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SUPPORT TO ENHANCE PREPAREDNESS FOR FALL ARMYWORM INVASION AMONG COUNTRIES

November 2022

SDGs:



Countries: Burkina Faso, Cameroon, China, Egypt, Kenya, Malawi, the Philippines

Project Code: TCP/INT/3705

FAO Contribution: USD 493 000

Duration: 1 September 2019 – 31 December 2021

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Implementing Partners

Brazilian Agricultural Research Corporation (EMBRAPA); Centre for Agriculture and Bioscience International (CABI); International Centre of Insect Physiology and Ecology (ICIPE); Ministries in charge of fall armyworm control; World Agroforestry (ICRAF); Norwegian Institute of Bioeconomy Research (NIBIO); Pennsylvania State University.

Beneficiaries

Farmers, extension officers, and government staff.

Country Programming Framework (CPF) Outputs

CPF Burkina Faso (2017-2020)

Output 3.11: The capacities of public institutions and other stakeholders to design policies and regulatory frameworks related to animal and plant health, food safety and quality are strengthened.

CPF China (2021-2025)

Output 3.4: FAO analytical inputs and technical assistance have helped to strengthen China's capacity to engage in multilateral agreements to which it is a Party and transboundary platform to address emerging environmental, agricultural, and health issues linked to climate change.

CPF Egypt (2017-2022)

Output 1.4: Regulations and frameworks of sanitary and phytosanitary measures, sustainable agriculture, and good hygienic practices enhanced. Output 1.5: Surveillance, control and early warning of transboundary animal diseases and zoonoses, plant pests, and fish diseases strengthened.

CPF Kenya (2018-2022)

Output 3.1: Institutional capacities at national, county and community level for early warning, preparedness and rapid response to threats and crises strengthened - Activity 3.1.3: Strengthen county level capacity to comply with international standards, guidelines and practices for emergency preparedness and response (inclusive of plant and animal pests and diseases, drought and floods).

BACKGROUND

Fall armyworm (FAW) is a noctuid moth native to the Americas, which is considered a pest due to the substantial agricultural damage it can cause. Its larvae feed on over 80 crop species, including maize, rice, sorghum, millet, sugarcane, cotton, and various vegetable species, thus posing a threat to vital rural economies. The FAW was reported in Africa for the first time in early 2016 in West and Central African countries and rapidly spread throughout sub-Saharan Africa, causing significant agricultural and economic losses. The emergence of the FAW was confirmed in India and Yemen in July 2018 and was later reported in Bangladesh, Sri Lanka, and Thailand by 2019. A decline in agricultural productivity jeopardizes not only food security but also the livelihoods of farmers. Because of crop trade and the moth's remarkable flying capacity, the FAW has the potential to spread to further countries, posing a major risk to crop production, particularly cereals. In light of this, many countries have requested assistance to fight against the spread of the FAW and acquire management techniques, as well as monitoring and surveillance for early detection.

FAO initiated the Global Action for Fall Armyworm Control (2019-2022) as an urgent response to the rapid spread of the FAW. This initiative assists smallholder farmers, their associations, public institutions, national governments, and development partners in responding rapidly to FAW infestation. In this regard, FAO created a free mobile application for real-time FAW monitoring, the fall armyworm monitoring and early warning system (FAMEWS). The Global Action for Fall Armyworm Control has established a global coordination structure to foster an open and collaborative dialogue towards achieving science-based solutions. This coordination structure is composed of a steering committee (SC), a working group on resource mobilization (WGRM), a technical committee (TC), and seven technical working groups (TWGs). In addition, national task forces (NTFs) were created at country levels. FAO's Plant Production and Protection Division (NSP) provides technical leadership through the FAW Secretariat, in collaboration with the International Plant Protection Convention (IPPC) Secretariat. This approach allows all stakeholders, scientists, and governments to interactively discuss challenges and propose solutions that are tailored to each country.

