Food and Agriculture Organization
of the United Nations


# SUPPORT FOR DEVELOPING AND IMPLEMENTING MANAGEMENT STRATEGIES IN RESPONSE TO FALL ARMYWORM (FAW) INCURSION IN ASIAN COUNTRIES

February 2022

SDGs:

Countries: Cambodia, Indonesia, Lao People’s Democratic Republic, Nepal and Philippines

Project Code: TCP/RAS/3707

FAO Contribution: USD 500 000

Duration: 1 July 2019 – 31 December 2021

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### Implementing Partners

Ministries of Agriculture.

### Beneficiaries

Government officers, technical and extension workers and farmers in the targeted countries.

### Country Programming Framework (CPF) Outputs

*Cambodia*: Country Outcome 3 – Reduction of vulnerability, and improved resilience to climate change and shocks at national, community and household level.

*Indonesia*: Government Priority 2 – Sustainable intensification of crop production and improved management of forests and fisheries resources.

*Lao People's Democratic Republic*: Government Priority 4 – Improving capacity to respond to food and agricultural threats and emergencies and the impact of climate change.

*Nepal*: Country Priority Outcome 2 – Enhanced natural resource management and agricultural production system resilient to climate change and disasters.

*Philippines*: Country Outcome 3 – Reduced vulnerabilities among individuals and families and just and lasting peace achieved.


## Background

The Fall Armyworm (FAW) is an invasive pest that feeds on more than 80 plant species. Native to the Americas, the FAW was first detected in India in 2018 and has since spread to several countries in the Asia-Pacific region.

This project targeted five countries, Cambodia, Indonesia, Lao People's Democratic Republic, Nepal and Philippines, with the primary objective of curbing the spread of FAW in the region. It was designed to (i) improve awareness and knowledge of FAW; (ii) build capacity and capability of government officers in the affected areas to monitor FAW presence and status and manage FAW properly; and (iii) build the capacity of government officers in transferring knowledge, skills and control options suitable for farmers to reduce losses and prevent further spread.

## Impact

By strengthening the capacity of government and technical officers and farmers to effectively manage FAW in the targeted countries, the project results are expected to lead to improved food and nutrition security and reduced risks to human health and the environment.

## Achievement of results

The expected Outcome was achieved through the implementation of activities on increasing awareness and strengthening the capacity of government officers and farmers on FAW monitoring and management.

The expected Outputs were delivered to the greatest extent possible considering the coronavirus disease 2019 (COVID-19) pandemic restrictions. Through the implementation of workshops and Farmer Field Schools (FFSs), the project trained over 900 beneficiaries on FAW identification, technically sound and sustainable FAW management, including Integrated Pest Management (IPM) techniques, and the use of the Fall Armyworm Monitoring and Early Warning System (FAMEWS) app.

## Implementation of work plan and budget

One no-cost extension was requested and approved during project implementation. The planned activities were implemented within the allocated budget; however, the budget was adjusted as some activities could not take place owing to COVID 19 pandemic restrictions. The pandemic caused some delays in the implementation of activities in the field, especially FAW monitoring and the FFSs.

To mitigate the negative effects of the pandemic on activities, project staff regularly monitored progress and held review meetings with government partners and service providers, revising activities as necessary.

There were no environmental or social risks posed by the project.

## FOLLOW-UP FOR GOVERNMENT ATTENTION

Given the Indonesian geography, partnerships should be strengthened with Gadjah Mada University and other universities in the country, research centres, and private sector entities with the most appropriate technology for FAW management, to contribute to the project's sustainability.

The knowledge and capacity of some provincial and district facilitators and farmers were still limited at the time of reporting. They require support for 1-2 more seasons.

Continuous training and knowledge sharing are still necessary to ensure that facilitators trained on FAW identification, monitoring, early warning and sustainable management will be available in case of a staff restructuring.

Most of the targeted countries are still dependent on chemical pesticides. Further support for the production and application of biopesticides is important.

