Food Security Cluster Workshop on Fall Armyworm (FAW) and Lumpy Skin Disease (LSD) Outbreak Linked to Agricultural Emergency

Dr. Mohammad Shaef Ullah
National Pest Management Expert, FAO

19 January 2020

Food and Agriculture Organization of the United Nations

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Presentation Outline

1. Background information

- Fall armyworm invasion – Bangladesh

2. Economic importance of fall armyworm

- Threat to agricultural stability
- Yield losses

3. Interventions and achievements

- Activities carried out
- Outcomes

4. Sustainable management initiatives

- Sustaining action plan
- Addressing knowledge & technological gaps

Disasters

Disasters can be broadly classified into two groups:

Natural disasters
Manmade disasters

Affect food production, food security, food chain crises and people's livelihoods.

Natural disasters: Between 2005 and 2015
- $96 billion in damaged or lost crop & livestock production.
Half of that damage $48 billion worth – occurred in Asia

Manmade disasters: A first case study done on the impacts of conflict in Syria.
- cost of damage and loss in agriculture sector was at least $16 billion (2011–2016).

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Ignored!!!

- **Transboundary plant pests and diseases affect food crops, causing significant losses to farmers and threatening food security.**
- **Transboundary plant pests and diseases can easily spread to several countries and reach epidemic proportions.**
- **Outbreaks and upsurges can cause huge losses to crops and pastures, threatening the livelihoods of vulnerable farmers and the food and nutrition security of millions at a time.**

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Fall Armyworm

Fall armyworm (FAW) **having a preference for maize and other cereals, an outbreak threatens to further undermine the food security of families that can ill afford another crisis.**

- **The pest is known to cause 100 percent crop losses.**
- **The FAW has affected the grain basket of Kenya and hence can lead to serious food shortage in the country.**

Fall Armyworm Description

Fall armyworm (FAW), *Spodoptera frugiperda*, is a plant pest with larvae (caterpillars) as the destructive stage

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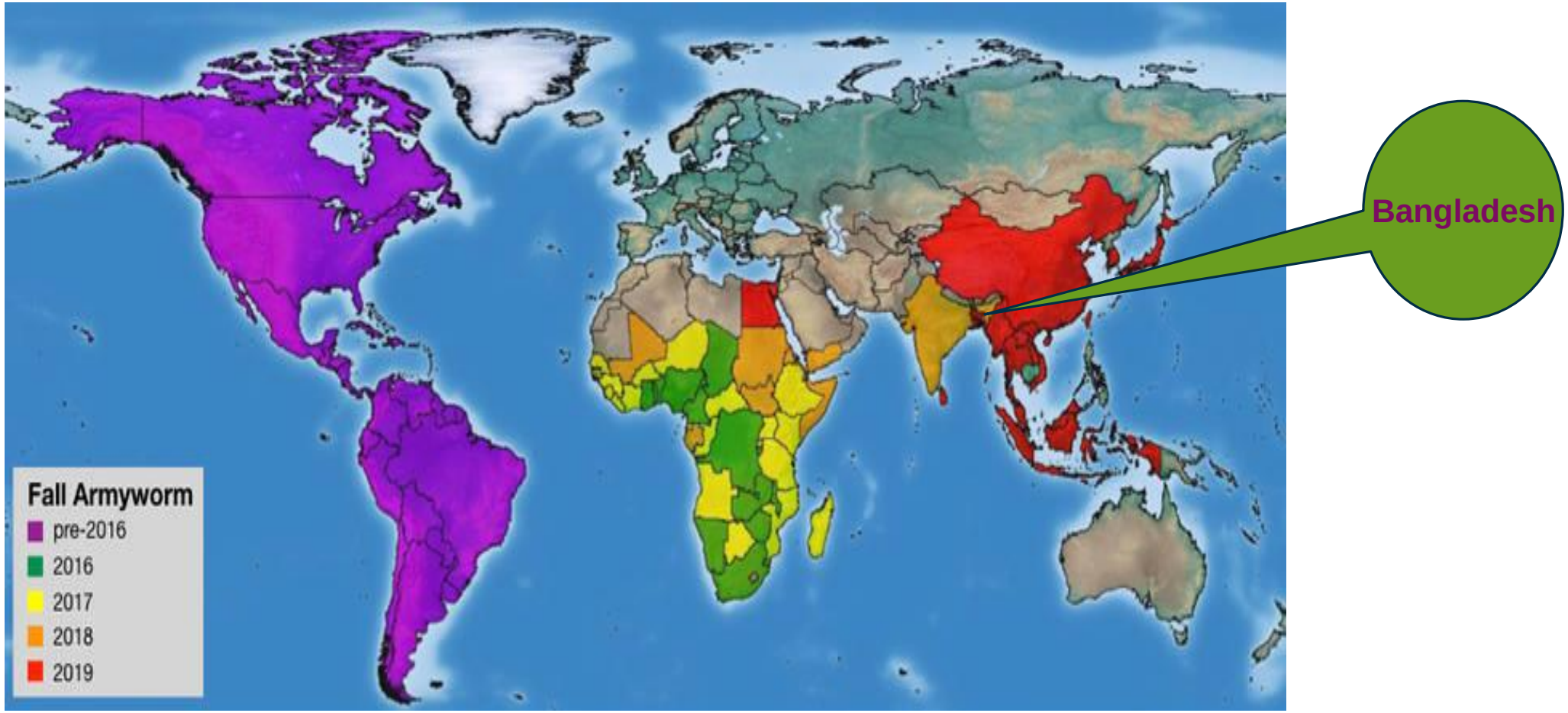
The spread of FAW since 2016 (as of July 2019)



