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EMERGENCY RESPONSE TO ENHANCE THE NATIONAL CAPACITY OF EGYPT FOR EARLY WARNING, MONITORING AND MANAGEMENT OF FALL ARMYWORM

March 2022

SDGs:



Country:

Egypt

Project Code:

TCP/EGY/3706

FAO Contribution:

USD 350 000

Duration:

1 January 2020 – 31 December 2021

Contact Info:

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Implementing Partners

Ministry of Agriculture and Land Reclamation (MALR).

Beneficiaries

The MALR; extension specialists; pest control specialists; researchers; agriculture directorates; sugarcane factories; Rice Research and Training Centre; participants in Farmer Field Schools; laboratories specializing in the propagation and release of the natural enemies of Fall Armyworm (FAW); and smallholder farmers.

Country Programming Framework (CPF) Outputs

Output 1.5: Surveillance, control and early warning of trans boundary animal diseases and zoonoses, plant pests, and fish diseases strengthened.



BACKGROUND

Native to tropical and subtropical regions of the Americas, the Fall Armyworm (FAW) is a transboundary pest that travels great distances very quickly and feeds on a variety of crops, including maize, rice, sorghum and sugar cane.

The FAW was detected in West Africa for the first time in 2016, and within a few years, it had spread to almost all the countries in sub-Saharan Africa. Its presence was first reported in maize fields in Egypt in May 2019.

Owing to the speed with which it spreads and the fact that it can feed on so many different plants, the FAW has the potential to devastate yields and damage crops in Egypt, thereby dramatically affecting food security and threatening the livelihoods of smallholder farmers.

This project was designed to build the capacities of a variety of stakeholders, including staff of the Ministry of Agriculture and Land Reclamation (MALR) and smallholder farmers, to identify, monitor and control the spread of FAW in Egypt through awareness-raising, training programmes, the implementation of Integrated Pest Management (IPM) strategies and the provision of equipment.

IMPACT

The results of the project are expected to contribute to the protection of livelihoods and food security of smallholders, including women and youth, who are living in FAW-affected areas in Egypt through the development of capacities on awareness, surveillance, monitoring and IPM of the FAW.

ACHIEVEMENT OF RESULTS

Significant contributions towards the control of the FAW in Egypt were made under this project, which supported Country Programming Framework (CPF) Output 1.5 (Surveillance, control, and early warning of transboundary animal diseases and zoonoses, plant pests, and fish diseases strengthened).

The project succeeded in raising awareness among stakeholders, building capacities for the mass production of biopesticides for FAW control and establishing Farmer Field Schools (FFSs) for infested maize crops.

The project's three Outputs were delivered. Through two inception workshops, project partners were identified, and focal points and their roles were established. Training programmes were carried out in both infested and non-infested governorates for 905 participants. Roughly 25 000 awareness raising items (such as posters and leaflets) were disseminated.

The FFSs were established at three locations in two governorates, and a Training of Facilitators (TOFs) session was held in Minya in June 2021. Without the need for an expert or specialist, the FFSs allowed for farmers to acquire knowledge and experience in implementing and evaluating IPM practices for the control of FAW.

The project supported the MALR in setting up a national FAW network and an efficient monitoring and early warning system. Monitoring focused mainly on maize planting areas but took other host crops into consideration as well. Data was collected with the Fall Armyworm Monitoring and Early Warning System (FAMEWS) application in different governorates, and the data received from 26 surveyors in 17 uninfected governorates were reviewed, validated, and submitted on PlantVillage, the global platform for the FAMEWS app.

Actions were taken for FAW management, including the biological control and conservation of natural enemies. This was made possible by improving the infrastructure and raising the holding capacities for the production of natural enemies in the biocontrol unit of the Plant Protection Research Institute at Dokki, Giza and in the Shandaweel Research Station in Sohag.

Different field surveys showed the presence of the parasitoid *Telenomus remus*, which has proved to be effective against FAW in other infested countries. *T. remus* was identified by the Insect Classification and Surveying Department of the Plant Protection Research Institute of the Agricultural Research Center (ARC). At the time of reporting, the parasitoid was being propagated for release in Egyptian fields for the potential control of FAW.

IMPLEMENTATION OF WORK PLAN AND BUDGET

Two no-cost extensions were requested and granted during the project's life cycle. Both extensions were requested in order to accommodate for the restrictions brought about by the coronavirus disease 2019 (COVID-19) pandemic, which proved to be a risk to implementation. Because of the restrictions, some activities and training sessions were postponed, and others were carried out virtually. The allotted budget was sufficient for the implementation of activities and the procurement of equipment for two bio-laboratories of the MALR.

