



Food and Agriculture  
Organization of the  
United Nations

# REGIONAL WORKSHOP FOR ASIA SUSTAINABLE MANAGEMENT OF FALL ARMYWORM

Kunming City, Yunnan Province, China, 11 – 15 November 2019





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## 1. BACKGROUND

Fall Armyworm (FAW) was first detected in Central and Western Africa in early 2016 and has quickly spread across virtually all of sub-Saharan Africa. In July 2018, it was confirmed in India and Yemen and by December 2018, it had been reported in Bangladesh, Sri Lanka and Thailand. As of June 2019, it has been reported in Myanmar, China, Indonesia, Laos, Malaysia and Vietnam, and the Republic of Korea. Japan reported the presence of FAW in July 2019.

Critical questions quickly followed: How can farmers manage FAW when it is in their fields without spending a lot of money and harming their health and the environment? What can be done to reduce yield losses and to forecast where this insect will spread? How can Asian countries work together to manage this pest, which brings an additional challenge for agricultural producers already faced with plant diseases, degrading soil, climate change and many other constraints.

To discuss these questions, and building on **Consultative Meeting on Fall Armyworm in Asia** held in Bangkok from 20 to 22 March 2019, the Food and Agriculture Organization of the United Nation (FAO) co-organized a Regional Workshop on Sustainable Management of Fall Armyworm in Asia, working together with the Chinese Ministry of Agriculture and Rural Affairs (MARA). This event was held from 11 to 15 November 2019 in Kunming City, Yunnan Province, China.

Eleven Asian countries participated and shared information on the implementation status of country work plans as well as deciding to increase collaboration and information exchange. The programme for the workshop is available in **Annex 1**.

## 2. PARTICIPATING COUNTRIES

Bangladesh, Cambodia, China, Indonesia, Japan, Myanmar, the Lao People's Democratic Republic, the Republic of Korea, Sri Lanka, Thailand and Viet Nam participated in the workshop (**Annex 2**).

## 3. OUTCOMES

All countries shared the status of their sustainable FAW management, and progress on implementation of their country work plans since the March 2019 **workshop in Bangkok**.

Key challenges and gaps were analyzed and future priorities identified in terms of FAW management. Many countries highlighted the need for sharing research knowledge. Monitoring and early warning capacities in many countries and knowledge of integrated pest management (IPM) solutions for FAW management should also be enhanced. As many governments distribute pesticides free of charge as a first reaction to FAW, there is still **great reliance on the use of pesticides**. All countries agreed that lessons learnt should be shared throughout the region.

Several new, innovative technologies and products for monitoring and sustainable managing FAW were showcased during a field visit that was part of the workshop. They included the use of pheromone lures and traps, mating disruption, use of biocontrol and biopesticides, mass trapping tools, high altitude and radar trapping monitoring systems, and automatic monitoring systems.

To improve regional collaboration on FAW monitoring and early warning, and sustainable management of the pest, a proposal on voluntary joint actions were

agreed upon by all 11 participating countries (**Annex 3**). In addition, a **working group** was set up under the Asia-Pacific Plant Protection Commission (APPPC) to coordinate the joint actions, which include:

- FAW monitoring in the region, mainly based on FAO's FAW Monitoring and Early Warning System (FAMEWS);
- exchange of monitoring data and sustainable FAW management experiences;
- promotion of sustainable FAW management in Asia, including promotion of IPM and biocontrol to reduce reliance on pesticides;
- strengthening policy and financial support.

In addition, a representative from FAO's Business Development and Resource Mobilization Division presented information on possible funding mechanisms for a global FAW programme. Scaling up the support provided to farmers and governments is a high priority for FAO. It was proposed these two entities work together to mobilize resources for regional joint actions on FAW. Furthermore, China is committed to providing FAW monitoring equipment and products for testing and adaptation to countries requesting this, to strengthen their capacities and ultimately contribute to a coherent and successful FAW management approach in Asia.

## 4. SUMMARY OF COUNTRY PRESENTATIONS

### BANGLADESH

#### FAW infestation status

Maize (FAW's preferred crop) is mostly used for poultry, dairy and fish feed. FAW was detected in eight regions (out of 14), 22 districts (out of 64) and 71 administrative regions (*upazillas*). Infestation ranges differed from 0.5 to 32.0 percent.