The project took part in these coordination efforts and sought to assist newly infested countries in taking immediate action in response to the emergence of the FAW.

IMPACT

The project supported global efforts to sustainably manage FAW infestation in targeted countries. Implemented activities contributed to safeguarding farmers' livelihoods and protecting crop production, thereby contributing to Sustainable Development Goal (SDG) 2, which is geared towards ending hunger by 2030. By ensuring knowledge-sharing and cooperation for access to science and technology for a better management of FAW infestation across countries and ensuring availability of data, the project also contributed to SDG 17, which aims to strengthening the global partnership for sustainable development.

ACHIEVEMENT OF RESULTS

The TCP complemented and supported the Global Action for Fall Armyworm Control, offering opportunities for an enhanced global participation to help farmers and governments in responding to FAW infestations.

In addition to reorganizing the seven TWGs covering different areas of action, the project ensured that technical knowledge and experience gathered at the global level by the TWGs were shared with the various NTFs to allow for the development of national FAW management strategies and the implementation of FAW management practices.

Monitoring and early warning tools, particularly the FAMEWS, were improved throughout the project, offering a robust data depository for FAW analysis. Newly infested countries were also supported in raising additional financial resources, as well as developing communication and advocacy materials to sensitize the public. At the local level, awareness on sustainable FAW management among farmers, extension officers, and plant protection officers was increased, in particular their knowledge of local production of biocontrol agents.

By the project's completion, Burkina Faso, Cameroon, China, Egypt, Kenya, Malawi, and the Philippines had developed their own work plans, budgets, and geozone-specific integrated pest management (IPM) packages for sustainably managing FAW.



IMPLEMENTATION OF WORK PLAN AND BUDGET

In 2020, the project was revised to ensure enhanced support to the Global Action for Fall Armyworm Control. The new strategy included the designation of eight geographic zones, with one pilot country for each zone. Activities were then concentrated in these pilot countries, while other countries in the same geographic zones were involved through training activities and information exchange. In total, the project supported activities in seven countries of the eight pilot countries (Burkina Faso, Cameroon, China, Egypt, Kenya, Malawi, and the Philippines), as support to India was provided through another FAO-led project. Therefore, a six-month extension was agreed to allow all activities to be implemented. Nevertheless, all activities were completed within the planned budget.

FOLLOW-UP FOR GOVERNMENT ATTENTION

Additional funding was mobilized by the end of the project, enabling continuous support for the implementation of activities until 2023. Further resources and commitment are required to ensure continuity of the use of the FAMEWS.

To ensure sustainability of results, FAO committed to train its country FAO staff on FAW control from February 2022.

SUSTAINABILITY

1. Capacity development

New FAW management practices were introduced through farmer field schools (FFS), which bring together groups of farmers to learn how to transition toward more sustainable agricultural production. Additional awareness and training sessions were conducted for farmers, researchers, and extension officers on the identification of the FAW, protocols, and sustainable FAW management, as well as providing information on the insect life cycle and its effect on plants. Finally, six geozone training sessions and meetings were held. The training sessions were attended by over 270 participants, who learned about FAW identification, biology, pest management with biocontrol, and monitoring and early warning systems. In addition, the FAW Secretariat organized 13 global webinars, attended by over 1 770 participants.



Government employees improved their knowledge of sustainable FAW management. They benefited, in particular, from lessons learned and experiences shared during regional conferences on local production of biocontrol agents, *Trichogramma* and *Bacillus thuringiensis*, for the fight against the FAW. All training and communication materials, including the IPM package, were made available online.

2. Environmental sustainability

The project strongly discouraged the use of extremely hazardous pesticides and actively advocated for the use of biopesticides and other alternative treatments for FAW management.