There was an issue with the number of pheromone traps distributed by the MALR; however, 2 500 traps were eventually distributed.

The total number of FFSs established did not reach the set target, so it has been suggested that the model be expanded into other governorates for other crops.

There were some technical issues that occurred when uploading data from the FAMEWS app onto the global platform. These issues were partially resolved at FAO headquarters.

FOLLOW-UP FOR GOVERNMENT ATTENTION

Continued financial support to the MALR is recommended to ensure that the FFS model is replicated in other FAW-infested areas, to disseminate IPM practices and to support the production of biopesticides and the propagation and release of natural enemies. The FAW management measures utilized should be evaluated regularly.

The MALR should distribute more pheromone traps and ensure that data is being collected through the FAMEWS app to maximize the benefits of monitoring and early warning.

More smart phones equipped with the FAMEWS app should be procured and distributed, and additional data should be collected with the app.

A large-scale awareness-raising campaign on FAW should be carried out by the media.



SUSTAINABILITY

1. Capacity development

The project closely collaborated with the MALR and covered different crops, such as maize, rice, sugarcane and sugar beets. Project partners included extension specialists, pest control specialists, researchers, agriculture directorates, and the Rice Research and Training Centre.

The enhanced capacity of all stakeholders on the mass production of biopesticides and the rearing of natural enemies found in Egyptian fields is expected to contribute to FAW control.

All activities were managed and supervised by FAO. National consultants designated by FAO supervised the activities implemented by MALR. Through back-to-office reports (BTORs), meeting minutes and terminal reports, FAO followed up on the implementation of all activities as requested by MALR. The budget and procurement were managed by FAO.

2. Gender equality

The participation of women was encouraged in all meetings, workshops, training programmes and other activities.

Women and men benefited equitably from the results achieved. The project contributed to the protection of livelihoods and food security of smallholders, including women and youth, who are living in FAW-affected areas, and it developed the capacities of stakeholders on awareness, surveillance, monitoring and IPM of the FAW.

3. Environmental sustainability

An environmentally friendly approach was recommended for controlling the spread of FAW in Egypt. The project encouraged and promoted the mass production of biopesticides and the conservation of FAW's natural enemies by enhancing the infrastructure of related laboratories and carrying out training programmes on these topics. A laboratory for mass rearing of the natural enemies of FAW was inaugurated in Shandaweel village. This laboratory is the first of its kind in Egypt.



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

The HRBA was applied in all project activities.

5. Technological sustainability

Appropriate and flexible instruments, equipment, and other facilities were procured and delivered to MALR for enhancing the capacities of bio-laboratories in Dokki, Giza and Shandaweel, Sohag, which will play a key role in the sustainability of FAW management. These tools will be used to sustain biopesticide production, to propagate natural enemies and to facilitate their release into FAW-infested fields. In addition, mobile phones with the FAMEWS application will be used to sustain the monitoring and early warning system for FAW in Egypt. The sustainability of project outcomes will also be promoted by the Global Action for Fall Armyworm Control under the framework of a project entitled *Scaling-up the sustainable management of the Fall Armyworm in Africa, the Near East and Asia*. Under this project, the IPM strategy will be implemented to sustain the management of FAW in Egypt in cooperation with MALR.



6. Economic sustainability

The project aimed to contribute to minimizing the impact of FAW and to control FAW infestation by strengthening monitoring and IPM capacities at all levels. The FFSS targeting small scale farmers, as well as the release of natural enemies in the infested fields, are expected to contribute to reducing crop yield losses, therefore minimizing the negative economic impacts of FAW, especially on maize crops.



DOCUMENTS AND OUTREACH PRODUCTS

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Fall Armyworm Committee, FAO & MALR. 2020. Fall Armyworm Guide in Egypt. Cairo. 19 pp.

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منظمة الاغذية والزراعة (٢٠٢٠) نشرة إرشادية عن استخدام تطبيق الفيوموس في المراقبة والانداز المبكر لدودة الحشد الخريفية. القاهرة – مصر: ٢ صفحة.

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منظمة الاغذية والزراعة (٢٠٢٠) نشرة إرشادية عن الفحص الحقلى لدودة الحشد الخريفية. القاهرة – مصر: ٢ صفحة.