#### What is the country doing to control FAW?

- Bangladesh began monitoring FAW in May 2018 using pheromone traps.
- Chemical pesticides were applied to manage FAW in the fields (Lambda-cyhalothrin, Chloripyrifos, Emamectin Benzoate, Chlorantranitiprole and Thiamethoxam sprayed at two-week intervals), but FAW is still present.

- Development of integrated management package (in collaboration with CABI):
  - > hand-picking of larvae two-three times per week;
  - > mass trapping in pheromone traps and water traps;
  - > application of microbial pesticide *Spodoptera Neucleopolyhydrosis Virus* (SNPV);
  - > mass rearing of egg parasitoids (*Trichogramma* spp.).

#### What is the way forward to better manage FAW?

- information exchange throughout the Asia region on FAW distribution and movement;
- reach more farmers;
- inform extension officers.

Pheromone traps were distributed to monitor the presence of FAW



© Bangladesh Agricultural Research Institute/Debasish Sarker

### CAMBODIA

#### FAW infestation status

Four provinces are infested by FAW, with a total of 11 142 ha.

#### What is the country doing to control FAW?

- A FAW training workshop for extensionists, agricultural schools personnel and Farmer Field School (FFS) trainers was held from 3 to 4 July 2019. Information material for FAW identification and management was developed in collaboration with International Rice Research Institute (IRRI).
- IRRI training for technical staff in the Cambodian Department of Plant Protection Sanitary and Phytosanitary for FAW identification was held from 21 to 25 October 2019.
- Cambodia participated in the **Training Workshop on Biological Control of Fall Armyworm** in Niger from 20 to 28 July 2019, organized by FAO and

conducted by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

- During the ICRISAT training participants learned how to differentiate between males and females of different parasitoid species and about various steps in rearing them. Training also involved scouting FAW eggs to assess parasitism and collecting egg parasitoids to start a culture. Last, participants learned how to release the parasitoid once a culture is established.

#### What is the way forward to better manage FAW?

- translate from English into Khmer language the FAW animation video "How to Identify and Scout for Fall Armyworm" produced by Scientific Animations without Borders (SAWBO);
- conduct FFS that focus on IPM management of FAW;

- place more traps and lures to estimate the population of FAW;
- implement FAW Monitoring and Early Warning System (FAMEWS);
- survey and monitor FAW parasitoids such as *Trichogramma* sp., *Telenomus* sp., *Cotesia* sp.;
- Cambodia's NNPO will create an animation video to use for FAW awareness; video will be translated into Khmer language and posted on TV and on social media for educational purposes.

## CHINA

### FAW infestation status

#### Occurrence area of different crops

作物 Crops	发生面积 (公顷) Occurrence area/ha	占比 (%) Percentage/ %
玉米 Corn	1104347.00	98.61
甘蔗 Sugarcane	12238.13	1.09
高粱 Sorghum	2745.77	0.25
小麦 Wheat	333.53	0.03
薏苡 Job's tears	135.00	0.01
莪术 Zedoary	69.07	0.01
香蕉 Banana	30.67	0.00
花生 Peanut	20.33	0.00
马铃薯 Potato	5.33	0.00
油菜 Rape	3.33	0.00
合计 Sum	111992.17	100.00

#### China migration



© MARA, Department of Crop Production, P.R.C./Zhu Enlin

#### What is the country doing to control FAW?

In May and June 2019, two national video conferences for controlling Fall Armyworm were held to assign responsibilities from central administration to provincial, municipal, county and village governments. Following support was provided to farmers:

- policy support;
- monitoring networks set up (pheromone, light and radar traps) with trainings;
- IPM training (including printing and distribution of 15 500 000 technical posters);
- emergent control;
- research support;
- financial support;
- public advocacy;
- media reporting;
- published list of recommended pesticides.

#### What is the way forward to better manage FAW?

- monitoring and prevention;
- further strengthening farmers' capacities;
- close collaboration with other Asian countries (e.g. sharing monitoring and management experiences).

## INDONESIA

### FAW infestation status

- FAW in Indonesia has spread widely to 25 out of 34 provinces and across 9 954 hectares. As maize is the second-most important staple food

of Indonesia and mostly produced by smallholder farmers, FAW poses a serious threat to food security and the livelihoods of millions of people.