Project training materials and technical documents produced by the countries were found to be beneficial. They should be updated and shared with beneficiaries and stakeholders on a wider scale.

Cambodia's public and private sectors need to develop key interventions for resource mobilization based on the Standard Operating Procedure (SOP) and lessons learned and good practices from the strategy paper.

In Lao People's Democratic Republic, a policy for promoting biocontrol and IPM is lacking. A bottom-up approach based on participatory research and action should be used to raise awareness, to bring results to the attention of policymakers and to provide evidence for the formulation of this policy. The research should be conducted through field studies on biocontrol options for sustainable FAW management in season-long FFSs and short-term field-based farmer trainings on FAW identification and sustainable management.


Other challenges identified in Lao People's Democratic Republic included limited human resources; lack of roadmap, vision, and mission; lack of enabling environment for strengthening IPM; lack of a proactive work plan and budget; lack of multistakeholder collaboration; and limited coordination. The responsible staff at the IPM Unit should urgently bring these challenges to the attention of the Ministry of Agriculture and Forestry (MAF) through the management of the Plant Protection Centre (PPC) and the Department of Agriculture (DOA) for action. The PPC should assess its capacity needs to identify gaps for capacity development in order to fulfil its key functions. The PPC should also request that the DOA coordinate with the Department of Planning and Cooperation within MAF, which is responsible for the subsector working group on organizing a policy dialogue on key challenges for strengthening IPM.

## SUSTAINABILITY

### 1. Capacity development

Some recipient countries already have plans, policies, and legal frameworks that support the sustainability of project outcomes. The plan on integrated FAW management and technical assistance for extension officers in Indonesia is also based on lessons learned and experiences gained during implementation.

The SOP and strategy paper prepared by Cambodia will serve as legal frameworks for the country. The Government took ownership for the development of further approaches based on the SOP and strategy paper, and the implementation of further activities after project completion is expected.

The capacities that were strengthened and the systems that were introduced were being embedded in the recipient countries' organizational structures at the time of reporting. As a result, the project outcomes are likely to survive, as National Task Forces (NTFs), represented by government officials, are put into place in each of the targeted countries.

In Nepal, local-level technicians and farmers put in a considerable amount of work for the improvement of FAW identification, monitoring, surveillance, and sustainable management. They expressed hope that the sustainable management of FAW in maize crops will continue.

In Cambodia, the project was implemented in close collaboration with the Plant Protection Sanitary and Phytosanitary Department of the General Directorate of Agriculture and the Provincial Department of Agriculture, Forestry, and Fisheries in different provinces.

Indonesia implemented the activities under an LoA with Gadjah Mada University.

In Lao People's Democratic Republic, the collaboration of the PPC (DOA of MAF) with Lao Upland and Rural Advisory Service and Lao Farmer Network began to focus on researching farmer action for biocontrol and the development of communication materials on FAW management.

Collaboration between the National Plant Quarantine Program, Provincial Ministries and Plant Protection Laboratories for monitoring and biocontrol was strengthened to contribute to the project's sustainability in Nepal.

Project activities in Philippines were implemented under the FAO-Philippines FAW Action Plan, in which the Crop Pest Management Division of the Bureau of Plant Industry, Department of Agriculture Regional Field Office, the Regional Crop Pest Management Center, local governments, and FAO participated.

After project completion, Nepal considered it urgent to implement FAW management in all provinces by establishing a project for sustainable FAW management in maize.

Cambodia will endorse the SOP as guidance on procedures for FAW management.

For strengthening capacity on IPM implementation, Indonesia is researching environmentally friendly and sustainable FAW management techniques. They will move forward with some follow up actions, apart from explorations of IPM, based on local wisdom.

To ensure the continuation of project activities after completion, Nepal plans to do more training in other areas, using the model of FAW management and the related materials that were developed. In Cambodia, the SOP and strategy paper on FAW management in both English and local languages will be shared with concerned parties.

