



Food and Agriculture
Organization of the
United Nations



Global Action for Fall Armyworm Control: Challenges and the way forward

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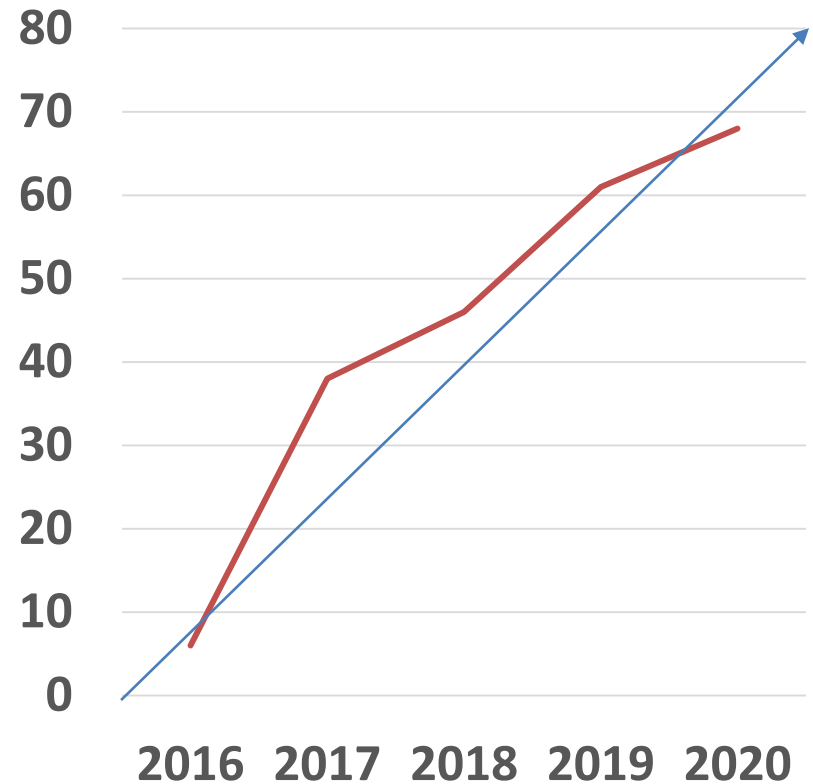
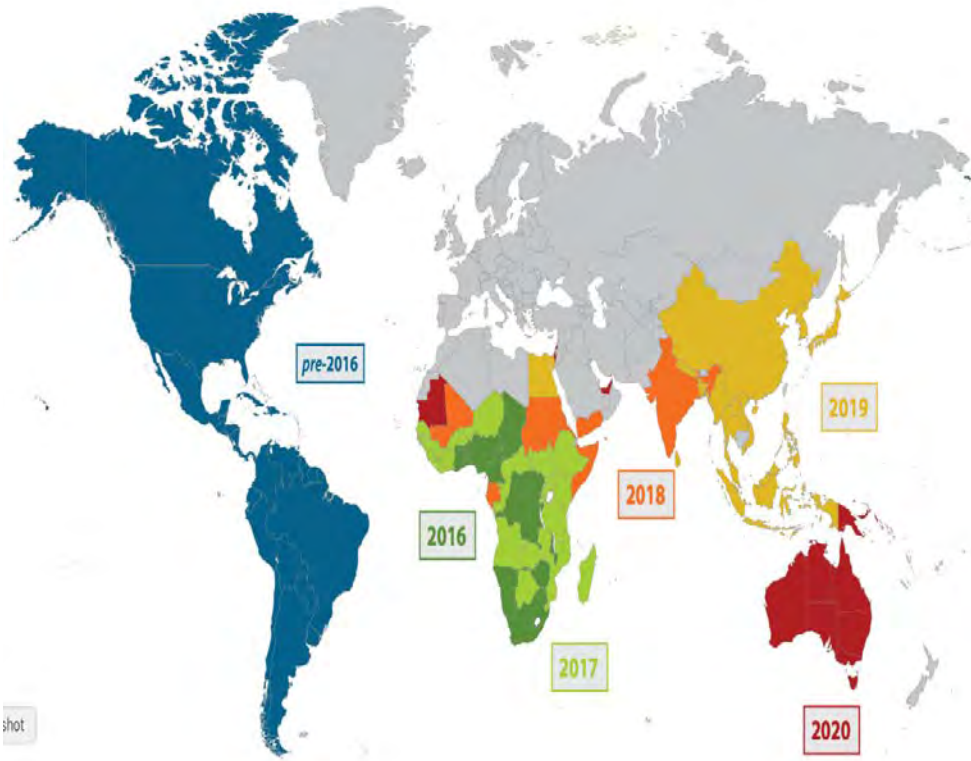
Background: Fall armyworm

- ***Origin from Latin America:*** A major noctuid pest with *three key characters:*
 - ***High reproductivity:*** >1,000 eggs / female moth
 - ***Broad host range:*** Over 80 crops
 - ***Long distance migration:*** Over 500 km