SOURCE: FAO, 2019

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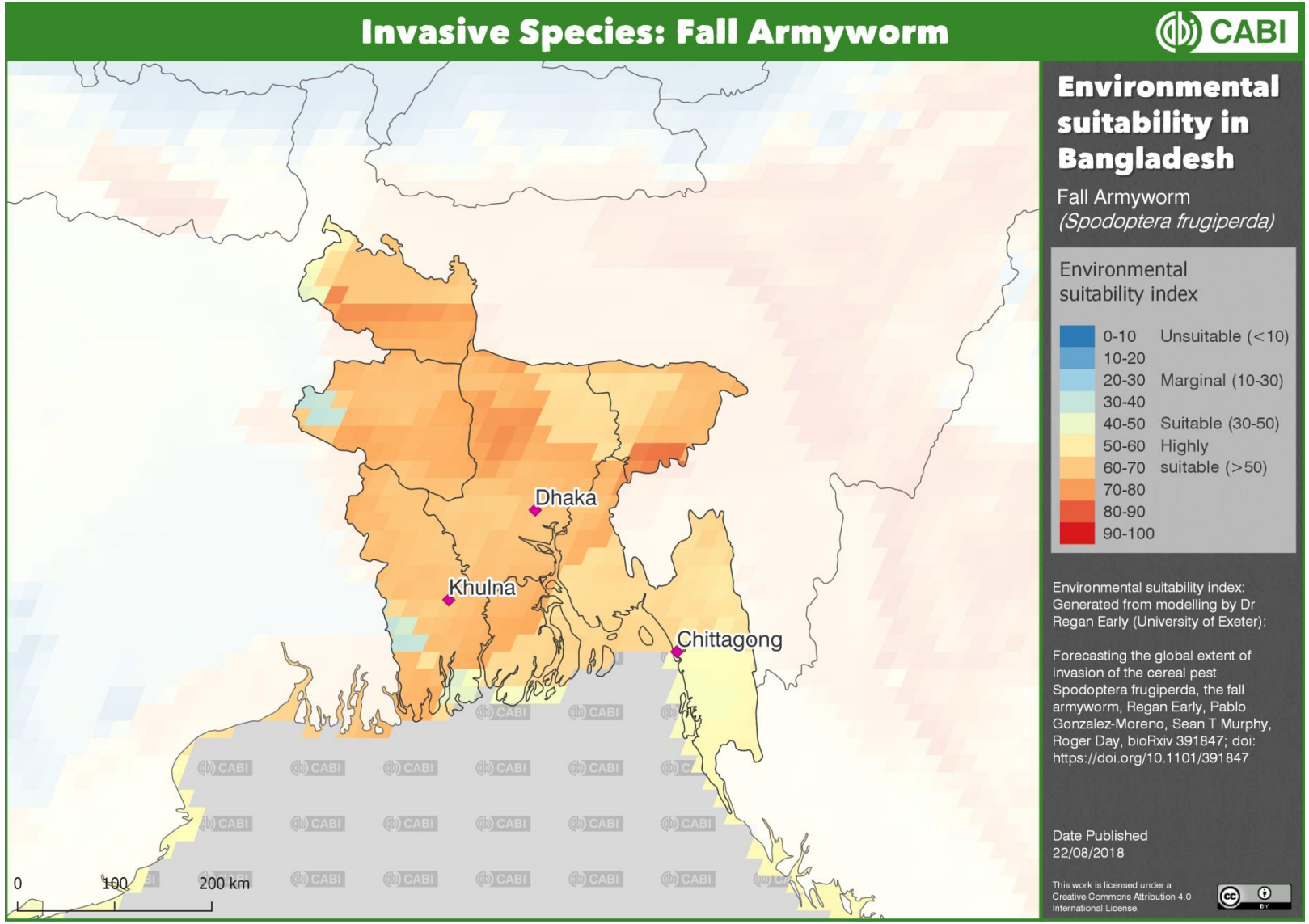
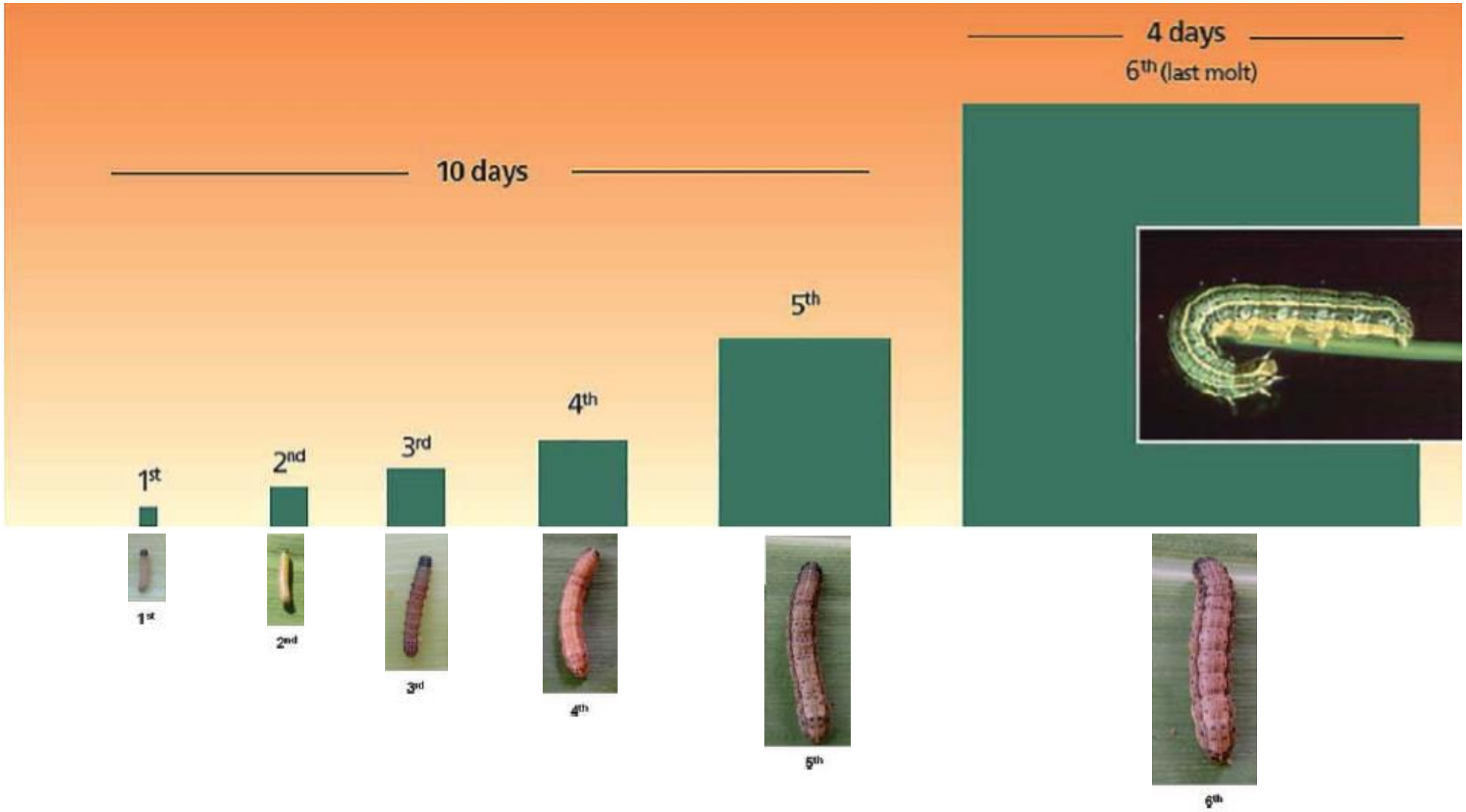


Environment of Bangladesh is very much suitable for FAW infestation and outbreak



Relative amounts of food eaten by a FAW caterpillar during different growth stages. **(Source: Flanders KL, Ball DM, Cobb PP, Revised May 2017, ANR-1019 Alabama Cooperative Extension System).**