### FAW distribution in Indonesia as of October 2019



© Ministry of Agriculture, Republic of Indonesia/Fakhri Zakaria

### What is the country doing to control FAW?

Farmers and extension workers are actively involved in massive efforts to control FAW, and the control measures have effectively reduced FAW infestation in the field and yield losses. The measures taken are:

- FAW workshop in Lampung, 31 July – 2 August 2019;
- training on FAW Biological Control, 19 – 21 September 2019;
- FAW workshop in Yogyakarta, 19 – 20 September 2019;
- set up of national FAW task force consisting of government officials, universities, stakeholders
- daily online updates;
- capacity development for extension workers, laboratory staff, local government officers, and farmers.

### Control measures:

- mechanical and physical control (use of lime and ash);
- biological control (*Metarhizium* and *Beauveria Bassiana*);
- botanical pesticides (*Aegle marmelos*);
- chemical control.

### What is the way forward to better manage FAW?

- conduct more research on biological control based on IPM;
- conduct and evaluate pilot projects on FAW management;
- capacity building for extension officer;
- FAW field monitoring;
- FAW massive control by community;
- FAW - IPM Field School.

## JAPAN

### FAW infestation status

FAW was first detected in fields in Kagoshima Prefecture, according to Japan's agriculture ministry. As of October 2019, the pest had spread to 20 prefectures. It was also found on sugarcane and sorghum.

### What is the country doing to control FAW?

Japan's Ministry of Agriculture published a list of effective pesticides and launched subsidies to support their purchase and other costs.

### What is the way forward to better manage FAW?

Information exchange with neighboring countries and monitoring and early warning systems are needed.

### The FAW invasion hit Japan unexpectedly



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## THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

### FAW infestation status

Maize is the second main crop after rice, and is produced in only one cycle per year. As of July 2019, FAW had spread to 432 villages in 57 districts. FAW was found in all maize fields. In total 39 646 ha were damaged by FAW.

### What is the country doing to control FAW?

In the Lao People's Democratic Republic, FAW was mainly controlled using pesticides (Emamectin Benzoate). The country has no monitoring system in place and farmers do not know much about the pest.

The government of the Lao People's Democratic Republic produced a series of information posters and provided technical trainings to extensionists.



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**What is the way forward to better manage FAW?**

The Lao People’s Democratic Republic has identified priorities and plans for the way forward:

- active surveillance/ monitoring;
- apply new experience (use of biocontrol agents);
- technical training to farmers and FFS;
- provide biopesticides;
- set up a monitoring and early warning System;
- needed: enhanced information exchange among neighboring countries and technical assistance.

**MYANMAR**

**FAW infestation status**

**Myanmar Infestation area**



© Department of Agriculture, Myanmar/Thain Win

In Myanmar 56 700 ha of land are cultivated with maize. In October 2018, Myanmar was notified through the APPPC that FAW might reach the country, migrating from India. Since then, different staff from the State and regional Plant Protection Division (PPD) have been conducting surveys for FAW on various crops in their regions. FAW was confirmed in Myanmar

for the first time in late 2018 in maize fields in the Ayeyarwady region, where it destroyed the winter maize. It spread to nine states/regions within a short period of the same year and as of January 2019 it had invaded 16 200 ha.

**What is the country doing to control FAW?**

The Ministry of Agriculture, Livestock and Irrigation (MoALI) launched the website “Early warning for FAW incidence” ([www.ppdmyanmar.org](http://www.ppdmyanmar.org)). In addition, it asked FAO Myanmar to provide emergency technical

assistance to determine the level of infestation, map the extent of infestation in Myanmar and recommend management actions, including:

- pesticides application with drones;
- farmer education on control measures for FAW infestation (through FFS, social media, PPD websites, Facebook, radio, TV);
- distribution of posters on FAW lifecycle and control options (recommended: mechanical control, traps, chemical insecticides, organic pesticides such as neem, biological control, intercropping);
- published list of recommended pesticides (both chemical and biological);
- provision of *Trichogramma* cards to farmers (3 220 in total).

**What is the way forward to better manage FAW?**

- further outreach to farmers to help them prevent and manage infestations;
- chemical pesticides used only a last resort;
- further enhance monitoring and early warning system and greater cooperation with neighboring countries.

**THE REPUBLIC OF KOREA**

**FAW infestation status**

Some 15 472 ha are cultivated with maize in the Republic of Korea, providing for about 78 000 tons of maize for food and animal feed. FAW was found to be present in various locations in the Republic of Korea. Fortunately, the damaged plants were able to recover and total losses remained below one percent.