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منظمة الاغذية والزراعة (٢٠٢٠) نشرة إرشادية عن الأعداء الحيوية لدودة الحشد الخريفية في حقول الذرة الشامية. القاهرة – مصر: ٤ صفحة.

FAO. 2020. The Natural Enemies of Fall Armyworm in Maize Fields (in Arabic). Cairo. 4 pp.

ACHIEVEMENT OF RESULTS - LOGICAL FRAMEWORK

Expected Impact	Protect livelihoods and food security of smallholders in FAW-affected areas in Egypt		
Outcome	Minimize the impact of FAW infestation and strengthening FAW monitoring and integrated management capacities of all stakeholders		
	Indicator	<ul style="list-style-type: none"> – Number of governorates with operational FAW surveillance system and management mechanisms. – Number of protected smallholders against FAW. – Number of FAW affected areas in Egypt with operational management system. 	
	Baseline	<ul style="list-style-type: none"> – 0 – 0 – Three FAW infested governorates (Aswan, Luxor and Qena) in upper Egypt 	
	End Target	<ul style="list-style-type: none"> – All 27 Egyptian governorates. – 1 000 smallholders at FAW infested and non-infested governorates – All FAW affected governorates in Egypt 	
	Comments and follow-up action to be taken	Fully achieved. All Egyptian governorates, with both infested and non-infested areas, were included in the management strategies implemented within the project framework. The FAW management strategy mainly focused on smallholders in all Egyptian governorates. A total of 905 stakeholders benefited from all implemented activities. All FAW-affected areas in Egypt were included in the operational management system. During the implementation of the project activities to manage FAW spread, the FAW-infested areas gradually increased under natural environmental conditions in Egypt. Therefore, it is recommended that financial support to the MALR be continued to ensure the sustainability of the FFSs to increase the production of natural enemies and biopesticides, as well as to implement different agricultural practices and other relevant IPM strategies in Egypt. The tolerance of different local varieties of the main hosts for FAW should be evaluated, and the adoption of the FAMEWS application in monitoring FAW should be implemented.	
Output 1	Increased awareness among all stakeholders (farmers/extension specialists/pest control specialists/researchers/agriculture directorates/agriculture investors/private sector/NGOs etc.) on FAW infestation in Egypt		
	Indicators	Target	Achieved
	<ul style="list-style-type: none"> – Number of inception workshop participants disaggregated by gender. – Number of awareness raising material disseminated. 	<ul style="list-style-type: none"> – 40 male and female participants sensitized during inception workshops. – Awareness raising material. – 1 000 copies of guidelines on FAW scouting and monitoring, FAMEWS app, and management options. – 1 000 copies of brochures to be delivered to farmers produced and disseminated (including FAO FAW FFS guide in Arabic and on the risk of using pesticides). 	Yes
Baseline	<ul style="list-style-type: none"> – 0 – 0 		
Comments	The awareness of 905 stakeholders was enhanced through 40 different awareness-raising and training programmes implemented in 20 infested and non-infested governorates and supervised by two national FAO consultants. Awareness-raising materials (about 25 000 copies of posters, leaflets and videos) were disseminated to different stakeholders. In addition, FFSs were established under the supervision of FAO consultants to serve as models in three locations in two governorates. The FFSs focused on maize crops in the regions of Dakhla and Kharga in the New Valley, as well as in the village of Dandara in Qena, with a total of 69 participants. The FFSs specialized in transferring experiences between farmers. Due to their success, the FFSs could be considered as models in the application of IPM of FAW to be disseminated in all FAW-infested regions.		
Activity 1.1	Identify the project partners (farmers, extension specialists, pest control specialist, researcher, agriculture directorates, sugarcane factories, Rice Research and Training Centre, NGOs and stakeholders), focal points in each governorate and their role in completing the project activities		
	Achieved	Yes	
	Comments	Farmers, extension specialists, pest control specialists, researchers, agriculture directorates, sugarcane factories, the Rice Research and Training Centre, NGOs and other stakeholders were identified as project partners, and focal points and their roles were clarified. The role of women was greatly appreciated during the training sessions and awareness-raising programme. A total of 167 women participated in different activities.	