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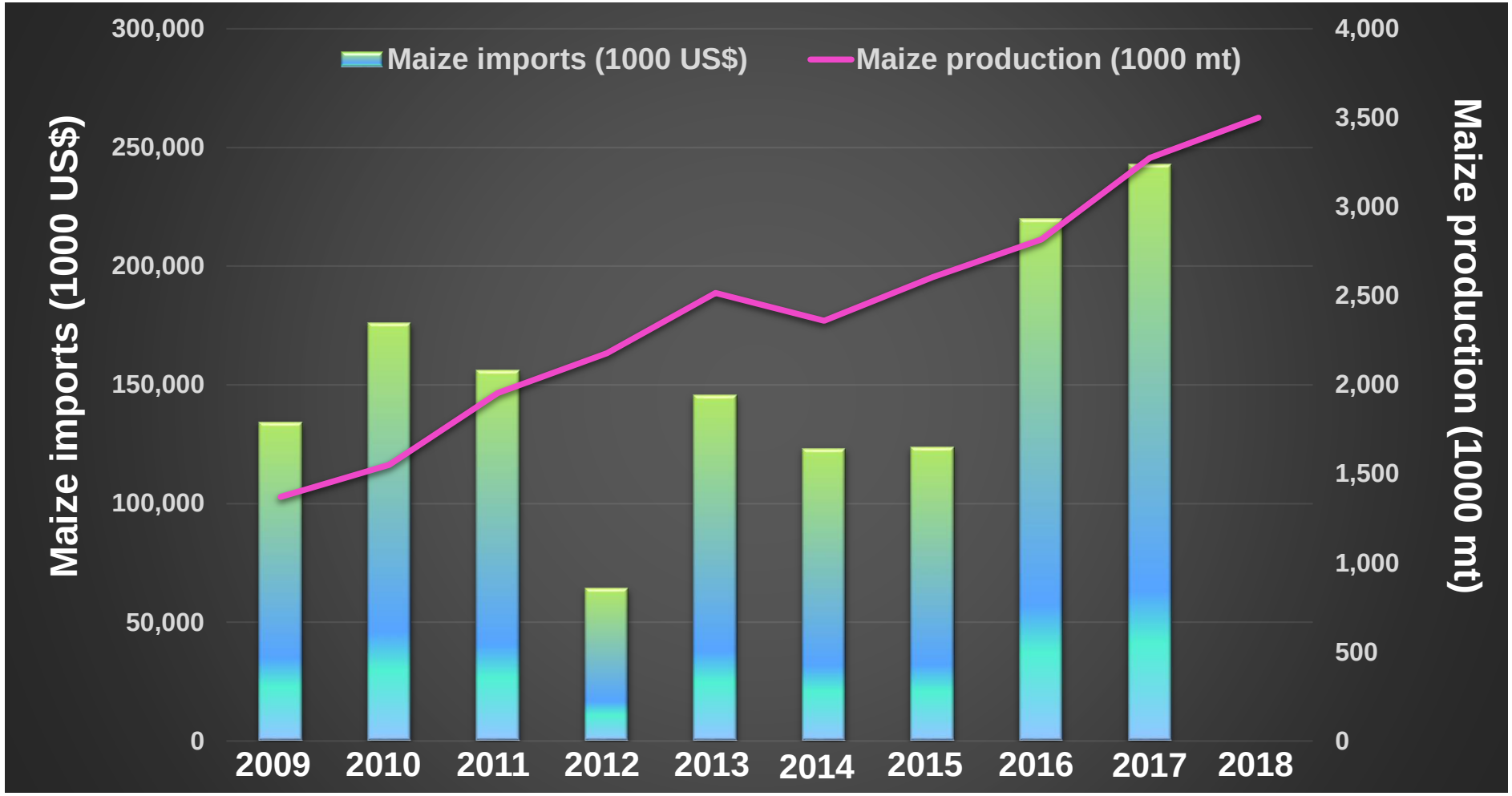
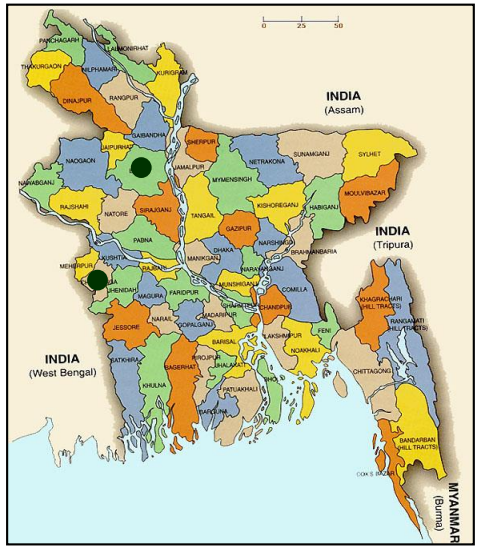
Maize Production and Import in Bangladesh