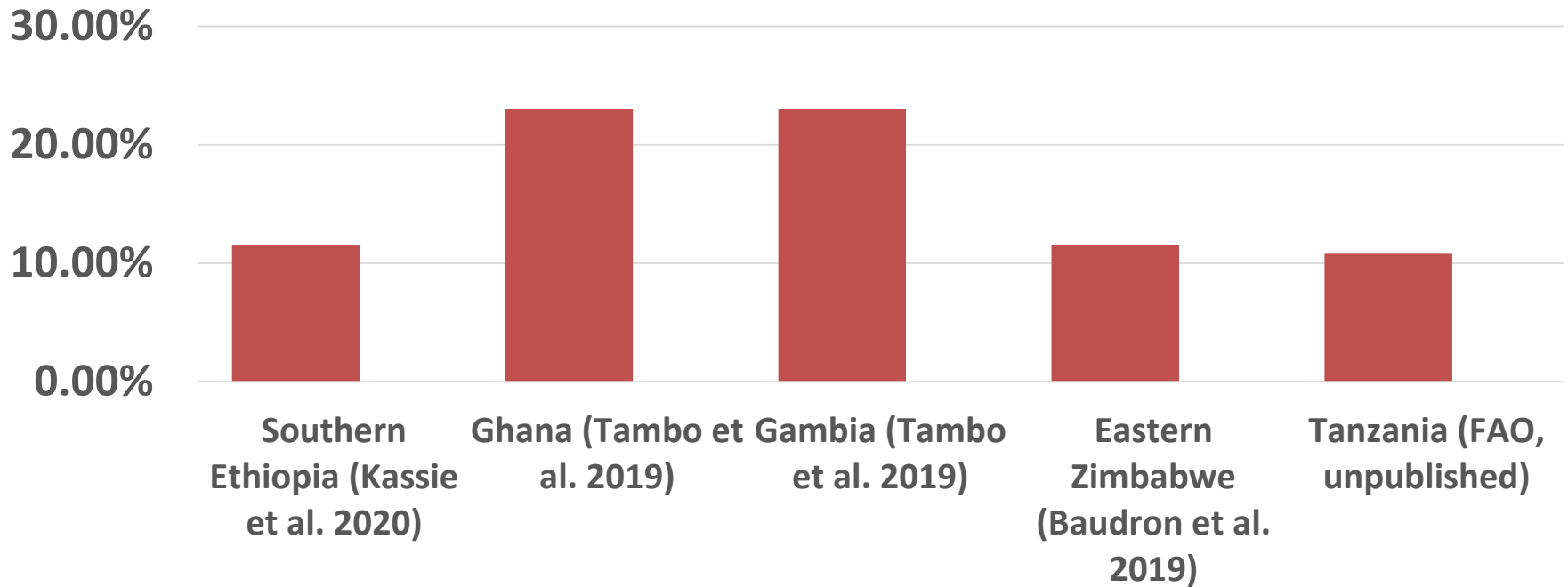
Background: Global Invasion





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





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 by the Chief Scientist of USAID; 7 TGs with 50 members; three meetings – Global IPM assessment in summer 2020





Objective: Reduction of crop losses

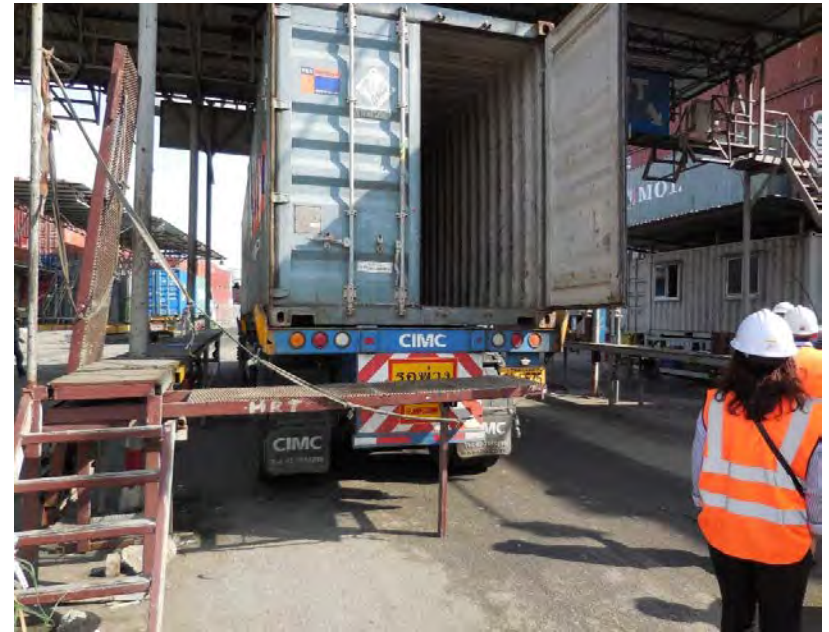
- **Target:** Crop yield losses to be reduced by 5% in all demonstration countries and 10% pilot countries
- **Strategy:** Region-specific IPM package
- **Regions:** Africa, Asia and Near East