Activity 1.2	Conduct two inception workshops to discuss the scope and objectives of the project, present the proposed work plan and designating the responsibilities of each stakeholder	
	Achieved	Yes
Activity 1.3	Comments	Two inception workshops were conducted in Luxor from 2-3 February 2020 for 40 male and female participants to discuss the scope and objectives of the project and the proposed work plan and to designate the responsibilities of each stakeholder. The government partially committed to upscaling and regular use of the FAMEWS application in FAW monitoring and early warning.
	Prepare, produce and disseminate communication materials (posters, leaflets, videos, etc.) followed by initiating awareness raising campaigns through local media coverage on the dangers/damages posed by the FAW	
Activity 1.4	Achieved	Yes
	Comments	About 2 000 leaflets, 500 posters and five videos were disseminated to different stakeholders during training programmes. This included guidelines on FAW scouting and monitoring in Arabic, as well as materials on the FAMEWS app and management options. Communication materials released by FAO enhanced awareness of the dangers of and damage done by FAW and the potentially effective IPM strategy. Information from the implemented activities was disseminated through the meeting of the National Focal Points (NFPs) for the Near East and North Africa (NENA) region, which supported the planning and implementation of the Global Action for FAW Control. It is recommended that the media become more involved in raising awareness for FAW management.
Activity 1.5	Translate, print and disseminate FAO-FAW FFS Guide in Arabic	
	Achieved	Yes
Activity 1.5	Comments	The FAO FAW FFS guide was translated into Arabic and disseminated to the stakeholders in the established FFSs. The FFS model should be implemented in all FAW-infested governorates, and the model should incorporate other host crops besides maize.
	Develop awareness raising materials on the risk of using hazardous pesticides in management of FAW	
Activity 1.5	Achieved	Yes
	Comments	Awareness-raising materials on the risk of using hazardous pesticides for FAW management were developed. The safe use of biopesticides was also recommended through the training programmes, during the FFS graduation ceremony and at the inauguration of a bio-lab specific for the mass rearing of natural enemies of the FAW in Sohag.

Output 2	Supporting the ministry of Agriculture and Land Reclamation in setting up a national FAW network and an efficient monitoring and early warning plan		
	Indicators	Target	Achieved
	<ul style="list-style-type: none"> – Number of (a) Pheromone traps/lures/ insecticidal strips, (b) bio-pesticides, spraying tools, PPE and other tools procured and delivered. – Number of smart phones with FAMEWS application installed procured and delivered. – Number of people trained disaggregated by gender. – Number of FFS established and operational. 	<ul style="list-style-type: none"> – 15 000 Pheromone lures and 4 500 traps. – 7 500 litre bio-pesticides, spraying tools, PPE, materials for biopesticides production, production and distribution of natural enemies. – 100 smart phones with FAMEWS application. – At least 80 male and female members/stakeholders trained on FAW, monitoring tools, and FAW sustainable management options. – Training of data management specialists on data reviewing and validation for FAMEWS data and FAMEWS global platform. – 25 male and female agriculture extension specialists receive FFS facilitator training. – At least 1 000 male and female farmers benefitted from FFSs focusing on IPM of FAW. 	Yes
Baseline	<ul style="list-style-type: none"> – 0 – 0 – 0 – 0 		
Comments	<p>The project supported the MALR in setting up a national FAW network and an efficient monitoring and early warning system in Egypt. Monitoring focused mainly on maize planting areas but also considered other potential key hosts. Two training programmes targeting FAW specialists and surveyors (55 master trainers from the Central Administration of Plant Quarantine and the Central Administration for Pest Control) and 650 farmers were implemented in different governorates on how to use pheromone traps and the FAMEWS application. A national review system for this data was established under the supervision of MALR.</p> <p>Five field missions for collecting data using the FAMEWS app were conducted in different governorates. All data received from the 17 uninfected governorates of 26 surveyors were reviewed, validated, and submitted. The biological control laboratories at MALR were supplied with different instruments, tools, and equipment.</p>		
Activity 2.1	Conduct training workshops for all stakeholders at different regions on FAW trapping/field scouting/how to use FAMEWS application for collecting data from the field		
	Achieved	Yes	
	Comments	<p>Intensive awareness and training programmes were implemented in Minya, Aswan, Luxor, Sohag, Ismailia, Menofia, Kafr El-Shiekh (maize farmers), Alexandria, El-Beheira, Qena, New Valley, Al Qualyubia, Giza, Faiyum, Sharqia, Mansoura and Kafr El-Shiekh (rice farmers), Gharbia, Beni Suif, and Asyut. The average number of participants in each training session was 27, with five on average being female.</p> <p>The awareness-raising programme included different sectors at MALR and covered maize, rice, sugarcane and sugar beets. Eight training programmes were delivered to agricultural specialists at sugarcane and sugar beet factories.</p> <p>The goals of these programmes were: (i) capacity building on FAW management and IPM control actions; (ii) raising awareness on pest damage and a sustainable control strategy; (iii) clarifying the role of FAO activities for enhancing sustainable control measures of FAW; (iv) support to field activities using the FAMEWS application; and (v) the practical aspects of implementing an IPM strategy.</p> <p>The agenda of each training day included theoretical awareness-raising sessions followed by field visits to train participants on how to use pheromone traps and the FAMEWS application.</p> <p>An innovative survey to measure knowledge delivery was conducted, using remote devices and a voting program called OMBEA. In order to assess the knowledge level of participants, prepared multiple-choice questions were given at the beginning of the day. The participants were requested to answer the questions by voting using OMBEA. The same questions were asked at the end of the session to assess the efficiency of the training. Based on participant feedback, the training session was extended, and additional materials were provided when required.</p> <p>WhatsApp groups for each training mission were created to share and exchange information about FAW and the acquired experiences about pest management.</p> <p>Training programmes (virtual and physical) targeting FAW specialists and surveyors (55 master trainers and 650 farmers) were implemented in different governorates on how to use pheromone traps and the impact of the FAMEWS application for monitoring and early warning of FAW in the field. A training programme focusing on data review and validation for FAMEWS data and the FAMEWS global platform was implemented for data management specialists (five data reviewers).</p> <p>Finally, an evaluation for the training programme was performed by gathering stakeholder feedback.</p>	