SOURCE: WORLD DATA ATLAS

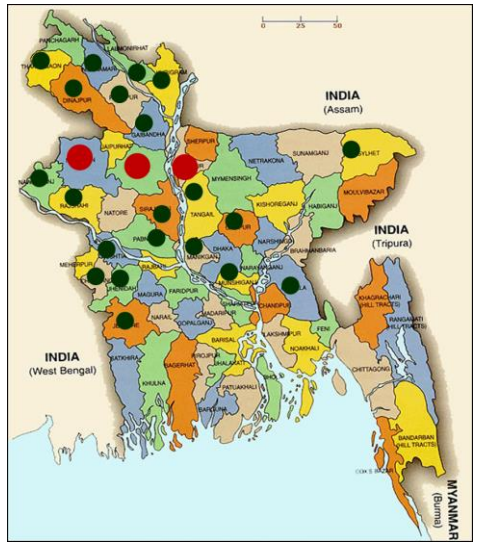
Fall Armyworm is Invasive and Migratory

Rapid spread in Bangladesh



November 18 – June 19

Increase in Infested Areas



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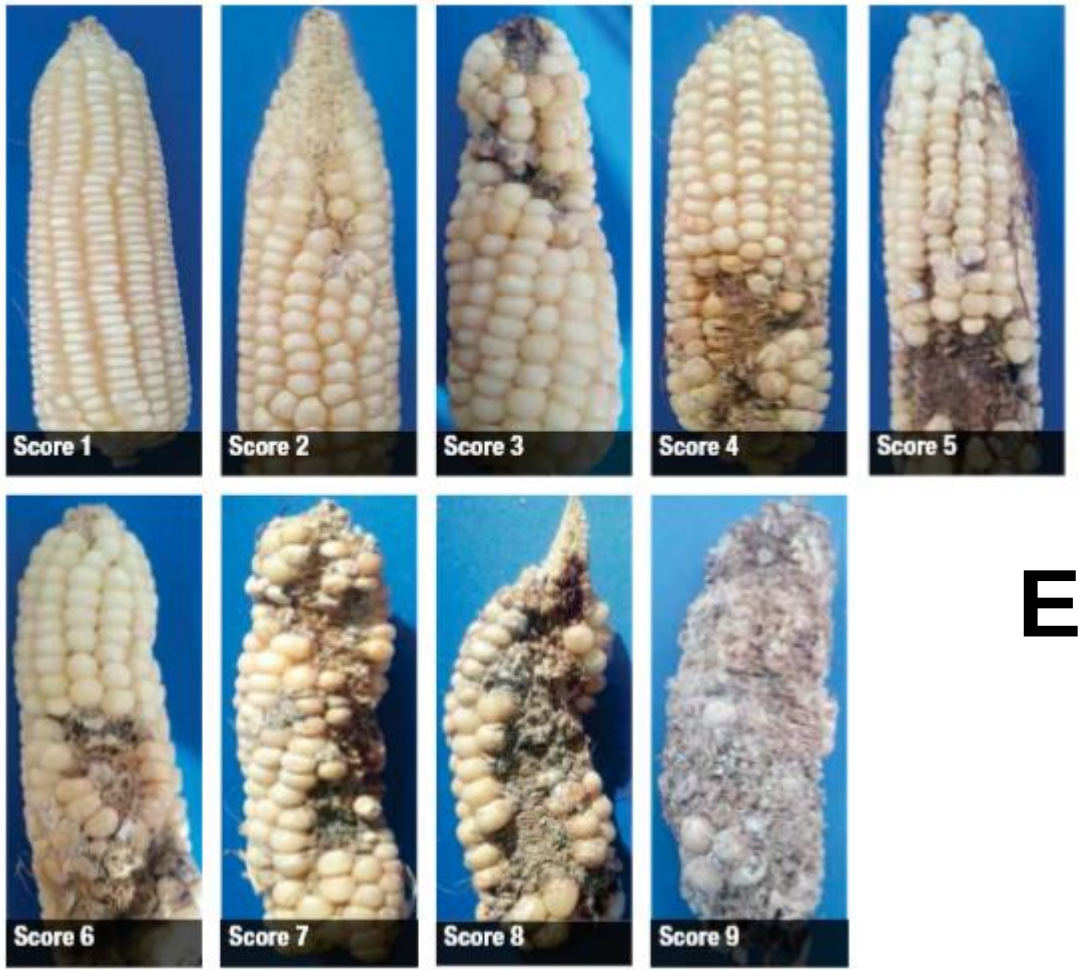
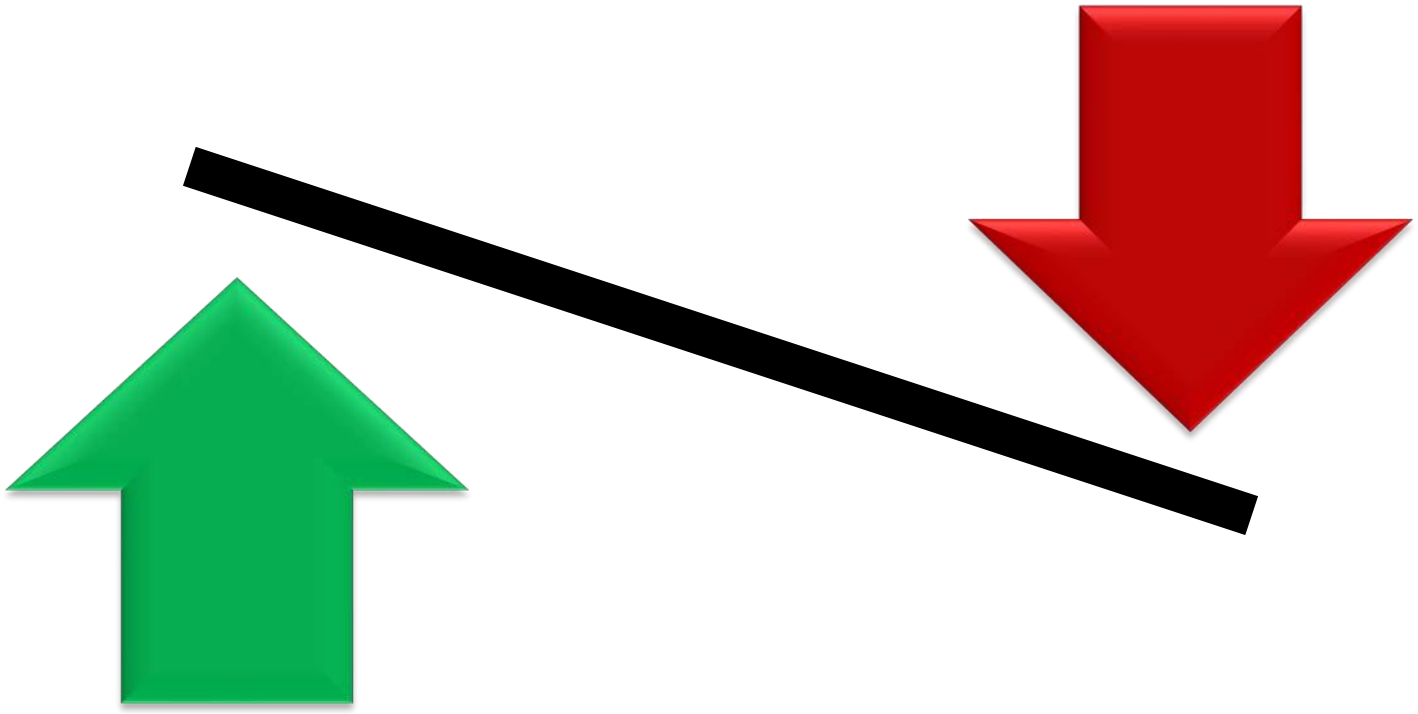


Economic Importance of Fall Armyworm

Food and Economic Instability

Fall armyworm has affected agricultural balance

Reduce losses and costs caused by pests, diseases & other factors



Increase productivity and efficiency of sustainable agribusiness value chains

Fall Armyworm has Become Important

- **Maize is the most preferred host of FAW**
  - FAW also noted on other crop plants e.g. sorghum & wheat
  - **Literature information:** FAW attacks over 80 plants species

The pest threatens:

- **Food and nutrition security**
- **Feeds industry**
- **Employment**
- **Trade**

- **Maize is one of the main staple crop in Bangladesh**
- **The demand is increasing in Bangladesh**

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Interventions and Achievements

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Intervention Points in Bangladesh

DhakaTribune

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Bangladesh receives FAO support to fight Fall Armyworm

Reaz Ahmad

Published at 09:46 pm May 26th, 2019

A Fall Armyworm (FAW) Collected

USDA warns against spread of the plant-eating caterpillar in China, the pest also

Bangladesh increases efforts to fight fall armyworm

Experts discussed the status of the outbreak, the role of research and applicable measures.

By Sultana Jahan, M. Shahidul Haque Khan and Cynthia Mathys

May 30, 2019

Researchers, policymakers and other agricultural partners participated in the workshop on fall armyworm. (Photo: Uttam/CIMMYT)

The International Maize and Wheat Improvement Center (CIMMYT) and the Bangladesh

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- **12500 Pheromone trap**
- **25000 lure (attractant)**
- **37500 killing strip**
- **30 mobile set for early warning**

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Hands on Training on Pheromone Trap for Fall Armyworm

- **14 Regions of DAE**
- **Started from 10 December**
- **Class room and field demonstration**

Hands on Training on Pheromone Trap for Fall Armyworm

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Training for Capacity Building

Resource person from 4 leading Agricultural University in Bangladesh

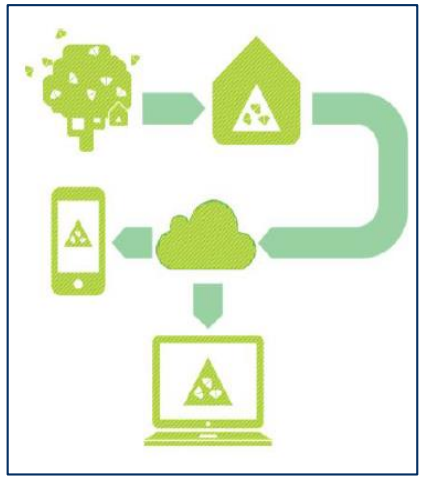
- **Bangladesh Agricultural University**
- **Shere-E-Bangla Agricultural University**
- **Patuakhali Science and Technology University**
- **Sylhet Agricultural University**