The project had a high level of national ownership and a strong exit strategy, owing to the fact that governments led and co-implemented project activities. The project aimed to empower the recipient countries so that they were able to carry out activities on their own after project completion. National and local officers with the capacity to identify, monitor and manage FAW actively participated in project implementation and shared their technical knowledge with farmers through FFSs. Trained officials and farmers were advised not only to collaborate with other projects but also to take initiative in the government budgeting process to continue the implementation of sustainable FAW management. The Plant Protection Center of Lao People's Democratic Republic is following up with a coordinator of the World Bank-funded Commercial Crop Production Project for possible collaboration.

At the time of reporting, continuous training was being planned for the recipient countries, and training materials/technical documents were to be reproduced and shared with stakeholders.

To shift from crop protection policies using chemical pesticides as a default option to IPM-oriented policies, policymakers need to recognize the achievements and benefits of IPM for the sustainable management of FAW. There are national bodies in the countries that are responsive to this, and most countries suggested further support for the production and use of biopesticides instead of chemical pesticides.

## 2. Gender equality

Women actively participated in all training sessions and workshops. Importantly, they were also involved in the FFS process. The overall percentage of participation of women in Indonesia, Nepal, and Lao People's Democratic Republic amounted to 40 percent, 45 percent, and 35 percent respectively.

Women were trained and benefited equitably from the project interventions. Not only did they participate in the training sessions, but they also served as key resources persons. The project contributed to the achievement of various objectives of the FAO Policy on Gender Equality, where women were involved in the decision-making process in the project's various activities.

## 3. Environmental sustainability

Throughout project implementation, emphasis was placed not only on environmentally friendly management practices such as IPM, but also on the production of bioagents to minimize chemical pesticide use. This remained mostly theoretical. The project identified environmentally friendly technology and control and promoted the use of these options in FAW management. In Cambodia, an FFS was established to demonstrate the effectiveness of biocontrol options in controlling FAW. To address the risks associated with the environment and human health, field-based farmer training in Lao People's Democratic Republic included a module on basic knowledge of pesticides and their effect on the environment and human health. At the end of the training, pesticide risk reduction was included in the community action plan for sustainable FAW management.


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### 4. Human Rights-based Approach (HRBA) – in particular Right to Food and Decent Work

The project promoted a participatory approach and encouraged transparency and human dignity. The targeted beneficiaries, farmers, and government partners were given opportunities to share ideas, opinions, and knowledge freely. Progress and results were shared regularly with partners at meetings.

The project improved economic returns for farmers, resulting in production sustainability, which, in turn, indirectly led to job creation. The project also contributed to the safety and health of small-scale farmers through the introduction of environmentally friendly technology for FAW management.

### 5. Technological sustainability

The technology introduced by the project was appropriate and flexible. The FAMEWS app was installed on tablets used by government officers for identifying and managing FAW, as well as monitoring damage.

Through the Training of Trainers (ToT) and field-based farmer training on identification and sustainable management of FAW, the project greatly contributed to the development of local knowledge, skills, capacity, resources and good practices. Technical officers at the national level provided local officers with further training on the FAMEWS app and field practices.

Most of the trained government officers and farmers could identify FAW and manage it successfully at the time of reporting. In Nepal, a loss assessment report showed a reduction of 7 percent compared to the prior year's loss. They can manage the pest in real time.

In Cambodia, the FAMEWS app is available in the local language. Staff in the field can continue FAW monitoring activities without further technical support.

### 6. Economic sustainability

In Philippines, government funds were used for project activities while other countries plan to allocate additional funds.

In Lao People's Democratic Republic, a budget proposal worth LAK 1 billion for FAW control was submitted to the government.

Funding for some activities on FAW control were also mentioned in Nepal for inclusion in the government's regular programme.


