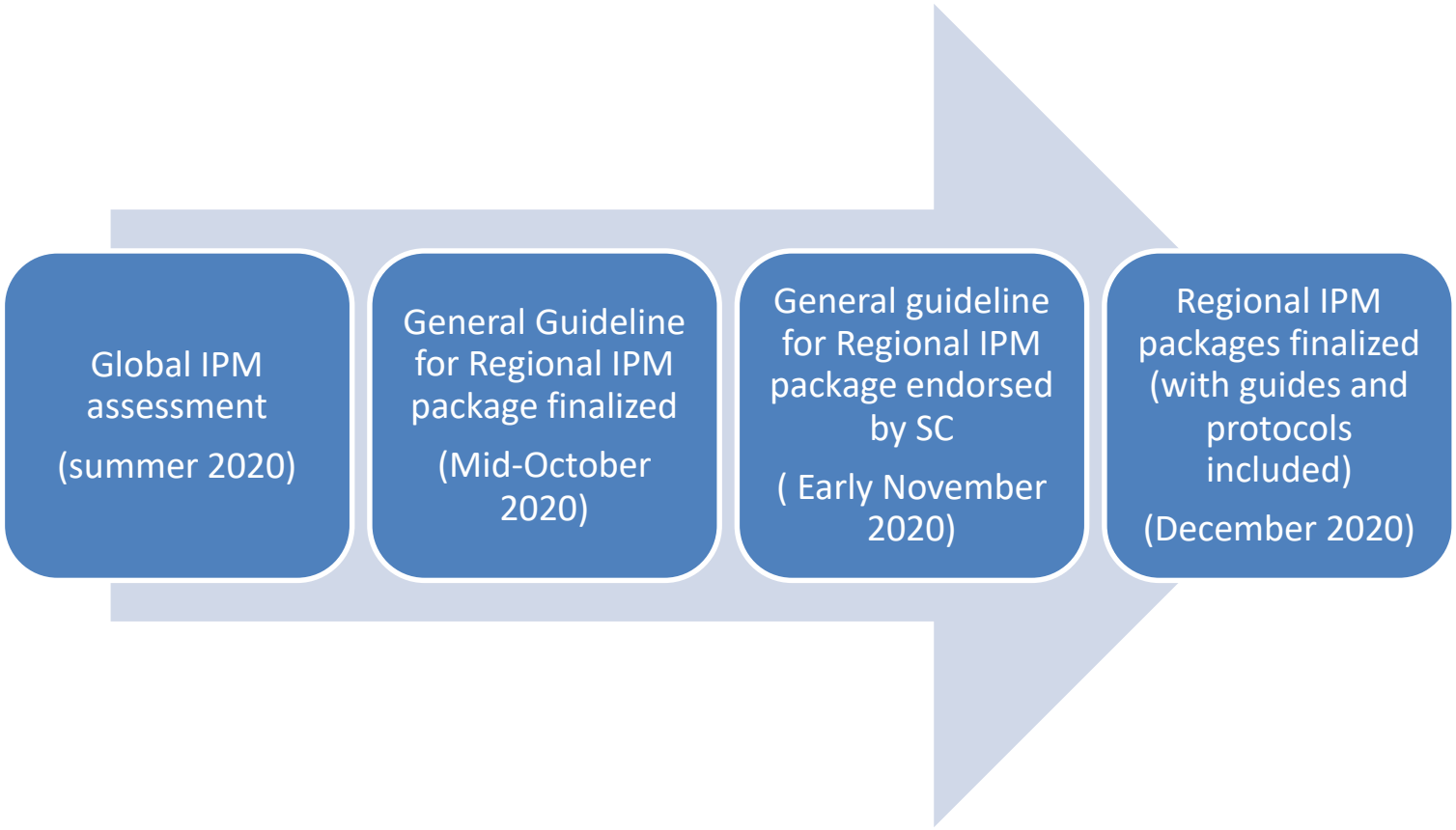
The way forward: Regional IPM packages



The way forward: Mainstreaming biological control in FAW management

- Support in **registration capacities** for biopesticides
- Support in **demonstrating biological control options** in focus countries (China, India, the Philippines, Egypt, Burkina Faso, Kenya, Cameroon, Malawi)
- Support in **capacity enhancement**, both for local producers, logistical chain and farmers' capacity for biological control options

Thank you

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