- **64 Districts**
- **100 batch**
- **30 Participants in 1 batch**
- **Total 3000 participants**

E-pest Surveillance

Solar Based Automated Monitoring System

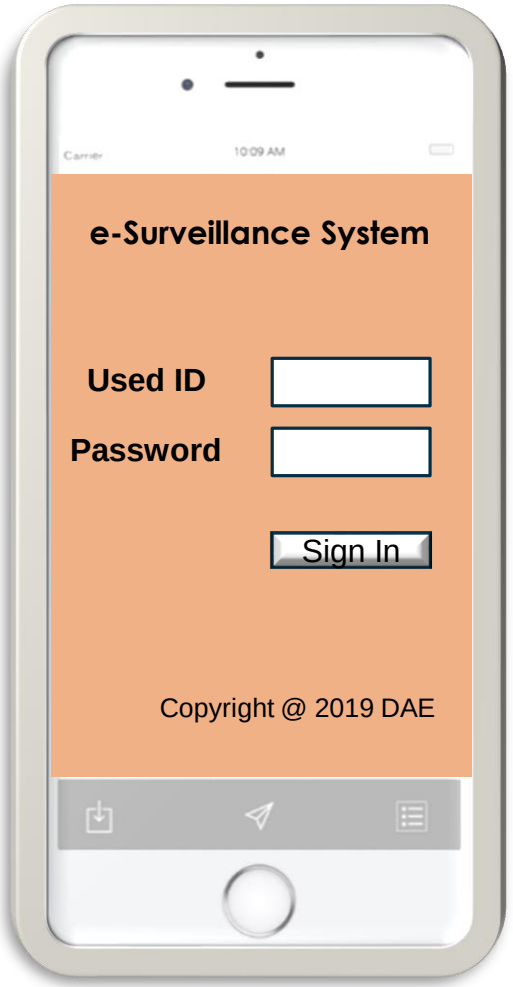
Consist of automated pest monitoring trap
- a solar panel and a battery
- several HD cameras
- a modem
- GPS
- Optional self cleaning mechanism
- Other advanced electronics that collect data, take picture and send them to the cloud-based IT platform



Better, more informed and timely crop protection decisions can be made based on the provided information

Image of trapped insect inside the pest monitoring trap

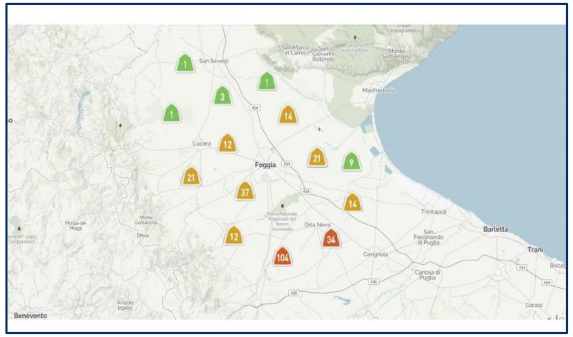
Monitoring in mobile



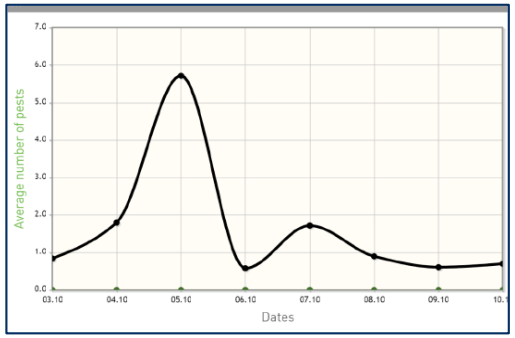
Observation of trapped insects in the mobile app

Monitoring in desk

Area-wide overview



Area-wide overview–network average catch



Trapped insects data in computer (responsive)

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Intervention Points in Bangladesh

1. Harnessing Technical Expertise to guide management of FAW- National taskforce
2. Assessment of FAW infestation and spread in Bangladesh
3. Issuance of alerts/advisories
4. Consolidation & dissemination of technical information materials
5. Information sharing & awareness creation
6. Authorization of pesticides for interim use & efficacy evaluation
7. Launching of nation-wide control campaigns & emergency response
8. Research to bridge knowledge and technological gaps

1. HARNESSING TECHNICAL EXPERTISE

- Multi-Institutional Technical Team (FAW-MITT)
  - Several institutions are participated
  - Team has been working on capacity building in implementation of strategies of managing FAW

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CABI

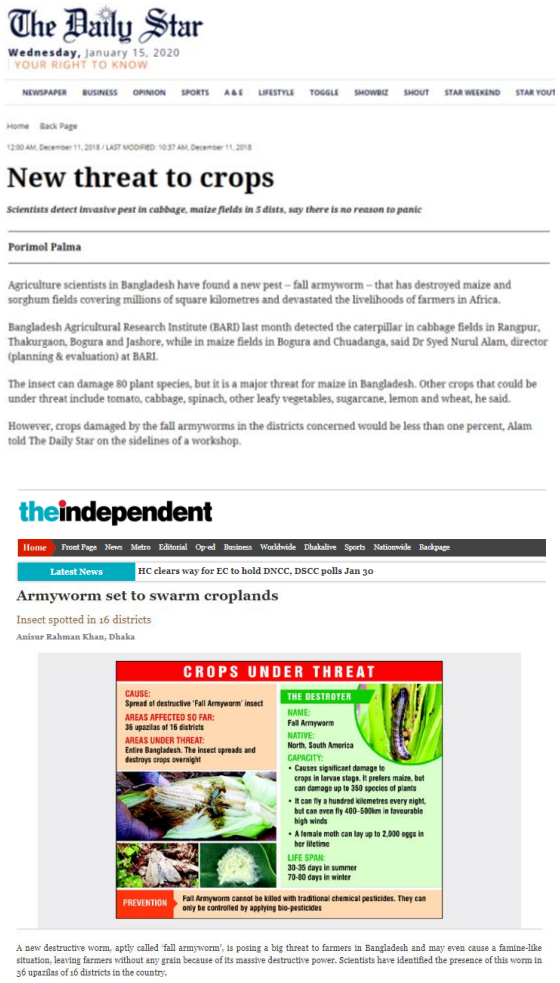
2. ASSESSMENT OF FAW INFESTATION AND SPREAD IN BANGLADESH

- **Assessments done to guide plans for action**
  - **March 2019:** First survey - confirmation of FAW in 24 Districts by BARI
  - **2019-2020:** Rapid survey by CIMMYT, FAO

3. ISSUANCE OF ALERTS/ADVISORIES

❑ Alerts issued by DAE

- ➢ To trigger surveillance, resource mobilization and action



The Daily Star

Wednesday, January 15, 2020

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12:00 AM, December 11, 2018 / LAST MODIFIED: 10:37 AM, December 11, 2018

New threat to crops

Scientists detect invasive pest in cabbage, maize fields in 5 dists, say there is no reason to panic

Porimol Palma

Agriculture scientists in Bangladesh have found a new pest – fall armyworm – that has destroyed maize and sorghum fields covering millions of square kilometres and devastated the livelihoods of farmers in Africa.