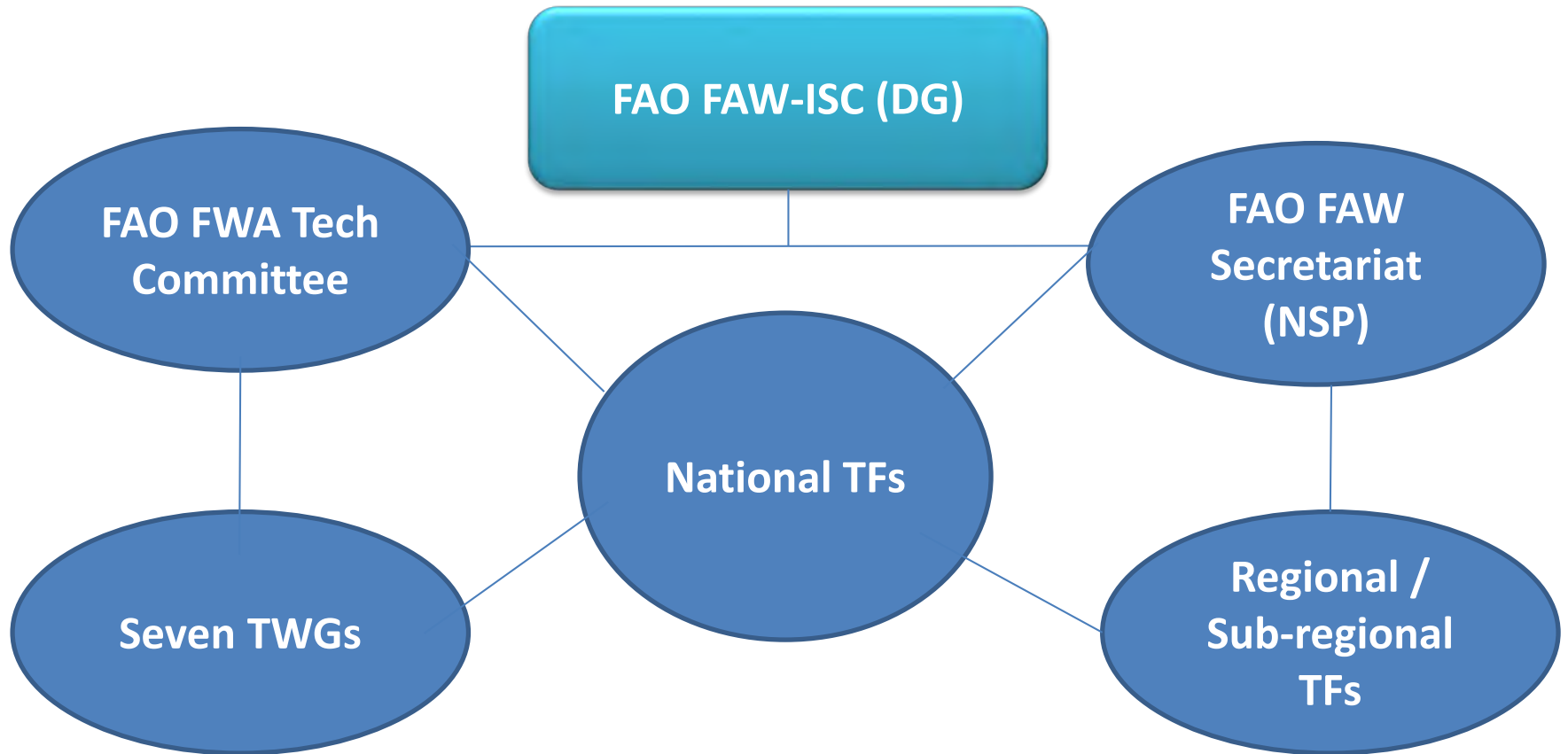
Objective: Delay of further spread

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





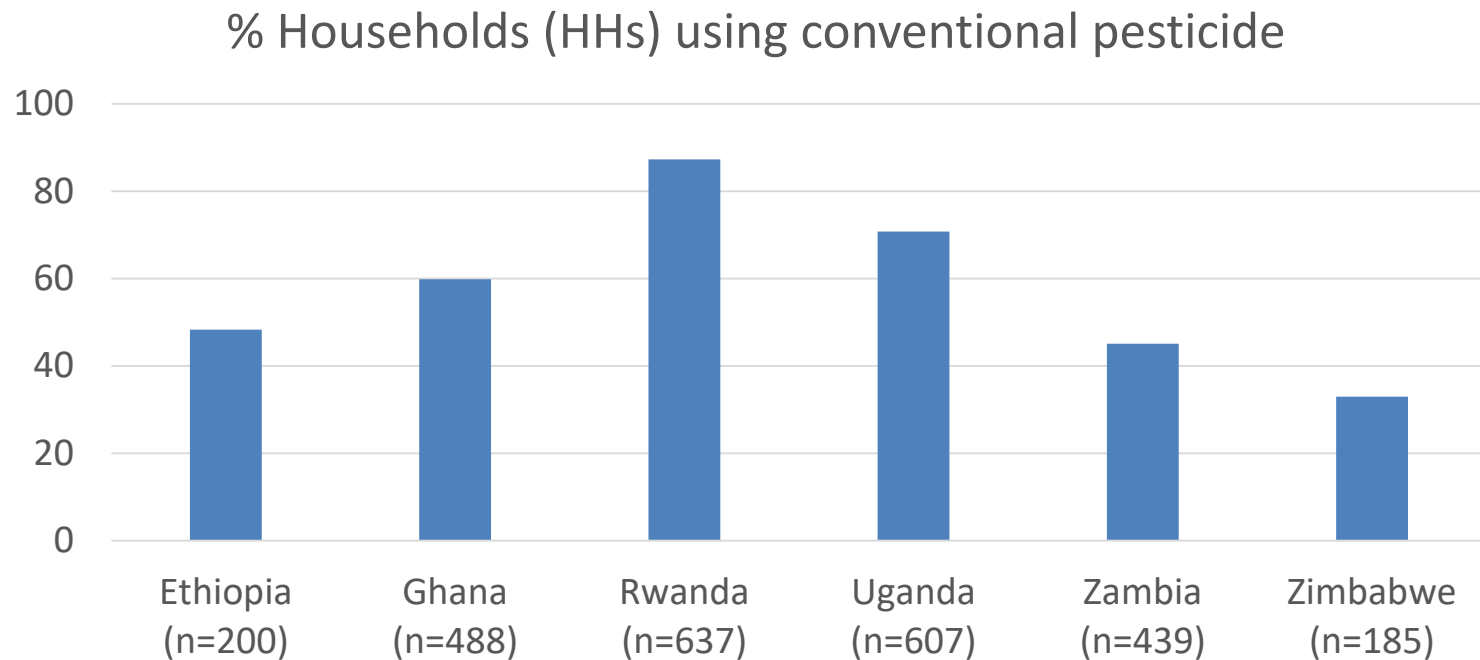
Objective: Global Coordination





Challenges:

Conventional pesticides as the predominant management techniques

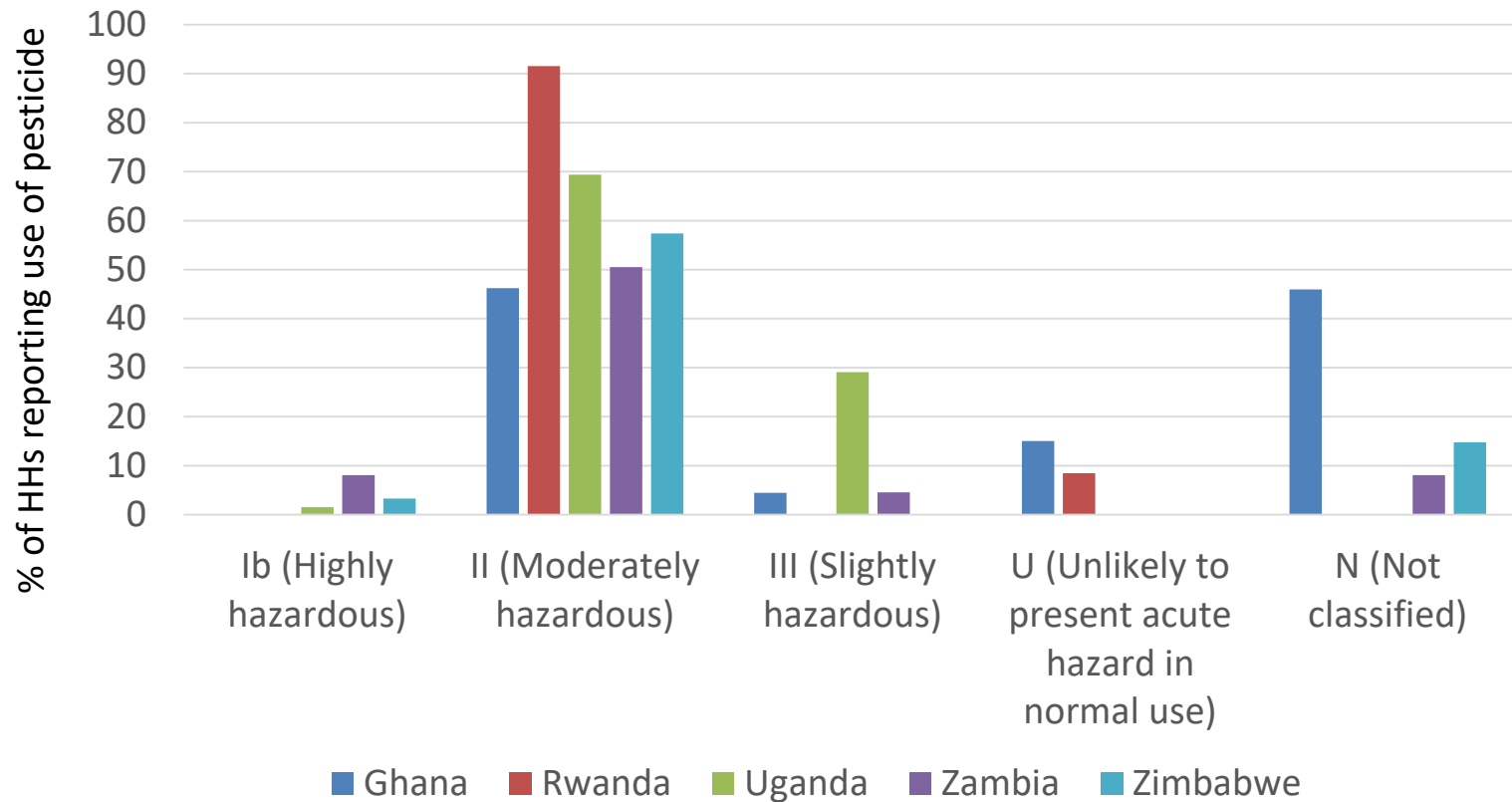


Kumela et al. 2018

Tambo et al. 2020



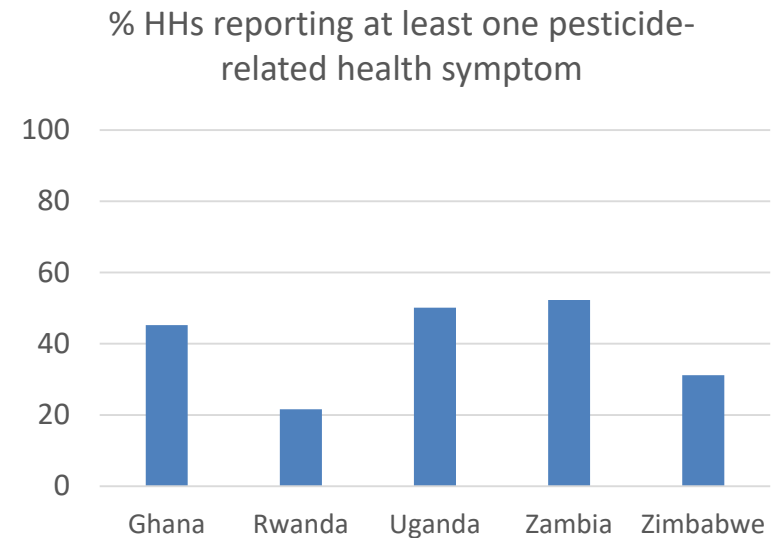