**What is the country doing to control FAW?**

Thanks to early detection and control measures taken, FAW did not cause damage to the maize fields. The migration occurred later than expected and FAW cannot overwinter in most regions of the Republic of Korea. However, it is anticipated that FAW will migrate into Korea to a greater extent, and earlier, and next time it may cause more severe damage to maize and other crops.

**Challenges and questions:**

- how to detect effectively and early enough;
- when to start control measures and what the economic threshold of those measures is;
- maximum government intervention level for risk management (e.g. financial support for chemical spray);
- whether it is necessary to identify other useful preventive methods.

**What is the way forward to better manage FAW?**

- surveillance: more monitoring sites (maize fields), start earlier;
- FAW monitoring data sharing with China, similar to the ongoing cooperation project of migratory rice pest forecasting between China (NATESC) and Korea (RDA);
- annual meeting, Hainan, China, 28 October – 1 November 2019;
- FAW IPM studies in Republic of Korea for identification, forecasting and control methods for next three years (2020 – 2022).

**THAILAND****FAW infestation status**

Some 5.2 million tons of maize produced in Thailand are used for animal feed (chicken, layer, swine and fish). Around 500 000 tons are used for human consumption and export. As of February 2019, 50 provinces throughout the country with maize-growing areas had been infested by FAW, five heavily.

Yield losses could reach 25–40 percent, causing an economic loss of USD 130–260 million.

**What is the country doing to control FAW?**

- various official meetings held;
- FAW information distributed (brochures, posters, press releases, telephone hotlines);
- research conducted on chemical control, biopesticides, biological control (such as natural enemies), cultural practices, seed treatment and pesticide application techniques.

**What is the way forward to better manage FAW?**

- train farmers on how to manage FAW in their fields and how to overcome the coincidence of drought and FAW;

**Infestation of FAW in Thailand**

- implement monitoring and early warning systems;
- increase public awareness;
- make biopesticides and biocontrol agents available;
- increase research on how best to manage FAW.

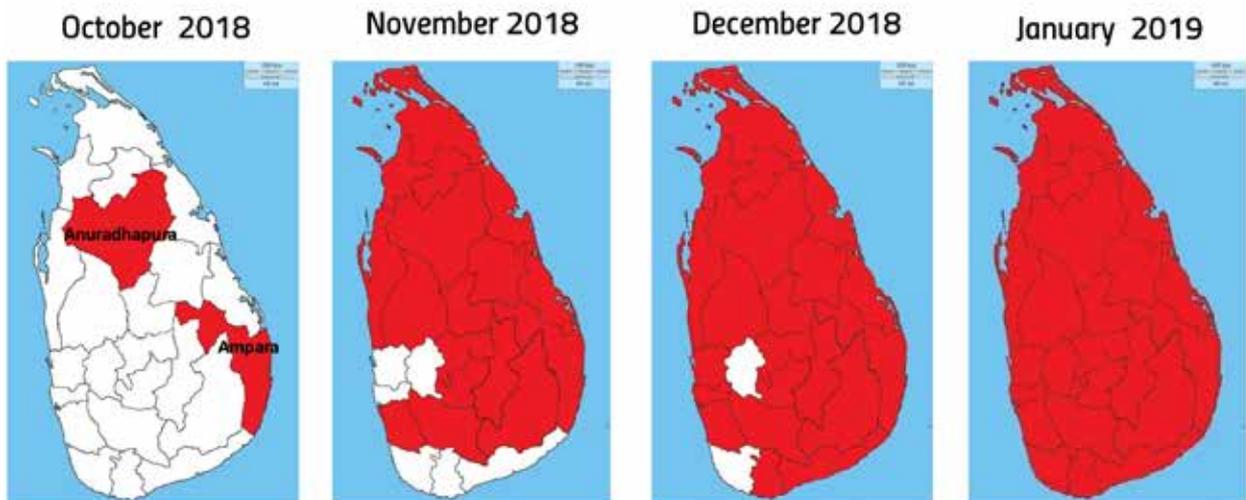
**Priorities:**

- encourage data- and knowledge-sharing across borders and regions;
- capacity building, awareness and education on local levels;
- FFS;
- international research collaboration for development of biopesticides;
- harmonize national registration processes for biopesticides and mild synthetic pesticides.