DOCUMENTS AND OUTREACH PRODUCTS

Documents

- ❑ FAO. *Fall armyworm Control in Action newsletters 1 – 6*. <https://bit.ly/3sKpe9A>
- ❑ FAO. 2021. *Fall armyworm: Invasive pest threatening crops and food security*. (بودة الحشد الخريفية). 154 pp. <https://bit.ly/3zs6n6P>.
- ❑ FAO. 2021. *General guidelines for developing and implementing a regional integrated pest management strategy for fall armyworm control in demonstration countries*. 36 pp. <https://bit.ly/3fl9OW6>.
- ❑ FAO. *Guidance notes no 1 – 12*. <https://bit.ly/3NqzQUA>.
- ❑ FAO. 2021. *Integrated pest management (IPM) farmer field school (FFS): a guide for facilitators of FFS on maize with special emphasis on fall armyworm*. 108 pp. <https://bit.ly/3sK9gfm>.
- ❑ FAO/IPPC. *Prevention, preparedness and response guidelines for Spodoptera frugiperda*. 36 pp. <https://bit.ly/3TNxUrn>.

Outreach Products

- ❑ FAO. Global action for fall armyworm control: guidance notes. <https://bit.ly/3NqzQUA>.
- ❑ FAO. Global action for fall armyworm control webinars. <http://bit.ly/3EnTLiV>.
- ❑ FAO. 2020. Human-interest story “Exploring South–South cooperation approaches to tackle a global pest emergency”. <https://bit.ly/3sFJt8n>.
- ❑ FAO. 2021. Human interest story “Malawi farmers test FAW management solutions, including botanicals, through FFS”. <https://bit.ly/3DKHRk0>.
- ❑ FAO. 2022. Video on “Fighting back against fall armyworm: Josephine’s story”. <https://bit.ly/3fd1ury>.



ACHIEVEMENT OF RESULTS - LOGICAL FRAMEWORK

Expected Impact	Global food security is enhanced		
Outcome	Efforts to sustainably manage the FAW in selected countries of Africa, Near East and North Africa (NENA) and Asia regions are effectively supported		
	Indicator	Number of countries that have implemented practices and policies for the sustainable management of the FAW.	
	Baseline	0	
	End Target	Seven countries (Burkina Faso, Cameroon, China, Egypt, Kenya, Malawi, and the Philippines).	
	Comments and follow-up action to be taken	After the establishment of the Global Action for Fall Armyworm Control in December 2019, it was decided to support activities in Burkina Faso, Cameroon, China, Egypt, Kenya, Malawi, and the Philippines instead of other countries, as originally planned. These countries developed work plans and budgets, as well as IPM packages for each geozone, to sustainably manage FAW infestation.	
Output 1			
Output 1	Global Fall Armyworm Technical Working Groups (TWG) to incorporate colleagues from NENA and Asia strengthened and priority areas of work endorsed		
	Indicators	Target	Achieved
Baseline	Number of priority areas of work defined.	10	Partially
Baseline	0		
Comments	<p>The priority areas have been reorganized into seven TWGs:</p> <ul style="list-style-type: none"> – host plant resistance; – agro-ecology; – biological control; – pesticides and biopesticides; – monitoring and early warning; – farmer education and communications; and – quarantine and phytosanitary measures. 		
Activity 1.1	Regular video conferences with the TWGs are organized		
	Achieved	Partially	
	Comments	The TWG on quarantine meet regularly thanks to the support from the IPPC Secretariat, while other TWGs meet twice a year during TC meeting.	
Activity 1.2	Priority areas of work are identified		
	Achieved	Partially	
	Comments	The TWG on quarantine developed and published a guide on prevention, preparedness and response guidelines for <i>Spodoptera frugiperda</i> (FAW). It is available in English and French. Other TWGs contributed to the development of general guidelines on the development of a regional IPM strategy against the FAW. It is available in English only.	
Activity 1.3	Knowledge from the TWGs is transferred to FAO subregional offices		
	Achieved	Yes	
	Comments	The TWGs supported the NTFs in the development of national FAW management strategies and the implementation of field trials for identification of low-cost, locally available and environment-friendly FAW management practices.	