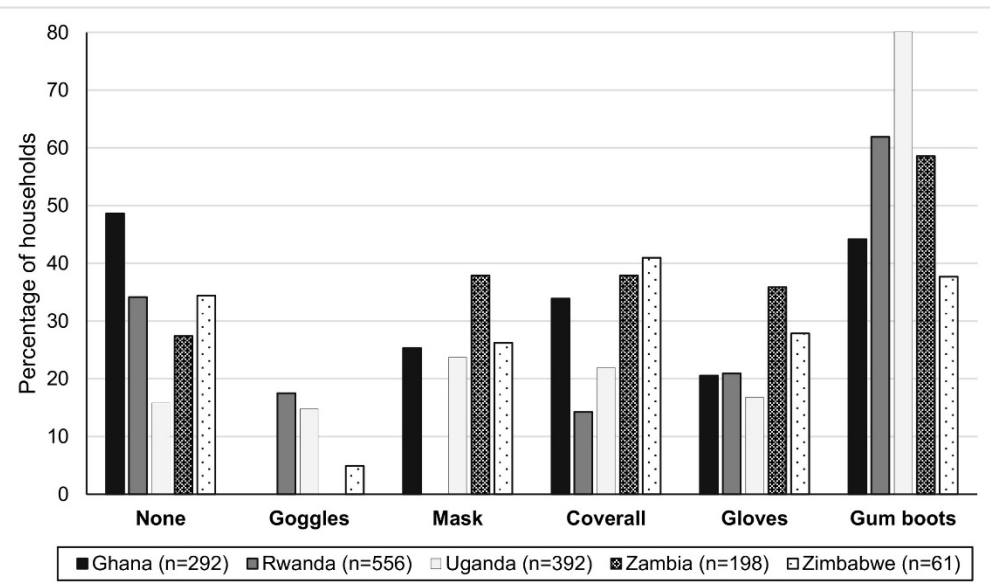
Challenges: Highly Hazardous pesticides



Tambo et al. 2020



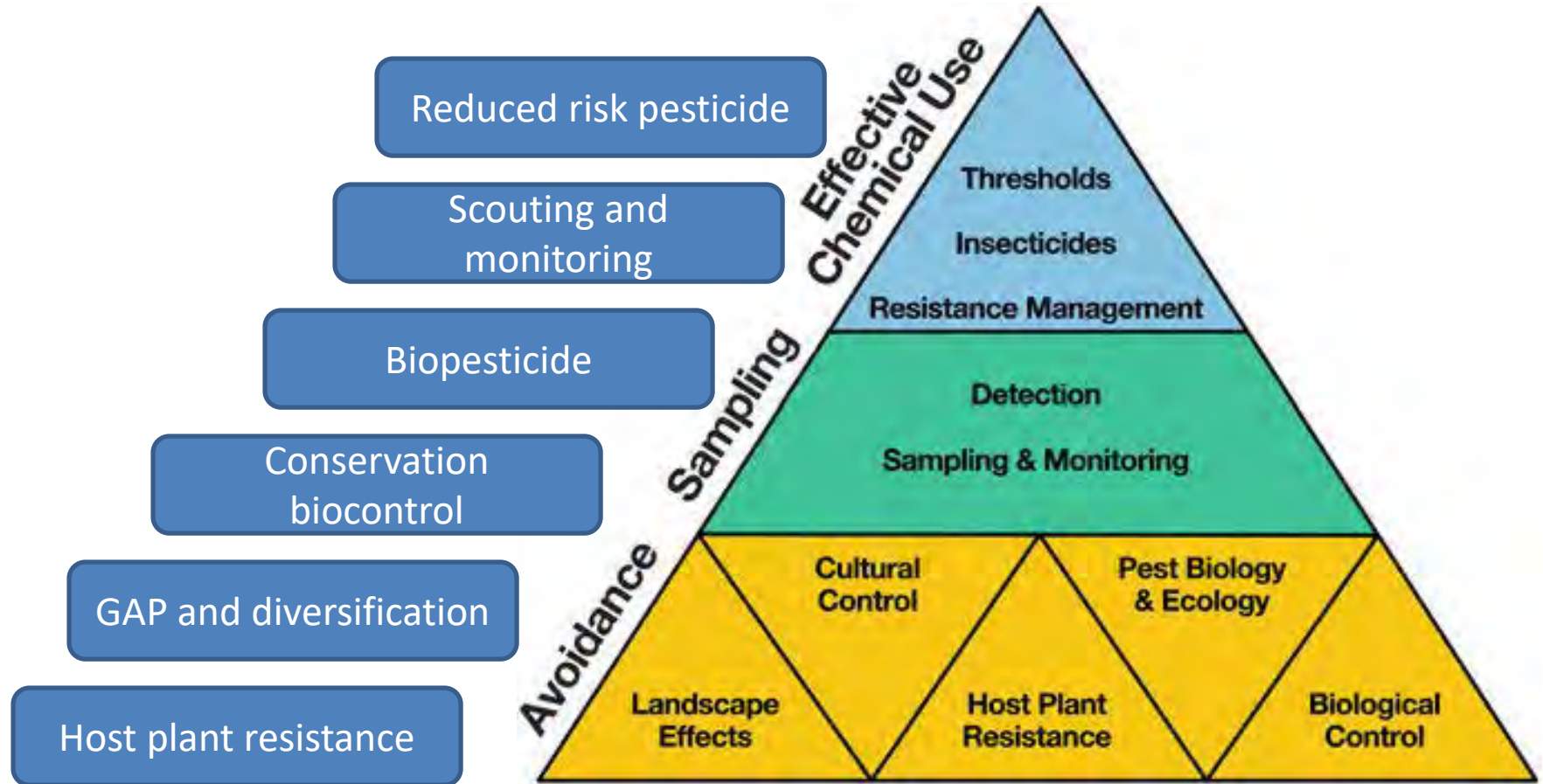
Challenges: Relatively weak risk reduction practices