## SRI LANKA

### FAW infestation status

#### Spread of Fall Armyworm in Sri Lanka



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Maize is the second-most important cereal crop for the country and is mostly cultivated in the rain season. The estimated loss caused by FAW is between five percent and ten percent.

#### What is the country doing to control FAW?

Since FAW arrived in Sri Lanka at the end of 2018, the Department of Agriculture has recommended that farmers:

- avoid staggered planting/ late planting or off-season planting / planting new crop near infested fields;
- handpick and destroy eggs and small caterpillars;
- establish pheromone traps;
- use recommended fertilizers/avoid use of excessive amounts of nitrogen fertilizer;
- apply sand or ash into the whorl;
- apply neem seed kernel extract (300–500g/10 liters water);
- remove and destroy plant residues immediately after harvesting;

- plough the soil after harvesting to destroy pupae;
- use hybrid maize with FAW resistance.

The Department has also conducted research on maize varieties and their susceptibility to FAW, pheromone traps, seed treatments, various production methods such as intercropping, and biocontrol agents.

#### What is the way forward to better manage FAW?

- implement continuous awareness programmes on FAW management;
- conduct IPM FFS;
- strengthen pest monitoring and surveillance;
- continue further research activities on FAW management (mass production and field release of natural enemies/economic threshold levels/resistant breeding/population dynamics/ pheromone trap technology studies/ biopesticides/ pesticide residue studies);
- strengthen coordination and collaboration.

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## VIET NAM

### FAW infestation status

Viet Nam produces maize on a total of 221 000 ha of land, three seasons per year. In total, it is estimated that 46 000 ha are infested with FAW.

### What is the country doing to control FAW?

- resistant and genetically modified varieties planted;
- seed treatment;
- use of pheromone and sweet-sour bait traps;

- application of natural enemies;
- pesticides when there are young FAW larvae.

### What is the way forward to better manage FAW?

- strengthen monitoring and early warning systems;
- increase outreach to farmers and inform them about FAW;
- research to identify effective and sustainable control measures;
- strengthen international collaboration, sharing knowledge and experiences/lessons learned.

## 5. FIELD TRIP

During a one-day field trip in Yunnan province, organized by MARA, many examples for FAW management using biological control approaches, including trapping and mating interruption, were showcased. During the last year, China has invested significantly in identifying new technologies for monitoring and sustainable management of FAW.

These include, amongst others, the use of radar to monitor the spread of FAW, pheromone traps for mating disruption, breeding facilities for natural enemies, and biopesticides.

Technology and products demonstrated in the field visit included:

Monitoring and early warning tools	Sustainable management approaches
<ul style="list-style-type: none"> <li>■ FAMEWS</li> <li>■ Pheromone trapping system</li> <li>■ Pheromone based automatic monitoring system</li> <li>■ Radar and high altitude trapping monitoring system</li> </ul>	<ul style="list-style-type: none"> <li>■ Pheromone lure</li> <li>■ Mass trapping tools</li> <li>■ High altitude trapping killing</li> <li>■ FAW Kairomone attractants</li> <li>■ Mating disruption</li> <li>■ Natural enemies (<i>Trichogramma</i> spp. <i>Picromerus lewisi</i>, and <i>Arma chinensis</i>)</li> <li>■ Biopesticides</li> <li>■ Drone application of pesticides and dispensers.</li> </ul>

The participants also visited a Chinese FFS in a nearby village to gain insights into how China supports its farmers with knowledge on FAW management practices.

**Farmer training courses are an important means to show farmers what FAW is and how to manage it with sustainable actions in the field**



## 6. DISCUSSIONS

The participants had active discussions and identified key challenges and priorities for sustainable FAW management in the region.

### Gaps and challenges:

1. Necessary technical knowledge on FAW, including overwintering, conditions for outbreak, migration frequency and route, is weak.
2. Capacity and expertise is limited, and there is a lack of laboratories that can identify and diagnose FAW.
3. Capacity of monitoring and early warning is weak and there is a lack of relevant equipment and complete national monitoring systems.
4. Appropriate biologically-based solutions are lacking.
5. Reliance on chemical pesticides for FAW management, posing risks to human health and the environment. Most pesticides have not been tested and are not registered. Risk of development of pesticide resistances.
6. There is a lack of information sharing and exchange of technology and products on monitoring and management.
7. Unified methods and tools for calculating yield losses are lacking.
8. There is a lack of awareness, education and training on farmers (including IPM and local solutions), especially where the FAW infestation and crop damages are still light.
9. Government support in some countries should be enhanced.
10. Funds are insufficient.
11. Collaboration and coordination are weak.