Bangladesh Agricultural Research Institute (BARI) last month detected the caterpillar in cabbage fields in Rangpur, Thakurgaon, Bogura and Jashore, while in maize fields in Bogura and Chuadanga, said Dr Syed Nurul Alam, director (planning & evaluation) at BARI.

The insect can damage 80 plant species, but it is a major threat for maize in Bangladesh. Other crops that could be under threat include tomato, cabbage, spinach, other leafy vegetables, sugarcane, lemon and wheat, he said.

However, crops damaged by the fall armyworms in the districts concerned would be less than one percent, Alam told The Daily Star on the sidelines of a workshop.

theindependent

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Latest News HC clears way for EC to hold DNCC, DSCC polls Jan 30

Armyworm set to swarm croplands

Insect spotted in 16 districts

Anisur Rahman Khan, Dhaka

CROPS UNDER THREAT

CAUSE: Spread of destructive 'Fall Armyworm' insect

AREAS AFFECTED SO FAR: 36 upazilas of 16 districts

AREAS UNDER THREAT: Entire Bangladesh. The insect spreads and destroys crops overnight

THE DESTROYER

NAME: Fall Armyworm

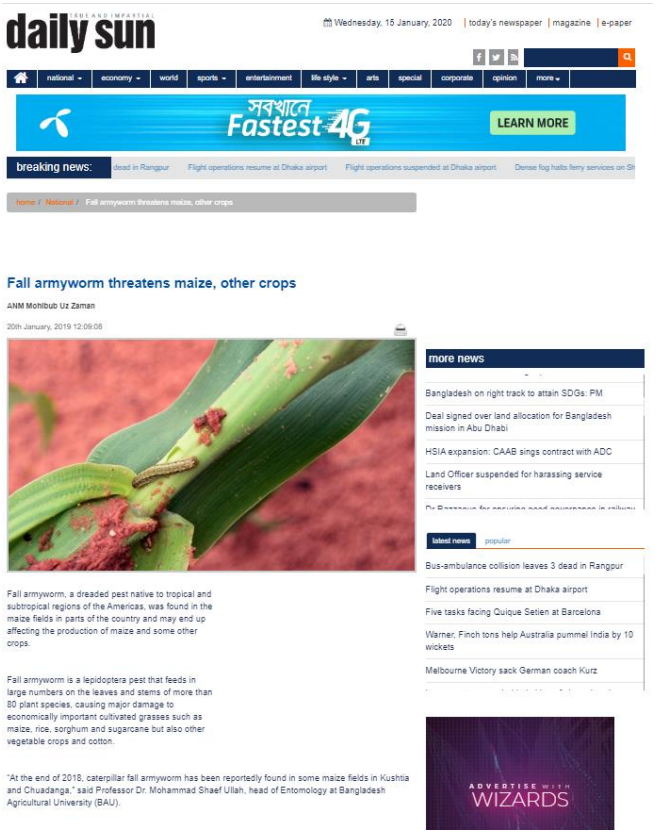
NATIVE: North, South America

CAPACITY:
- Causes significant damage to crops in larvae stage. It prefers maize, but can damage up to 350 species of plants
- It can fly a hundred kilometres every night, but can even fly 400-500km in favourable high winds
- A female moth can lay up to 2,000 eggs in her lifetime

LIFE SPAN: 30-35 days in summer 70-80 days in winter

PREVENTION: Fall Armyworm cannot be killed with traditional chemical pesticides. They can only be controlled by applying bio-pesticides

A new destructive worm, aptly called 'fall armyworm', is posing a big threat to farmers in Bangladesh and may even cause a famine-like situation, leaving farmers without any grain because of its massive destructive power. Scientists have identified the presence of this worm in 36 upazilas of 16 districts in the country.



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Fall armyworm threatens maize, other crops

ANM Mohibub Uz Zaman

20th January, 2019 12:09:08

Fall armyworm, a dreaded pest native to tropical and subtropical regions of the Americas, was found in the maize fields in parts of the country and may end up affecting the production of maize and some other crops.

Fall armyworm is a lepidoptera pest that feeds in large numbers on the leaves and stems of more than 80 plant species, causing major damage to economically important cultivated grasses such as maize, rice, sorghum and sugarcane but also other vegetable crops and cotton.

"At the end of 2018, caterpillar fall armyworm has been reportedly found in some maize fields in Kushtia and Chuadanga," said Professor Dr. Mohammad Shaef Ullah, head of Entomology at Bangladesh Agricultural University (BAU).

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TRENDING: Rohingya Crisis Kashmir

Fall armyworm invades crops across Asia, Bangladesh also hit

Reuters | Bea Nong Tor, Thailand/Singapore | Published: 00:10, Jan 11, 2019

A farmer shows a Fall Army Worm in a maize field at Pak Chong district, Nakhon Ratchasima province, Thailand on June 11, 2018. — Reuters photo

Looking out at his empty, red-earth field, Thai farmer Porang Tiandon said his two-week-old maize crop didn't stand a chance against the fall armyworm pest.

'All the 5 rai (3.15 hectare) I planted were all heavily infested,' said the 47-year-old from his farm in Bea Nong Tor town in Pak Chong district, 180 km (130 miles) northeast of the capital Bangkok.

'The worm ate the whole field in three days, leaving so much damage that it wasn't worth saving.'

Fall armyworm, a caterpillar that got the name because it invades cropland in droves, much like an army, has rapidly spread across Asia since it was detected in southern India late last year. Fields in Bangladesh, Myanmar, Vietnam, Indonesia and Taiwan have fallen victim. In Thailand, it has badly affected the country's corn crop, much of which is sold to the animal feed industry.

In recent months, the pest has also been found in 18 of China's 33 provinces and regions and is now threatening to spread across the key corn region in the northeast.

China is the world's second biggest corn consumer and producer.

New Age, Dhaka

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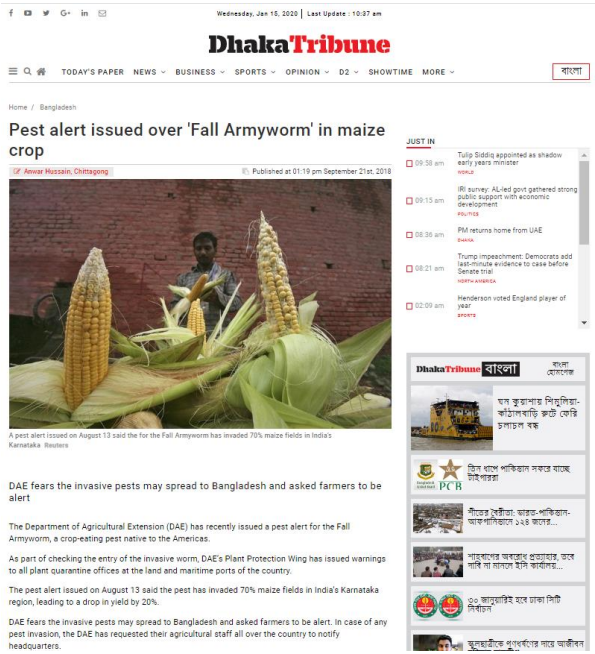

Wednesday, Jan 15, 2020 | Last Update : 10:07 am

DhakaTribune

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Pest alert issued over 'Fall Armyworm' in maize crop

Anwar Hussain, Chittagong

Published at 01:19 pm September 21st, 2018

A pest alert issued on August 13 said the for the Fall Armyworm has invaded 70% maize fields in India's Karnataka Reuters

DAE fears the invasive pests may spread to Bangladesh and asked farmers to be alert

The Department of Agricultural Extension (DAE) has recently issued a pest alert for the Fall Armyworm, a crop-eating pest native to the Americas.