Output 2	A pool of Farmer Field School Trainers in place and awareness among all stakeholders (farmers/extensionists/plant protection officers) on sustainable FAW management, including local production of biocontrol agents enhanced		
	Indicators	Target	Achieved
	<ul style="list-style-type: none"> – Number of in-country training workshops conducted. – Number of regional workshops conducted. – Number of trainers who can identify FAW, use at least two sustainable management practices and implement them in FFS. 	<ul style="list-style-type: none"> – 7 – 6 – 80 	Yes
Baseline	<ul style="list-style-type: none"> – 0 – 0 – 0 		
Comments	FFS trainers and facilitators were trained on FAW identification, biology and sustainable management practices, IPM, biopesticides, and the use of natural enemies. In addition, government extension officers and plant protection officers participated in webinars on natural solutions, biopesticides, and monitoring and early warning systems.		
Activity 2.1	In-country workshops for trainers conducted		
	Achieved	Yes	
Comments	<p><u>Burkina Faso</u> Around 228 farmers and extension officers were trained on FAW management. A total of 50 participants participated in an online joint geozone training course for countries in Western and Central Africa on 7 October 2021.</p> <p><u>Cameroon</u> A total of 320 farmer leaders and extension officers, of whom 25 women, were trained on FAW identification, the implementation of the Global Action for Fall Armyworm Control, and insect life cycle and its impact on plants.</p> <p><u>China</u> A total of 49 participants participated in national training activities, including geozone and FAW technical training sessions, which took place between Northeast Asia and Southeast Asia (with participants from the Democratic People's Republic of Korea, Japan, the Republic of Korea, Cambodia, Malaysia, Myanmar, the Philippines, Thailand, and Viet Nam. A regional IPM package was developed. Representatives from all pilot countries met in March 2021 during a first geozone coordination meeting for implementing the Global Action for Fall Armyworm Control in Northeast Asia. In total, 600 individuals participated in meetings and training activities in 2021 in China.</p> <p><u>Egypt</u> Awareness and training programmes were held in 13 governorates for FAW specialists, researchers and 850 rice and maize farmers. The FFS was established as a training model in three locations in two governorates, and 17 geozone meetings and training sessions were held. In total, around 1 500 individuals participated in different training events.</p> <p><u>Kenya</u> A refresher training session was conducted for 54 FFS facilitators and extension officers. Four FFS were established as demonstration sites in two counties and almost 2 000 individuals took part in meetings and training activities. A geozone training course was conducted on 23 November 2021 for 51 participants.</p> <p><u>Malawi</u> Around 33 149 farmers, of whom 15 944 were women, were trained on FAW management in 12 districts. Collection and sharing of standardized monitoring data based used the FAMEWS. A geozone training course was conducted on 3 March 2021 for 53 participants.</p> <p><u>The Philippines</u> Around 400 farmers, of whom 40 percent were women, participated in the Bantay Peste Project, a community-based plant pest and disease forecasting and early warning system. They were trained in Pangasinan on FAW monitoring & scouting protocols and sustainable FAW management. Workshops on FAW's biology and ecology were held in several provinces for local government officials and for 800 corn farmers, of whom 30 percent were women, in 32 pilot season-long FFS in eight municipalities of Pangasinan.</p>		