### Priorities:

1. Strengthen research on FAW biology, migration and detecting methods;
2. Enhance capacity of early detection and early warning, and share data and information;
3. Develop, test and demonstrate biological IPM practices and exchange technology and products, in particular natural enemies and biopesticides;
4. Provide education and training to farmers and raise awareness;
5. Enhance regional cooperation on monitoring and early warning, including joint monitoring, in particular among neighbouring countries;
6. Test and register pesticides, and provide guidance on proper use of pesticides in particular chemicals to reduce risks of resistance and impacts to human health and the environment;
7. Develop short-term and long-term regional strategy for FAW management and enhance global and regional coordination and cooperation;
8. Strengthen policy and financial support, in particular establishing a sustainable global financial mechanism.
- 9.

## 7. FOLLOW-UP ACTIONS

- FAO should modify FAMEWS and translate it into local languages, enabling its use in Asian countries.
- National governments should develop national FAW programmes to strengthen policy and financial support for FAW control.
- Participating countries should strengthen research on FAW biology and management and share results.
- Participating countries should enhance their capacity of monitoring and early warning and conduct joint monitoring and information sharing through the established working group with the support of FAO. China provides monitoring equipment and products for testing and adaptation to requesting countries to strengthen their capacities.
- Participating countries should develop biologically-based IPM for sustainable management of FAW and share innovative technology and methods in the region.
- Testing, selection and registration of low risk pesticides for FAW control should be undertaken by countries to reduce the risks of pesticides to human health and the environment and of developing resistance. FAO and countries should mobilize resources to support implementation of the global and regional FAW programmes.

## ANNEX I – FULL PROGRAMME

### Day 1. November 11, Monday

Arrival of participants and registration

### Day 2. November 12, Tuesday

9.00–9.40	Opening and Welcome	Chaired by Ma Hongtao, MARA
9.00–9.10	1. Opening address given by Xie Hui, Director, Yunnan Agriculture and Rural Areas Department	
9.10–9.20	2. Special address given by Hans Dreyer, Director Plant Production and Protection Division, FAO	
9.20–9.30	3. Opening address given by Pan Wenbo, Director, Department of Crop Production, MARA, China	
9.30–10.00	Group photo and tea break	
10.00–11.50	Keynote speeches:	Chaired by Wei Qiwen, NATESC
10.10–10.40	1. Global views on sustainable management of FAW	Baogen Gu, FAO
10.40–11.10	2. FAW monitoring and IPM in China	Wu Kongmin, Academician of Chinese Engineering
11.10–11.40	3. FAW Monitoring and Early Warning System (FAMEWS)	Keith Cressman, FAO
11.40–12.00	Questions and discussion	
12.00–13.00	Lunch	
14.00–18.00	Country presentations on current situation, results of first year, and priorities. (10 Minutes per country)	Chaired by Keith Cressman, FAO
14.00–15.50	Bangladesh, Cambodia, China, India, Indonesia, Japan, Laos	
15.50–16.20	Tea break	
16.20–18.00	Myanmar, Pakistan, The Republic of South Korea, Sri Lanka, Thailand, Viet Nam	
18.30	Welcome dinner	

### Day 3. November 13, Wednesday

Field Visit & Discuss on Collaboration

08.00–12.00	Field visit	National Agricultural Technology Extension and Service Centre (NATEC), MARA & Yunnan province
	Site 1: FAW Monitoring and Control Station	
	Site 2: Demonstration of IPM and Farmer Field Schools	

12.00–13.00	Lunch	
14.00–17.30	Panel discussion on Challenges and future priorities	Chaired by Baogen Gu, FAO
	1. Challenges and priorities for sustainable management of FAW in the region.	
	2. Joint actions and collaborations on Monitoring and Early Warning, including FAMEWS, and possible mechanisms of joint monitoring, information sharing, technology exchange, coordinated prevention of FAW spread ---- China's initiative.	
18.00	Dinner	