As part of checking the entry of the invasive worm, DAE's Plant Protection Wing has issued warnings to all plant quarantine offices at the land and maritime ports of the country.

The pest alert issued on August 13 said the pest has invaded 70% maize fields in India's Karnataka region, leading to a drop in yield by 20%.

DAE fears the invasive pests may spread to Bangladesh and asked farmers to be alert. In case of any pest invasion, the DAE has requested their agricultural staff all over the country to notify headquarters.

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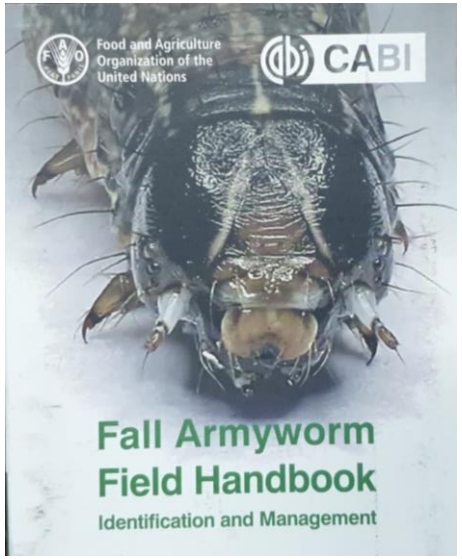
❑ Invasion by FAW caused great panic

4. CONSOLIDATION AND DISSEMINATION OF TECHNICAL INFORMATION MATERIALS ON FAW

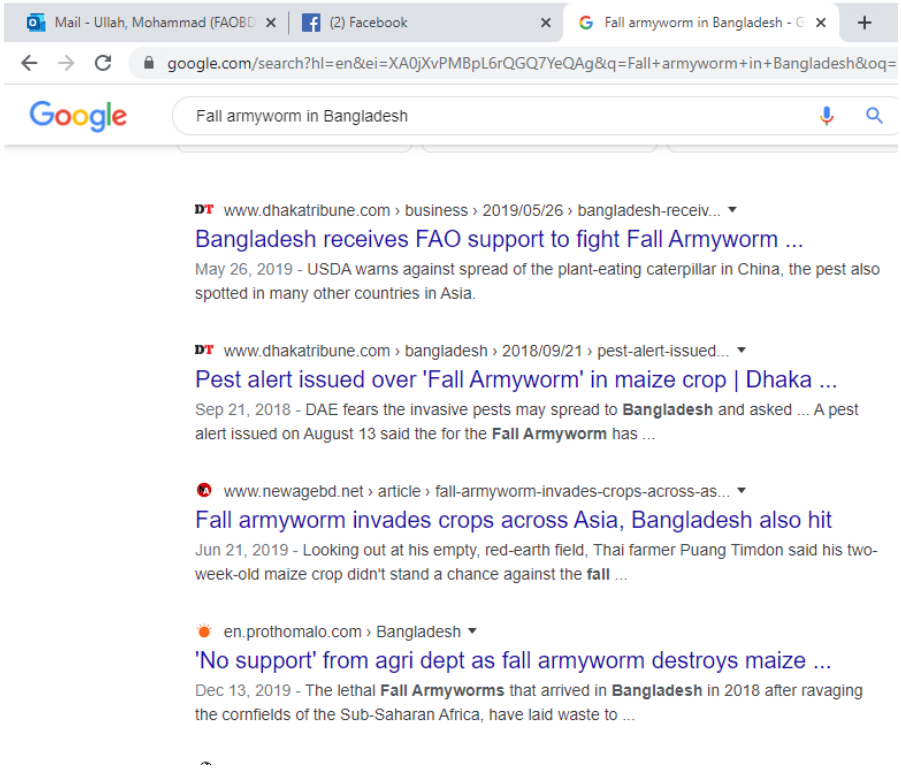
- **Brochures**
- **Field Guide**
- **Posters**
- **Factsheets**

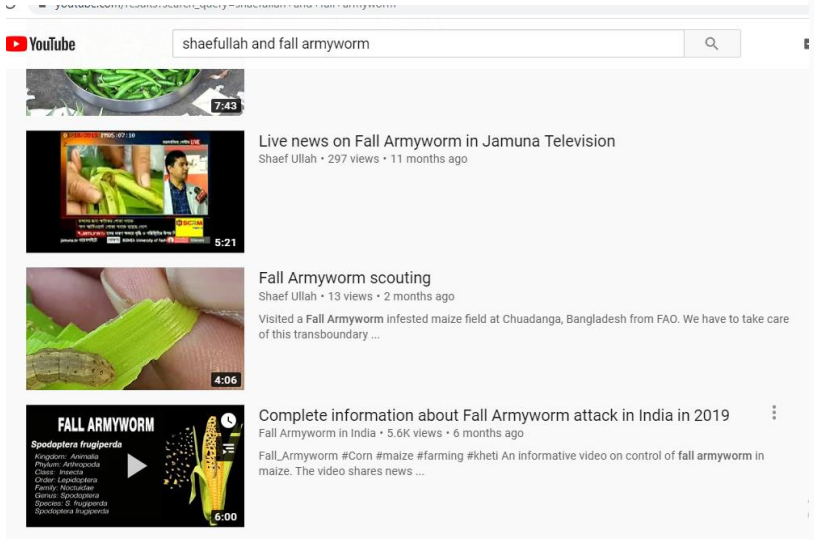


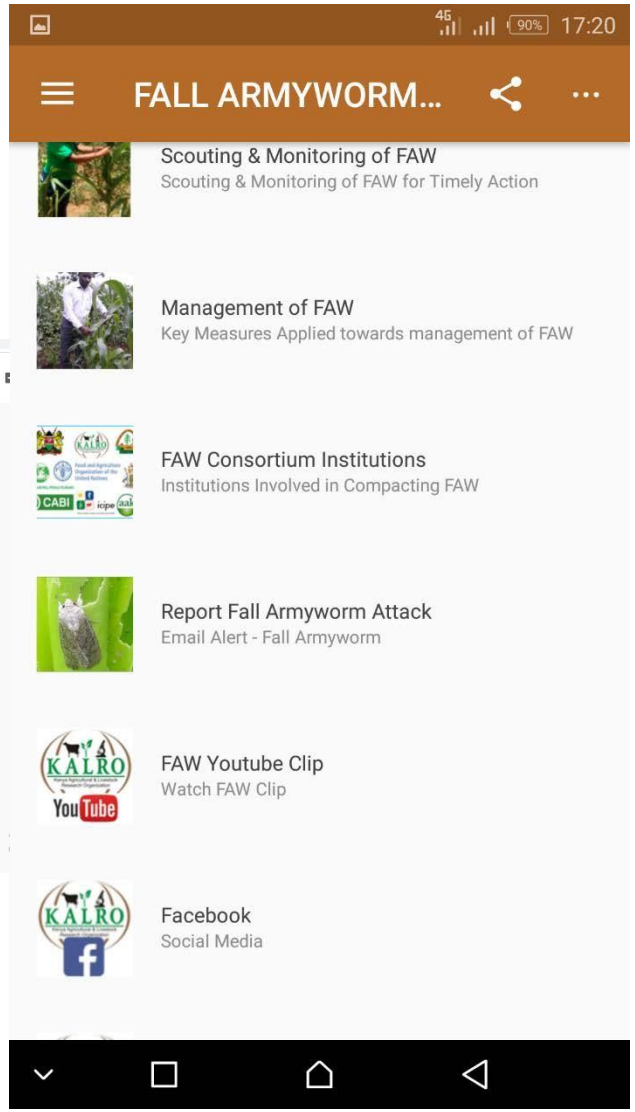
5. INFORMATION SHARING & AWARENESS CREATION

Several channels used

- Mass media – radio, TV, Mobile Apps, YouTube, Web publishing
- Training & extension
- Technical support e.g. through Universities, CABI