Tambo et al. 2020



Solution: FAW IPM



IPM Pyramid (Naranjo 2011)



Monitoring: FAMEWS



Thu, 17 October

Temperature : 18.9 °C Humidity : 67.8 %
 Rainfall : 0.0 mm WindSpeed : 1.8 Km/h

Expected Rainfall

Oct 18	Oct 19	Oct 20	Oct 21	Oct 22
0.0	0.0	0.0	0.0	0.0

Start Survey Nearby Users

Trap Manager **My Farms**

Date	Status
2020-10-19T07:45:57.000Z	pending
2020-10-19T08:01:49.000Z	pending
2020-10-19T08:14:49.000Z	pending
2020-10-19T08:29:02.000Z	pending
2020-10-19T08:29:40.000Z	pending
2020-10-19T08:09:36.000Z	pending
2020-10-19T07:56:27.000Z	pending
2020-10-16T15:21:30.000Z	pending
2020-10-16T16:06:46.000Z	pending
2020-10-16T16:24:25.000Z	pending

Buttons: Delete selected, Accept selected, Reject selected

Map showing survey locations across Africa, the Middle East, and Asia.

Since the beginning of 2020, FAMEWS received **7210** Scouting records, that mean **more than 360 000 maize plants** were checked across Africa, Near East, and Asia.



GAP and conservation biocontrol

Interventions	Effectiveness	Scalability	Strength of scientific evidences
Balanced fertilization using both organic and inorganic fertilizer	Moderate to high	High	High
Minimum tillage	Moderate to high	Moderate to high	High
Mulching	Moderate to high	Moderate to high	Moderate to high
Intercropping	Moderate to high	Low to high (Region dpdt)	High
Field margins for conservation biocontrol	High	Low to high (Region dpdt)	High
Food amendment for conservation biocontrol	Low to moderate	Low to moderate	Low
Mechanical control	Low to moderate	Low	Low



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, SfMNPV, neem-based products showed promise.



Minimum pesticide list for FAW control (Jepson et al. 2020)

	Efficacy unknown	<80% control	80-100% control
Highly hazardous pesticides	Phorate, monocrotophos, ...	Carbofuran, carbosulfan, ...	Beta-cyfluthrin, methomyl, ...
High risk pesticides to health and environment requiring max PPE	Cartap hydrochloride	Abamectin, chlorpyrifos, ...	Gamma cyhalothrin, lambda cyhalothrin, ...
...			
Lower risk pesticides req single layer PPE, high env risk	--	--	Lufenuron, novaluron, spinetoram, spinosad, ...
Lower risk pest for health and env	Pyriproxifen	<i>Bt serovar kurstaki</i> , <i>B. bassiana</i> , <i>M. anisopliae</i>	<i>A. indica</i> , <i>Bt. serovar aizawai</i> , SfNPV, pyrethrum, chlorantraniliprole, methoxyfenozide