<b>Day 4. November 14, Thursday</b>		<b>Chaired by FAO</b>
8.30–10.00	Discussion: Strengthen regional collaboration on FAW sustainable management.	
	1. Strengthen the regional coordinated actions and collaboration including information sharing, training workshops on monitoring and early warning, annual regional meeting/workshop	
	2. Set a working group on FAW management under APPPO (Asia Pacific Plant Protection Committee).	
10.00–10.20	Coffee break	
10.20–12.30	3. Revising and getting agreement on action plans on information sharing and regional coordinated activities on FAW management.	
	4. Funding mechanism for FAW programme - exploring the possibility to establish a Multi-Partner Trust Fund for global FAW management (presented by Liu ZhongWei, FAO).	
12.30–13.00	Closing session	Chaired by Wei Qiwen, NATESC
12.30–12.45	1. Closing remarks by FAO	
12.45–13.00	2. Closing remarks by China MARA	
13.00–14.00	Lunch	
<b>Day 5: November 15, Friday</b>		
Departure of the participants		

## ANNEX 2: LIST OF PARTICIPANTS

### REGIONAL WORKSHOP ON FAW, CABO VERDE, 21-24 OCTOBER 2019

NAME	LAST NAME	TITLE	ORG	COUNTRY
Debasish	Sarker	Chief Scientific Officer and Head	Entomology Division, Bangladesh Agricultural Research Institute	BANGLADESH
Maksuma	Akter Banu	Deputy Secretary	Ministry of Agriculture	BANGLADESH
Begum	Morsheda Akter	Deputy Secretary	Ministry of Agriculture	BANGLADESH
Md. Enayet	Hossain	Deputy Director	Planning, Project Implementation and ICT Wing Department of Agricultural Extension, Dhaka	BANGLADESH
Md Mostafizur	Rahman Shah	Senior Scientific Officer	Bangladesh Wheat and Maize Research Institute Nashipur, Dinajpur	BANGLADESH
Oeurn	Samoul	Vice Chief	Plant Protection Technology Research and Development and Pest Diagnostic Office, Department of Plant Protection Sanitary and Phytosanitary, GDA/MAFF	CAMBODIA
Choem	Channa	Technical Officer	Plant Protection Office, Department of Plant Protection Sanitary and Phytosanitary, GDA/MAFF	CAMBODIA
Zhu	Enlin	Deputy Director General	Department of Crop Production of MARA	CHINA
Fakih	Zakaria	Directorate of Food Crop Protection, DG of Food Crop	Ministry of Agriculture	INDONESIA
Dewi	Sartiami	Plant Protection Department	IPB University	INDONESIA
Ren	Iwaizumi	Chief, Entomology Section	Research division of Yokohama Plant Protection Station, MAFF	JAPAN
Yasuhiro	Nakanishi	Deputy Director	Plant Protection Division, Ministry of Agriculture, Forestry and Fisheries	JAPAN
Jong-Ho	Lee	Deputy Director (Senior Researcher/ Entomologist)	Disaster Management Division, Rural Development Administration	REPUBLIC OF KOREA
Siriphonh	Phithaksoun	Director	Plant Protection Center, Department of Agriculture, MAF	LAOS
Khanxay	Somchinda	Deputy Director	Plant Protection Center, Department of Agriculture, MAF	LAOS
Yie Yie	Myint	Staff Officer	Department of Agriculture, MoALI	MYANMAR
Thein	Win	Assistant Director	Department of Agriculture, MoALI	MYANMAR
KNC	Gunewardena	Principal Scientist (Entomology)	FCRDI, Mahailluppallama	SRI LANKA
R.S.C.W.M.A.B.M.	Wijayatunga	Assistant Director of Agriculture (Development)	Extension & Training Centre, Peradeniya	SRI LANKA
Pruetthichat	Punyawattoo	Senior Entomology Specialist	Plant Protection Research and Development Office, Dept. of Agriculture, Ministry of Agriculture and Cooperatives	THAILAND
Siwilai	Lapbanjob	Senior Agricultural Research Specialist	Field and Renewable Energy Crops Research Institute, Dept. of Agriculture, Ministry of Agriculture and Cooperatives	THAILAND
Bui Xuan	Phong	Director	Plant Protection Division	VIET NAM
Nguyen Huy	Khanh	Vice Director	North Central Region Plant Protection Centre	VIET NAM
Keith	Cressman	Senior Agricultural Officer	Plant Production and Protection Division, FAO	
Hans	Dreyer	Director	Plant Production and Protection Division, FAO	
Baogen	Gu	Senior Agricultural Officer	Plant Production and Protection Division, FAO	
Zhongwei	Liu	Senior Programme Officer	Business Development and Resource Mobilization Division, FAO	
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## ANNEX 3: PROPOSAL ON VOLUNTARY JOINT ACTIONS ON SUSTAINABLE FAW MANAGEMENT IN ASIA.