## Documents and outreach products

- **Plant Quarantine and Pesticide Management Centre (PQPMC).** 2020. *Curriculum for Pesticide entrepreneurs, agro-vets (retailers)/importers and traders' training on pesticide handling and FAW management*. Nepal.
- **PQPMC.** 2020. *Curriculum for Private Sector Engagement Training*. Nepal.
- **PQPMC.** 2020. *Curriculum for Training on Fall Armyworm identification and eco-friendly management for field-level technicians*. Nepal.
- **PQPMC.** 2020. *Guidelines format on Data Requirements for FAW infestation and loss report*. Nepal.
- **PQPMC.** 2020. *Leaflets/Flyers on FAW identification and management*. Nepal.
- **PQPMC.** 2020. *National Database of FAW report*. Nepal.
- **PQPMC.** 2020. *Pesticide Use Pattern/Pest Management Decision Guide (PMDG)*. Nepal.
- **PQPMC.** 2020. *Policy Review report*. Nepal.
- **PQPMC.** 2020. *Video on identification and management option of FAW*. Nepal.
- **PQPMC.** 2020-2021. *Training reports* (6 reports). Nepal.
- **PQPMC.** 2020-2021. *Yield loss assessment report*. Nepal.
- **General Directorate of Agriculture (GDA) and FAO.** 2021. *Poster on Fall Armyworm Life Cycle* (available in Khmer). Cambodia. 1 pp.
- **GDA and FAO.** 2021. *Poster on How can I identify Fall Armyworm* (available in Khmer). Cambodia. 1 pp.

- **GDA and FAO.** 2021. *Standard Operation Procedure (SOP) for FAW Management in Cambodia*. Cambodia. 14 pp.
- **GDA and FAO.** 2021. *Strategy Paper on the Fall Armyworm (Spodoptera frugiperda) Management in Cambodia*. Cambodia. 35 pp.
- **GDA and FAO.** 2021. *Leaflet on Fall Armyworm Management Decision Guide Green and Yellow list* (Available in Khmer). Cambodia. 1 pp.
- **Ministry of Agriculture and Forestry.** 2021. *Poster on rearing and field releasing of stink bugs by Plant Protection Centre*. Lao People's Democratic Republic. Vientiane.
- **PQPMC.** 2021. *Biological and ecological study of FAW report*. Nepal.
- **PQPMC.** 2021. *Curriculum for Fall Armyworm monitoring and early warning system (FAMEWS) Training*. Nepal.

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- **PQPMC.** 2021. *Curriculum for FFS ToT of IPM/FFS*. Nepal.
- **PQPMC.** 2021. *Curriculum for Laboratory Training on Mass Production and Release of Egg Parasitoid (Trichogramma chilonis)*. Nepal.
- **PQPMC.** 2021. *Curriculum for Training of Trainers (ToT) on IPM/FFS Facilitator on Fall Armyworm Management*. Nepal.
- **PQPMC.** 2021. *IPM/FFS Report*. Nepal.
- **PQPMC.** 2021. *Manual of IPM/FFS* (in English and Nepali). Nepal.
- **Zakaria, F.** 2021. *FAW Handbook* (in the Indonesian language). Jakarta. 61 pp.