Activity 2.2	Procurement and delivery of FAW Pheromone traps/and refill kits (Lures and killing strips)	
	Achieved	Yes
	Comments	A total of 2 500 traps and 15 500 pheromone lures (P061), 15 500 insecticidal strips, and 60 smart phones containing the FAMEWS application were procured and delivered to MALR.
Activity 2.3	Procurement and delivery of bio-pesticides (Neem, Bt, etc)/spraying tools and PPE	
	Achieved	Yes
	Comments	Twelve sprayers, valved reusable half-face respirators and disposable coveralls (type 5/6 to protect from pesticide splashes) were procured and delivered to MALR. Bio-pesticides had already been procured by the Ministry, so that part of the activity was cancelled.
Activity 2.4	Procure and deliver tools and equipment required for natural enemies production, release and preserve	
	Achieved	Yes
	Comments	Five air conditioners, two incubators for insect breeding, one biological safety cabinet used for bioagent inoculum preparation, two autoclaves for media preparation and equipment sterilization, three digital sensitive balances, two overhead rotor mixers, two binocular optical microscopes, two desktop computers with monitors, 60-insect rearing boxes, measuring cylinders, beakers and glass pipettes were procured and delivered to the laboratories at MALR.
Activity 2.5	Procure and deliver smart phones with FAMEWS	
	Achieved	Partially
	Comments	A total of 60 smart phones loaded with the FAMEWS application were delivered. The originally targeted number was 100; however, the COVID-19 pandemic caused purchasing delays. Additional smart phones with the FAMEWS application should be provided to MALR.
Activity 2.6	Training of IT and data management specialists on data reviewing and validation for FAMEWS data and FAMEWS global platform	
	Achieved	Yes
	Comments	A training programme focusing on FAMEWS data review and validation and the FAMEWS global platform was implemented for five data management specialists.
Activity 2.7	Support field missions for collecting data from different governorates	
	Achieved	Partially
	Comments	A limited number of field missions for collecting data using the FAMEWS application were conducted in different governorates, owing to a shortage in the number of surveyors at MALR, as well as some technical issues with the application. Additional field missions of this nature should be implemented.
Activity 2.8	ToT for FFS facilitators on how to implement and run FFSs in relation to FAW	
	Achieved	Yes
	Comments	A Training of Facilitators (TOFs) was conducted in Minya in June 2021 for 21 participants who were selected out of 25 nominees. This training focused on key concepts of FFSs and assisted participants in understanding how to plan, manage, evaluate, and monitor FFSs.
Activity 2.9	Implementation of FFSs focusing IPM/FAW	
	Achieved	Yes
	Comments	The establishment of FFSs allowed for on-the-job training to be technically supervised by FAO consultants. This enhanced implementation and ensured that the schools fulfilled farmer needs and supported their decisions. Originally, 1 000 male and female farmers were targeted for the FFSs; however, fewer beneficiaries were reached owing to the COVID-19 pandemic and the limited area of maize cultivation. The FFSs focused primarily on maize and on transferring experiences among the farmers so that they could find sustainable FAW control solutions. This was done through a series of awareness-raising activities carried out by FAO in cooperation with the various authorities of the MALR, in which farmers acquired knowledge and experience on the implementation of agricultural practices to see results in the field without the need for an expert or specialist. Graduation ceremonies were organized for these schools during the maize season. The application of the IPM approach to FAW was circulated in the regions and governorates with the highest incidences of FAW infestation, in cooperation with MALR.