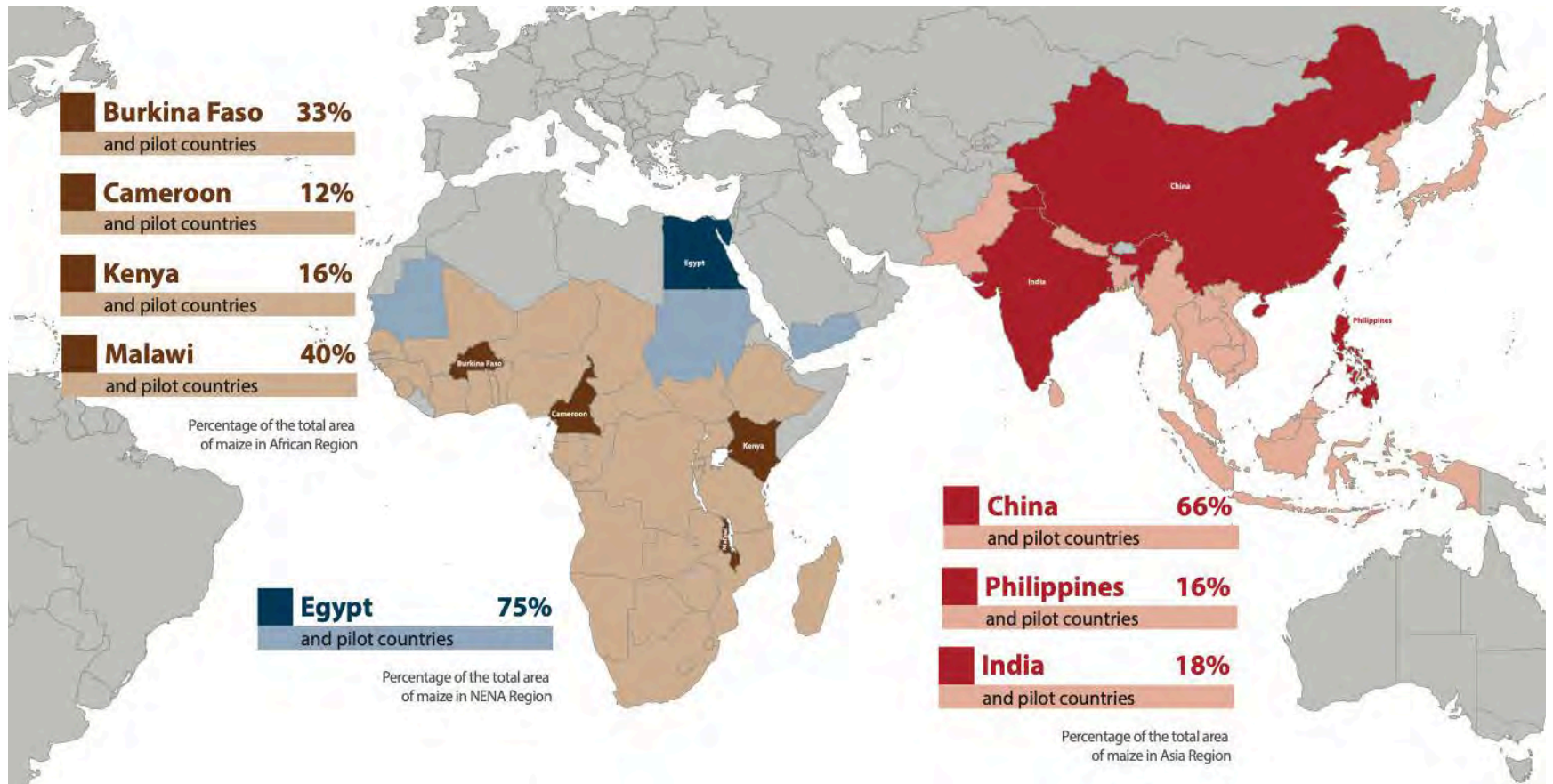


IPM's Achilles' heels

- Economic thresholds
 - ET is highly dependent on variety, plant and environmental health in general (e.g. co-stressors, levels of natural enemies)
 - ET is also highly dependent on local farm gate prices and costs of intervention
 - As such, ET should be highly localized (or at least calculated at regional/ national levels). These information are not always readily available, yet all pesticide application should be guided by it
- Insecticide resistance management
 - Genetic mutation for organophosphate resistance from FAW populations collected in Asia and Africa (Guan et al. 2020)
 - Lab diagnosis showing development of resistance against some pyrethroids and organophosphate from FAW populations collected in Asia (Zhang et al. 2020)

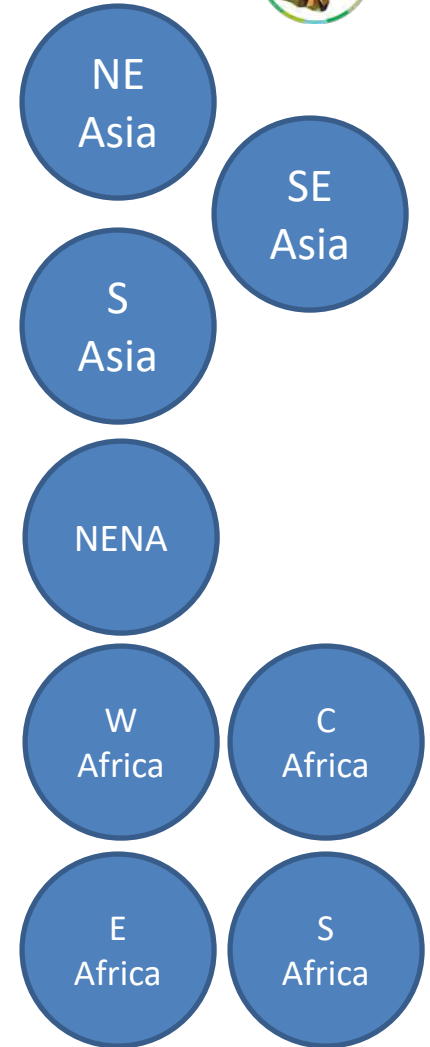
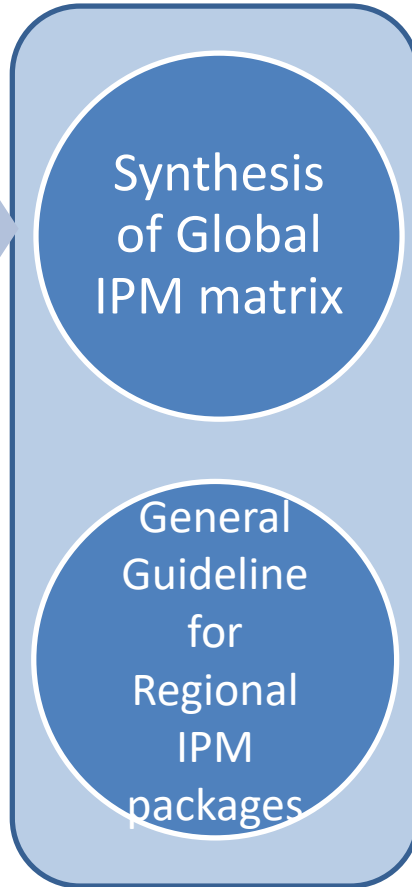