## Achievement of Results - Logical Framework

| | | |
|---|---|---|
| **Expected Impact** | **Improved food and nutrition security while reducing risks for human health and environment** | |
| **Outcome** | Strengthened capacity and capability of the technical officers, extension officers and farmers in managing FAW through proper identification, monitoring and control using affordable technologies to reduce farm losses and contain further spreading | |
| | Indicator | - Number of training technical officers and extension officers.<br>- Distribution of FAW in the affected areas mapped and severity of the damage recorded.<br>- Reduction in the damage of FAW infested areas through affordable technologies for small farmers. |
| | Baseline | - Initial reports, with first occurrences of FAW, often state that there is around 40-70 percent damage done by FAW.<br>- No standardized unit of measurement of FAW damage exists. |
| | End Target | - Indicative target indicator, to be further refined during project implementation: Damage of FAW is reduced to less than 10 percent in the areas that use sound FAW management options.<br>- The spread and incidence of FAW is monitored and basis for appropriate interventions, thereby reducing damage by FAW in target crops from initial high population levels at first incidence to acceptable level of control. |
| | Comments and follow-up action to be taken | The project significantly strengthened the capacity and capability of government officers and farmers for proper FAW identification, monitoring, and control. Over 900 technical staff and farmers participated in awareness-raising and capacity-development activities. Technical and informational materials were disseminated for the further implementation of FAW control measures. The project developed the capacity of technicians on better pest monitoring by using the FAMEWS app, and IPM facilitators conducted FFSs on FAW management in maize. Government officers provided farmers with recommendations on FAW management based on IPM concepts. The following were suggested: (i) the formation of national responding bodies; (ii) the translation of the FAMEWS app into local languages; (iii) follow-up on the community action plans on sustainable FAW management, soil improvement, and pesticide use and risk reduction in the participating communities; and (iv) the institutionalization and further implementation of FAW management activities. |

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| **Output 1** | Increased awareness on FAW and strengthened capacity and capability of the technical officers and extension officers for proper recognition of FAW and technically sound and sustainable FAW management | | |
| | Indicators | Target | Achieved |
| | Number of training technical officers and extension officers. | 80 technical officers and extension officer (20 officers per country) trained. | Partially |
| **Baseline** | Zero officers have been trained. | | |
| **Comments** | Over 150 technical and extension officers could identify FAW after the training was implemented. Their capacity and capability in FAW scouting, monitoring, identification and management were strengthened. The project consultant collected information and scientific documents on FAW biology and ecology to be used as reference materials. He also developed curriculums for training activities. Workshops, ToT sessions, and FFSs on the biology and ecology of FAW, biological control, and sustainable management strategies were organized in the participating countries. Due to COVID-19 restrictions, some activities were conducted virtually. | | |

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| **Activity 1.1** | Collate suitable information on FAW worldwide and also conduct study on the biology and ecology in the recipient countries, and developing communication materials | |
| | Achieved | Partially |
| | Comments | The project collated information and scientific documents on the biology and ecology, corn variety, damage level, and presence of FAW at different stages of its life cycle. Communication materials, including posters and leaflets on the life cycle and identification of FAW and pest management guides were published in local languages and disseminated to farmers. A short video for FAW identification and management was also developed and broadcast on TV. |
| **Activity 1.2** | Conduct a regional training workshop on the biology and ecology of FAW, and best management options, including biocontrol approaches | |
| | Achieved | Partially |
| | Comments | Due to the impacts of the COVID-19 pandemic and the resulting mobility restrictions, the regional training workshop was conducted virtually. It was coordinated by the Lead Technical Officer (LTO) of the project, and experts trained participants on FAMEWS, biology, biocontrol, and management in different periods in different countries. |