Develop and implement actions for FAW management in Egypt			
	Indicators	Target	Achieved
Output 3	<ul style="list-style-type: none"> – Survey report on identifying the potential biological agents and opportunities. – Number of individuals trained disaggregated by gender on the production of bio-pesticides. – Number of individuals trained on natural enemies rearing and release. – Reports on the evaluation of local FAW management options and adoption of FAMEWS application in data management. 	<ul style="list-style-type: none"> – Three months survey to identify the potential biological agents and opportunities conducted and report produced. – 40 male and female individuals trained on the production of bio pesticides and natural enemies production, release and preservation. – Ten specialists and researchers trained on natural enemies rearing and release. – Two evaluation reports on the local FAW management options, efficiency of bio pesticides produced, and adoption of FAMEWS application in monitoring FAW. 	Yes
Baseline	<ul style="list-style-type: none"> – 0 – 0 – 0 – 0 		
Comments	<p>Training programmes on the rearing and release of natural enemies as well as biopesticide production were implemented.</p> <p>A survey targeting natural enemies was carried out in six locations in Qena and Sohag governorates. Different field surveys showed the presence of the parasitoid <i>Telenomus remus</i> in Egyptian fields. It was identified by the Insect Classification and Surveying Department of the Plant Protection Research Institute's ARC. The parasitoid was propagated for release into Egyptian fields for the potential control of FAW.</p> <p>Other natural enemies, including spiders, were found, as were other unknown species which may be successful for FAW control.</p> <p>The production of biological enemies by both the public and private sectors should be upscaled to prevent the use of hazardous pesticides that harm the natural ecological balance.</p>		
Activity 3.1	Conduct a survey to identify the potential biological agents for the control of FAW and possible opportunities to rear and release the agents to the field level		
	Achieved	Yes	
	Comments	<p>The survey in Qena and Sohag governorates revealed the presence of <i>Telenomus remus</i>, as well as other natural enemies, such as <i>Trichogramma</i> spp., Diptera, <i>Pseudogonia</i> spp., <i>Exorista</i> spp., Foridae, <i>Microplitis</i> spp. Other natural predators for FAW found during the survey included spiders, Orius, <i>Coccinella undecimpunctata</i>, Chrysopidae and <i>Labidura riparia</i>.</p> <p>The upscaling of mass rearing and mass production of biopesticides is recommended.</p>	
Activity 3.2	Training on the production of bio-pesticides		
	Achieved	Yes	
	Comments	<p>Two training programmes focusing on the production of biopesticides as well as the rearing and release of natural enemies of the FAW were implemented for enhancing the capabilities of MALR. This training was carried out online in November 2020.</p> <p>Two training programmes were also carried out at the Shandaweel Research Station in Sohag, and a session on the mass production of biopesticides was implemented for the Plant Protection Research Institute. A total of 140 stakeholders participated in these programmes, with 80 participants being trained on the mass production of biopesticides.</p>	
Activity 3.3	Training on rearing and release of natural enemies		
	Achieved	Yes	
	Comments	See above.	
Activity 3.4	Conduct evaluation study on the local implemented measures for managing FAW		
	Achieved	Yes	
	Comments	<p>An <i>in vitro</i> evaluation study was conducted on the efficiency of different natural enemies on FAW. All of the natural enemies demonstrated potential to be used as bio-agents against FAW under laboratory conditions. <i>T. remus</i> is a promising parasitoid that could be propagated and released in FAW infested fields after a field study evaluation. The most strongly recommended biopesticide for FAW, <i>Bacillus thuringiensis</i>, was also evaluated.</p> <p>The adoption of the FAMEWS application was also evaluated. Some technical problems in using the app were improved by FAO headquarters. It was re-evaluated in the field after the improvements were made.</p> <p>Other evaluation studies on managing FAW were partially implemented.</p> <p>Additional evaluation studies for different FAW management measures deployed in Egypt should be carried out.</p>	

Partnerships and Outreach

For more information, please contact: Reporting@fao.org

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