The way forward: 8 Demonstration and 53 Pilot countries





Way forward: Process

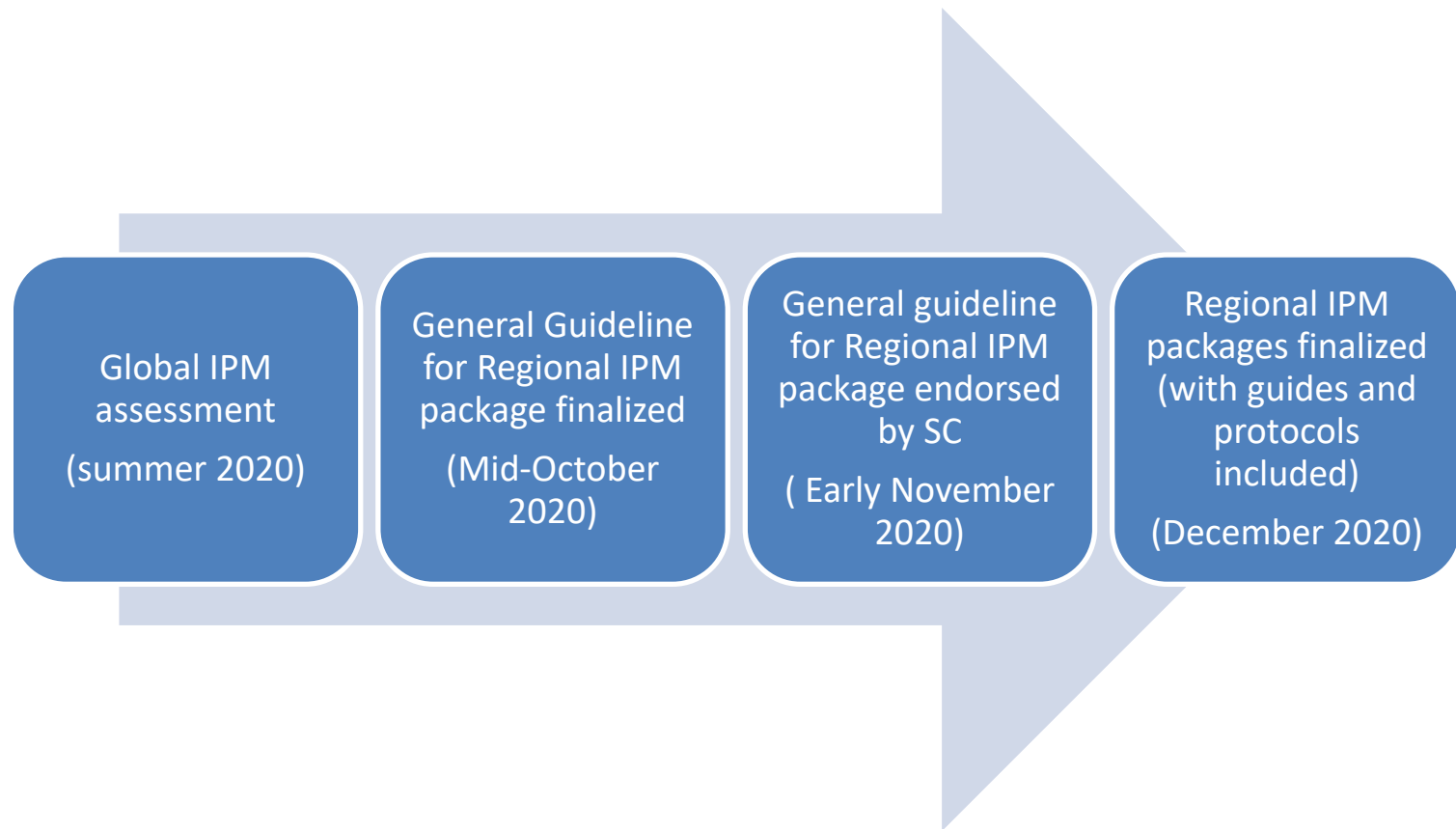


TC, TWG, FAO FAW Sec

Regional Tech teams



Timeline





Thank you

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