<table>
<tr><td rowspan="3">Activity 1.3</td><td colspan="4">Conduct FAW awareness programme in the respective recipient countries</td></tr>
<tr><td>Achieved</td><td colspan="3">Yes</td></tr>
<tr><td>Comments</td><td colspan="3">The planned FAW-awareness programmes were successfully implemented. Over 700 participants, including farmers, pest observers, extension workers, and representatives from agriculture knowledge centres, plant protection laboratories, and the private sector participated in FAW-awareness training activities. The training sessions focused on IPM and biocontrol agents, as well as good practices on maize crop production and protection. A workshop was held on the development of FAW communication and awareness-raising materials to be translated into local languages and disseminated through mass outreach campaigns by government officers and farmers.</td></tr>
<tr><td rowspan="3">Output 2</td><td colspan="4">Strengthening the monitoring capacity on the status of FAW in the recipient countries based on international standard for pest management and pest reporting, and introducing FAMEWS where appropriate and relevant as a monitoring tool</td></tr>
<tr><td colspan="2">Indicators</td><td>Target</td><td>Achieved</td></tr>
<tr><td colspan="2">Distribution of FAW in the affected areas mapped and severity of the damage recorded.</td><td>Minimum 2 monitoring survey will be conducted based on international standard.</td><td>Yes</td></tr>
<tr><td>Baseline</td><td colspan="4">No proper record on the status have been conducted.</td></tr>
<tr><td>Comments</td><td colspan="4">Training for technical officers was held to strengthen their capacity to monitor FAW and their capacity to use the FAMEWS app.<br>In Philippines, the training curriculum covered the preparation of a pilot regional and provincial FAW monitoring system while strengthening the management of surveillance information systems for pest reporting. After the training, farm-level FAW surveillance teams were tasked with conducting monthly surveillance and monitoring surveys based on FAW survey protocol and procedures, and the FAW pest map was developed.<br>Cambodia used FAMEWS translated into the local language for conducting FAW monitoring. Maize crops were monitored for two seasons in seven provinces.<br>Although Nepal also established a survey team, the monitoring could not be conducted due to COVID-19 restrictions. However, the training on biology and management was conducted.<br>Similarly, the FAMEWS application and biological control topics were largely covered in Lao People’s Democratic Republic. Government officials suggested the current version of FAMEWS, which is in English, is difficult to use. It is recommended that it be translated into the local language, which has been communicated by the LTO to headquarters.</td></tr>
<tr><td rowspan="3">Activity 2.1</td><td colspan="4">Regional workshop on preparation and operationalization of the monitoring system of FAW in the affected provinces and districts of the recipient countries</td></tr>
<tr><td>Achieved</td><td colspan="3">Partially</td></tr>
<tr><td>Comments</td><td colspan="3">The recipient countries conducted training on the preparation and operationalization of the FAW monitoring system. FAO resource persons, along with government experts, conducted virtual training on the FAW monitoring system, using the FAMEWS app to strengthen information system management and reporting for Cambodia, Indonesia, Lao People’s Democratic Republic, and Nepal. Nepal conducted training in two places for 18 field-level technicians. Philippines also organized training with a focus on field scouting, light trapping, and pheromone lure application. Biological control training in the regional laboratory was also carried out in Nepal. As reported by the team there, it was not possible to hold an in-person regional workshop due to COVID-19 restrictions.</td></tr>
<tr><td rowspan="3">Activity 2.2</td><td colspan="4">National survey team conduct the monitoring survey in selected farms based on the FAW survey protocol and procedure</td></tr>
<tr><td>Achieved</td><td colspan="3">Yes</td></tr>
<tr><td>Comments</td><td colspan="3">The recipient countries established their respective national survey teams, prepared surveillance protocols, and procured and distributed surveillance materials for monitoring FAW. In Philippines, the survey team conducted monthly surveillance and monitoring surveys. A pilot study on monitoring the population of FAW using FAMEWS was organized in one of the maize planting areas in Indonesia. Nepal was unable to conduct the monitoring survey due to the COVID-19-related mobility restrictions. As FAMEWS was not available in the local language, a physical survey was conducted in Lao People’s Democratic Republic.</td></tr>
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<tr><td rowspan="3">Activity 2.3</td><td colspan="3">Regional sharing of survey results for synchronized FAW management with specific control approaches</td></tr>