6. AUTHORIZATION OF PESTICIDES FOR INTERIM USE & SUBSEQUENT EVALUATION FOR REGISTRATION

- **SfNPV- *Spodoptera frujiperda* Nuclear Polyhedrosis Virus**

NEWER INSECTICIDE FAMILIES

Spinosyns: spinosad (Tracer), spinetoram (Radiant)

Avermectins: emamectin benzoate (Denim)

Oxadiazine: indoxacarb (Avaunt)

Diamides: chlorantraniliprole (Coragen), flubendiamide (Belt)

7. LAUNCHING OF NATION-WIDE CONTROL CAMPAIGNS

8. BRIDGING KNOWLEDGE & TECHNOLOGICAL GAPS

Initial areas of focus

- **Status and socioeconomics of fall armyworm**
- **Tools and techniques for surveillance, monitoring and reporting**
- **Insecticides - effectiveness, application regimes, socioeconomics & safety**
- **Biopesticides, entomopathogenic isolates and botanical extracts**
- **Diversity and host range of fall armyworm**
- **Maize germplasm with resistance**
- **Ecosystem management practices**

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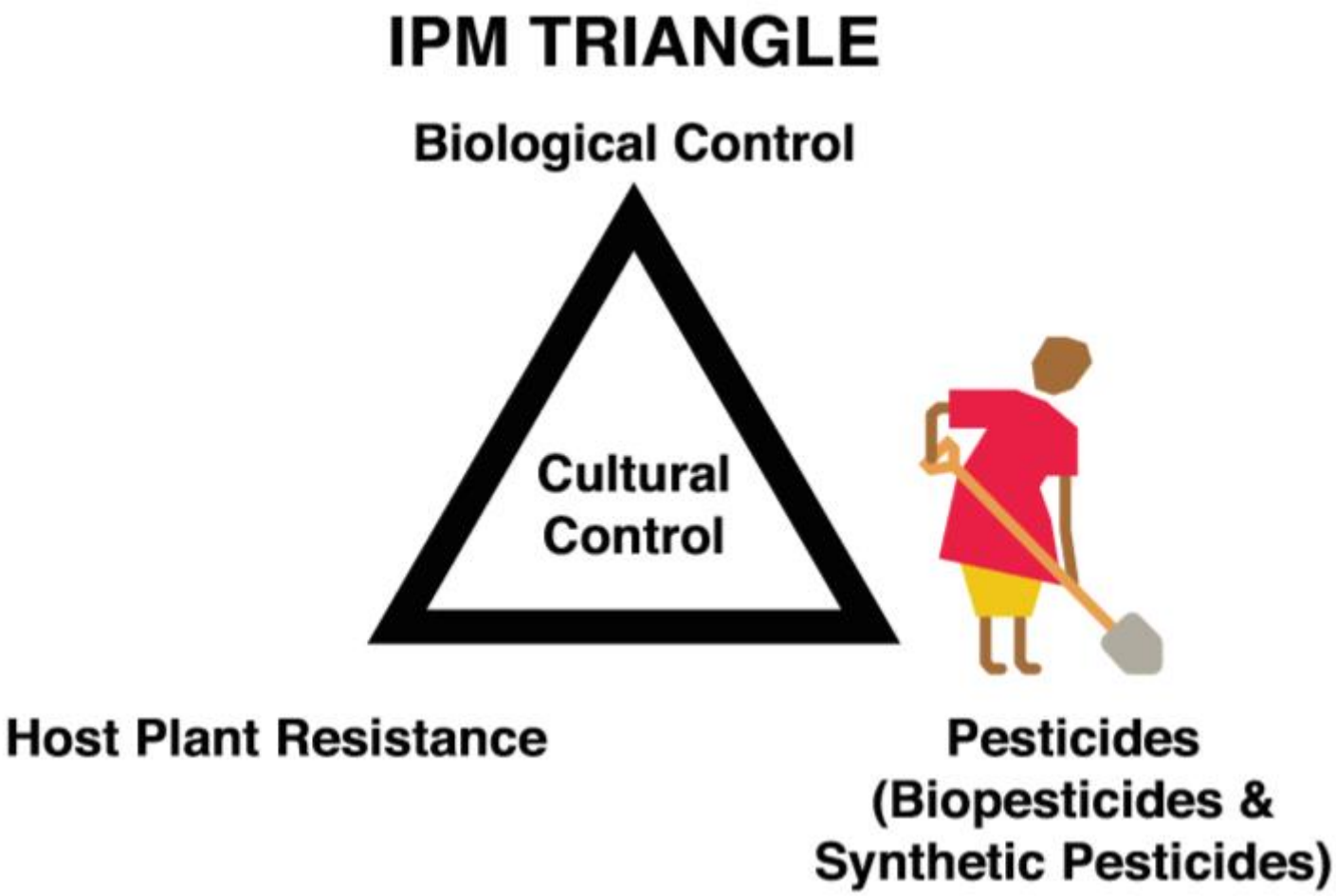
Sustainable management initiatives

…. we need to do more to succeed against FAW

…hence the need for a National FAW Management Strategy

Actions needed



Fall Armyworm Management Strategy

❑ Strategy developed

Goal: Sustainable maize production for enhanced food security, employment creation and improved livelihoods [addressing national development goals and Sustainable Development Goals].

Purpose: Reduce crop losses associated with FAW infestation [lose less; manage costs of production].

Components of FAW management strategy

1. Enhancing awareness, knowledge and skills
2. Impact assessment & immediate actions
3. Surveillance, early warning and reporting
4. Bridging knowledge gaps
5. Policy and regulatory support
6. National implementation and coordination mechanism

Critical Considerations for Success

- ✓ Team-work and strengthening of collaborative efforts are paramount in dealing with emerging pests/diseases.
  - ❖ **Given the diversity of institutions involved, action and reaction time is sometimes very long**

- ✓ Need to innovatively utilize available knowledge, skills and technologies.
  - ➢ Integrated management of pests should be emphasized, always.
    - ❖ **Compatibility of circumstances various optionsunder prevailing**

- ✓ Policy and financial support should be accorded to an institutionalized "*Standing Committee on Crop Pests and Diseases*".
  - ❖ **Readily available resources are vital in dealing with outbreaks**

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THANK YOU