Fall Armyworm (FAW) is a major transboundary agricultural insect pest that has become one of the most significant threats to food security and agricultural sustainability worldwide. After it first invaded South Asian countries in 2018, FAW quickly spread within the region and is now present in 15 countries – Yemen, India, Sri Lanka, Bangladesh, Myanmar, Thailand, Lao People’s Democratic Republic, Viet Nam, Cambodia, China, Republic of Korea, Japan, Malaysia, Philippines and Indonesia. For the purpose of reducing infestations and potential losses caused by FAW in Asia, sustainable management of this new pest requires regional collaboration, including sharing of information and experiences, and carrying-out coordinated actions on monitoring and early warning. Therefore, the following joint actions on the sustainable management of FAW in Asia are proposed:

- 1. Monitoring Fall Armyworm.** All countries should strengthen cooperation on monitoring and control of FAW and carry out joint monitoring activities with neighboring countries. Every country should adopt and regularly use the Fall Armyworm Monitoring and Early Warning System (FAMEWS) by officially endorsing the system and training users. This will ensure a more efficient and standardized approach to data collection and monitoring of FAW infestations and their migration in all countries. It will facilitate data and information sharing amongst Asian countries to allow the provision of timely and accurate early warning. The FAMEWS app should be translated into local languages to encourage widespread usage. It should be used each time a field is scouted and a pheromone trap is checked for FAW. The FAMEWS data will be made available on the FAMEWS global platform and updated on a daily basis so that all countries will know the very latest FAW situation. The use and maintenance of the mobile app and the global platform will be free of charge without the need for annual licenses or monthly subscription charges. Alternatively, a country could choose to use its own national system and share its data on the FAMEWS global platform. The development of a standardized yield loss assessment tool is envisaged.
- 2. Establishing FAW information sharing mechanisms.** In addition to the regular use of FAMEWS, countries agree to share information on FAW, including infested crop varieties, incursion areas, distribution, actions taken, research results, and progress on controlling FAW through the FAMEWS global platform, the International Plant Protection Convention, and other information exchange mechanisms.
- 3. Sharing FAW monitoring and management experiences.** Countries agree to share experiences and lessons learnt on monitoring and sustainable management of FAW through annual workshops. The workshops could be hosted rotationally or voluntarily by relevant countries. Expert study-tours and activities on the exchanges of IPM technologies could be organized amongst the concerned countries as needed. Experts from more experienced countries could organize technical workshops in southern countries and share lessons learnt on responses to FAW. A South-North exchange could be established for scientists and students to learn from those countries that have had more success in sustainable FAW management. In addition, experiences and lessons learnt from the Americas and Africa could be shared through the South-South Cooperation mechanism.
- 4. Promoting sustainable FAW management in Asia.** In order to reduce the reliance on pesticide use and as pesticides are not economically viable for most smallholder farmers, countries agree to implement Integrated Pest Management (IPM) strategies for managing the FAW. The use of biological control options and the enhancement of natural enemies in the field should be emphasized to safeguard human health and the environment, and to avoid pesticide resistance. In order to reduce pesticides and their associated risks, a list of recommended pesticides (to be used only as a last resort) will be developed.
- 5. Strengthening policy and financial support.** Governments and all other stakeholders are encouraged to strengthen their policy and financial support for sustainable FAW management. In addition, FAO should explore all appropriate mechanisms to mobilize the necessary resources.

All countries are committed to support farmers to implement the above-mentioned actions. Education and training of extensionists and farmers will be made a priority in all countries.

In order to ensure that the above-mentioned joint actions on the sustainable management of FAW in Asia are carried out smoothly, it is suggested that each country nominates one or two focal persons. These persons will be responsible for promoting the implementation of the joint actions. It is proposed to establish a working group under the APPPC, consisting of the national focal person(s).

Under the guidance of a rotating secretariat, a working group could be established, hosted by one country, starting with China.

**The proposal for joint actions was endorsed by:**

Bangladesh, Cambodia, China, Indonesia, Japan, Lao People's Democratic Republic, Myanmar, Republic of Korea, Sri Lanka, Thailand, and Viet Nam.

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## MORE INFORMATION

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