<tr><td>Achieved</td><td colspan="2">Partially</td></tr>
<tr><td>Comments</td><td colspan="2">The Department of Agriculture's regional field office in Philippines maintained and updated a regional FAW pest map based on FAW pest incidence reports. These pest maps included the status of FAW infestations, the crops and areas affected, degree of damage, as well as the control options that were applied. Based on the analysis of the FAW pest maps, the regional field office issued FAW pest forecasts and early warnings as a guide for farmers and local government units. The data collected by FAMEWS was automatically sent to FAO and made available to all parties concerned.</td></tr>
<tr><td rowspan="3">Output 3</td><td colspan="3">Management of FAW in selected infested areas to demonstrate that the pest damage and incidence reduce to below economic threshold levels.</td></tr>
<tr><td>Indicators</td><td>Target</td><td>Achieved</td></tr>
<tr><td>Reduction in the damage of FAW infested areas through affordable technologies for small farmers.</td><td>Improved knowledge on FAW and cheap, sustainable and simple technologies introduced to small farmers.</td><td>Partially</td></tr>
<tr><td>Baseline</td><td colspan="3">No control technologies package available for small farmers.</td></tr>
<tr><td>Comments</td><td colspan="3">The project built the capacity of IPM facilitators for conducting IPM FFSs on FAW in maize. Cambodia and Nepal organized three and four IPM FFSs for sustainable FAW management, respectively, led by the trained facilitators. Philippines organized a workshop on the development of a season-long FFS guide to FAW IPM and refresher training for FAW IPM FFS facilitators on sustainable FAW management. The country also organized five season-long pilot FFSs on FAW IPM. The pilot FFSs were designed to: (i) validate the field guide for FFS on FAW IPM; (ii) demonstrate the effectiveness of IPM options in sustainable FAW management; and (iii) introduce biopesticides/biocontrol options (including local production) to minimize pesticide dependency and its adverse effects on human health and the environment. It was suggested that the provision of quality farmer education through season-long FFSs place emphasis on participatory technology development activities, given the unfamiliarity of farmers with FAW biology and ecology.</td></tr>
<tr><td rowspan="3">Activity 3.1</td><td colspan="3">Developing FAW integrated pest management utilizing cheap, affordable and sustainable control measures</td></tr>
<tr><td>Achieved</td><td colspan="2">Yes</td></tr>
<tr><td>Comments</td><td colspan="2">The project developed FAW IPM in the recipient countries. The FFSs on FAW IPM were conducted to increase farmers' knowledge on the role of natural enemies, the use of biocontrol for FAW management, and field monitoring and agroecosystem analysis. Nepal reviewed the national IPM protocol and developed an IPM FFS manual in the local language for the implementation of FAW IPM.</td></tr>
<tr><td rowspan="3">Activity 3.2</td><td colspan="3">Demonstrating and documenting integrated pest management of FAW in selected farms</td></tr>
<tr><td>Achieved</td><td colspan="2">Partially</td></tr>
<tr><td>Comments</td><td colspan="2">The FFSs were designed to include physical, pheromonal, biological, and chemical measures, and they were organized to introduce IPM for FAW control in the recipient counties. Cambodia, Nepal, and Philippines conducted three, four, and five IPM FFSs respectively for maize in selected provinces. The results of the yield loss assessment in Nepal were 16.51 percent and 9.86 percent losses in 2020 and 2021, respectively. The COVID-19 restrictions caused some delays in implementation, and Lao People's Democratic Republic had difficulties with the implementation of the FFSs due to COVID-19 outbreaks in the targeted communities.</td></tr>
<tr><td rowspan="3">Activity 3.3</td><td colspan="3">Introduction of bio-pesticides/biocontrol options to reduce effect on human health and environment</td></tr>
<tr><td>Achieved</td><td colspan="2">Yes</td></tr>
<tr><td>Comments</td><td colspan="2">Activities to introduce biopesticides and biocontrol were organized in the recipient countries. The curriculums of the ToT and FFSs included knowledge of biopesticides and biocontrol options for sustainable FAW management. In the IPM demonstration plots, the selected biocontrol agent was applied to reduce pesticide effects on human health and the environment in Cambodia. Lao People's Democratic Republic, Nepal, and Philippines conducted training on biopesticides and biocontrol options, including rearing and mass production of biocontrol agents, and their application in the field.</td></tr>
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**Partnerships and Outreach**
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