Activity 2.2	Two regional conferences held to share experiences in the local production of biological control agents		
	Achieved	Yes	
	Comments	Five geozone training sessions were organized for Western and Central Africa (50 participants), East Africa (51 participants), Southern Africa (53 participants), South and North Asia (117 participants), and NENA regions (52 participants).	
Output 3	Monitoring, early warning and advice to farmers on FAW through further development and implementation of the Fall Armyworm Monitoring and Early Warning system (FAMEWS) and the FAO-PlantVillage Digital Assistant enhanced		
	Indicators	Target	Achieved
	Number of monitoring and early warning systems.	1	Yes
Baseline	0		
Comments	<ul style="list-style-type: none"> – The FAMEWS was updated. Satellite imagery is now used as a base map to avoid displaying country boundaries. Scouting and trap data are now being displayed at point level instead of country level. The mobile application is now available in various languages in India: Bengali, Gujarati, Hindi, Punjabi, Tamil and Telugu. – A new data architecture was introduced to import and process the data into FAMEWS global platform. The scouting and trap data came from Pennsylvania State University and FAO, and these data were imported and stored in the Google BigQuery database as raw data. Subsequently, the raw data were transformed into scouting dataset and trap dataset. Besides the data structure conversion, all languages were translated into English, errors in the submitted information were corrected and units of crop surface were converted into hectares in Google BigQuery. The output datasets for scouting and traps were then imported into Power BI for data analysis and data visualization. – The artificial intelligence assistant ‘Nuru’ was used to diagnose multiple diseases, such as FAW infections in maize, potato disease, and wheat disease. – Each scouting report collects a rich set of information on location, crop name, crop stage, crop system, crop variety and crop damage, irrigation, fertilizer, biopesticide and chemical pesticides, and FAW information on infested plants out of 50 sample plants and efficacy of pheromone traps. – The FAW monitoring data sets (FAW scouting and traps) were added to the geospatial platform. The member countries can now use this platform to merge various data sets on the same map. It allows for a better understanding of the behaviour and prevalence of the FAW and the link between different variables (such as weather and climate data) and FAW distribution. – The mobile application was downloaded more than 5 000 times. – More than 47 000 scouting reports and 13 000 trap reports were submitted and made available on the FAMEWS global platform by 5 000 FAMEWS users. 		
Activity 3.1	Synergies between various monitoring and early warning systems identified		
	Achieved	Partially	
	Comments	FAMEWS is one of the tools used to feed the database for crop monitoring and advisory. It provides support and advice to farmers when they have detected FAW in their fields. In collaboration with the Tanzania Meteorology Agency (TMA) information from different sources, including satellite data, ground stations and field report were analysed. In close collaboration with the Ministry of Agriculture and Rural Affairs (MARA), China, a monitoring and early warning system for Asia was developed.	
Activity 3.2	Sustainability chain for training of trainers established		
	Achieved	Yes	
	Comments	A total of 114 individuals in the Near East and Asia and 118 individuals in Africa participated in webinars on FAW monitoring and FAMEWS.	
Activity 3.3	High-level commitment obtained for use of FAMEWS		
	Achieved	No	
	Comments	The integration of FAMEWS into governments’ working plans depends on the financial and technical capacities to continue using this tool. However, no commitments for additional funding were made during this project.	

Output 4	Advocacy material produced and project proposals and/or concept notes developed		
	Indicators	Target	Achieved
	Number of communication materials and concept notes developed.	10	Yes
Baseline	No communication material and one concept note.		
Comments	The FAW global portal is constantly updated with meeting reports, success stories, information material and FAW management recommendations, including climate-smart agricultural initiatives.		
Activity 4.1	Advocacy material developed		
	Achieved	Yes	
	Comments	<p>Communication specialists of the FAW Secretariat prepared the following materials on a continuous basis:</p> <ul style="list-style-type: none"> – bimonthly newsletters (sent to about 800 unique recipients). – biweekly internal notes to senior management. – reports from SC meetings, TC meetings and geozone meetings. – success stories from the field. – communication through FAO corporate social media (Facebook, Twitter, and LinkedIn). – a number of webinars were organized and are all available on the FAW global portal. 	
Activity 4.2	Project proposals developed		
	Achieved	Yes	
	Comments	<ul style="list-style-type: none"> – From 2019, two new projects were developed, and additional funds were mobilized. – Guidelines for resource mobilization at country level were developed and are to be presented during the working group resource mobilization meeting in March 2022. – Training sessions for FAO staff at country level are to start in February 2022. 	

Partnerships and Outreach

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

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