Food and Agriculture Organization of the United Nations

REPORT

Regional Workshop

FAO Global Action (GA) for Fall Armyworm (FAW) Control in Africa (Malawi)

13-14 July 2022

FAW Secretariat, Global Action for FAW Control

Contents

Field visit to Chitedze Agricultural Research Station

[1] The workshop began with a field visit to the national demonstration site at Chitedze Agricultural Research Station, coordinated by **Mr Zhijun Chen,** FAO Representative in Malawi, and including **Mr Jingyuan Xia,** Director of FAO Plant Production and Protection Division (NSP).

[2] During the visit, botanicals being used in farmer field school (FFS) validation studies and other national demonstration projects were displayed, and collection and preparation of extracts explained. Presentations described the research focus of the Department of Agriculture and Research Services, mainly related to banana pests and fall armyworm (FAW), and an overview provided on validation studies for FAW management to inform integrated pest management (IPM) approaches in Malawi, and implementation of the Global Action for Fall Armyworm Control (GA) in Malawi.

[3] Botanical pesticides were presented by **Mr George Phiri**, Assistant FAO Representative in Malawi. He said that the focus of validation studies is on agro-ecological-friendly management options for FAW control, starting with agronomic methods that promote crop growth and suppress pest populations, and botanical methods that suppress the pest, reducing crop damage. These are integrated with biological control options for a complete IPM package. The package that has been developed and validated for southern Africa is translated into practice so that pilot countries under the GA can align their strategies to the regional package for IPM in southern Africa.

[4] Botanicals displayed were found to perform better than the synthetic pesticides that had been previously recommended for use in Malawi – some of which are hazardous. Farmers have been trained on the extraction process for these botanicals and their application (sprayed on the plant whorls or funnels using bottles). Before spraying, farmers scout their fields and apply pesticides only if they find 20 percent or more of fresh feeding damage. The botanicals are prepared by plucking the leaves or tubers, then crushing the plant, soaking overnight, and filtering debris.

[5] It was suggested that botanicals should be combined during extraction because they are more effective than when applied separately. Involving a biochemist to analyze the chemical composition of the botanicals and its impact on the environment was discussed. The botanicals are not registered their approval is being sought from the Agricultural Clearing Committee.

[6] Demonstrations are being implemented at the national level (Chitedze Agriculture Research Station), and regional level through the Lilongwe University of Agriculture and Natural Resources (LUANAR) in the central region, the Lweya irrigation scheme in the northern region, and Kasinthula Agriculture Research Station in the southern region. The national demonstrations are being implemented on 0.5 ha per treatment with nine treatments. Objectives are to scale up the use of sustainable and effective FAW management options in Malawi and southern Africa, disseminate information on best practices on FAW IPM

practices to farmers, and promote area-wide IPM strategies through joint monitoring, scientific research, technology exchange and sharing information of and experiences.

[7] Key technologies used at national level demonstrations include: botanical pesticides (*T. vogelii, N. mitis* and *A. indica*); positive checks (synthetic pesticide); and good agricultural practices such as maize-cowpea intercrop, maize-soybean intercrop, maize-pigeon pea intercrop and mulching.

[8] **Mr Wilkinson Makuma** presented a brief on the Department of Agriculture and Research's focus on FAW and banana pests. Research has been conducted on synthetic pesticides to manage FAW; however, it was discovered that farmers could not afford to purchase synthetic pesticides so farmers came up with their own indigenous solutions to FAW, adapted from their past experiences with other pests. Some of this indigenous knowledge had proven effective and it was agreed these can be validated and the knowledge disseminated to farmers for use. However, the information generated so far cannot be published because the chemical composition of the botanicals has not been analyzed. Work continues and more funds are needed to discover more botanicals for FAW control and their efficacy.

[9] Malawi has also been faced with banana bunchy top disease, and that virus has spread across the country affecting banana production. However, a few varieties showed some resistance and survived. The Ministry assisted farmers providing healthy banana plants to replace the diseased plants.

[10] **Mr Phiri** presented validation to inform IPM approaches in Malawi for FAW management. Since 2017, farmers in **Phalombe** district have had ten cycles of the validation studies of FAW IPM options in both winter and rainfed seasons. Since the introduction of these studies, farmers fully understand FAW. An agenda was developed including: scaling up public awareness, evaluation of synthetic insecticides, evaluation of botanicals and other indigenous substances, determination of the effects of Conservation Agriculture, strengthening national and regional crop pest monitoring, determining population dynamics and infestation levels.

[11] In 2017, IPM was recognized as the most effective and sustainable method in dealing with the pest in the medium to long term. FAO has supported the government with three components: strengthening national FAW monitoring and early warning systems, support through farmer field schools (FFS), and a programme to validate FAW studies over a range of geographical locations. The focus of the validation studies was global innovations for FAW management, and how these should form key components of the integrated pest management strategy in Malawi.

[12] Key innovations identified as effective and sustainable for FAW control through IPM include: botanicals locally found in various areas tested alongside recommended synthetic pesticides, local practices including physical crushing of FAW eggs and larva, refined soils, good agricultural practices, such as conservation agriculture-mulching, early planting etc., and push-pull.

[13] Monitoring is critical to farmers' decisions on when to apply control treatments. Farmers have been trained to understand FAW, its biology and identification. From the results of these studies, neem performed better than deltamethrin; crops treated with synthetic pesticide still have crops with holes; if *N. mitis* is used as a treatment, only 10 percent of cobs have FAW holes. The key message is that without effective management of FAW, infestations will persist throughout the season.

[14] **Mr George Lungu** briefed on the rollout of Fall Armyworm Monitoring and Early Warning System in Malawi (FAMEWS). A FAW taskforce formed in 2017, when the pest had spread across the country, developed a response plan through FAO on surveillance and monitoring of the pest. This supported capacity building, pheromone traps were procured and installed throughout the country, and the FAMEWS app was rolled out. About 2 600 pheromone traps have been installed throughout the country, 1 824 frontline staff have been trained, community-based forecasting groups have been strengthened; 192 forecasters are collecting data from the traps; 558 smartphones were distributed to frontline staff to collect data for FAMEWS; smartphones used to record FAW counts in the traps; and traps are monitored throughout for new FAW generations. However, the traps are now damaged and need to be replaced. Data is needed to upload the collected information into the system.

[15] **Mr Haswell Dambolachepa,** plant pathologist**,** presented results from a national demonstration site (rainfed season), implemented in 2021/2022 season. With support from FAO, demonstrations were implemented on a 10 ha piece of land. Objectives were to scale up use of sustainable and effective FAW management options in Malawi and southern Africa, effectively disseminate information on the best practices on FAW IPM to farmers and other stakeholders, plus comparison of best technology versus conventional approaches. Key technologies demonstrated include botanical pesticides (*T. vogelii, N. mitis* and *A. indica*), positive check (synthetic pesticide), and good agricultural practices such as maize-cowpea intercrop, maize-soybean intercrop, maize-pigeon pea intercrop and mulching.

[16] **Closing remarks: Mr Chen** said that future plans should include mainstreaming of IPM concepts and approaches in a national strategy, with guidelines on how to facilitate the validation, review, approval, and registering of local control methods. However, government should take responsibilities because projects alone cannot continuously support this work. Feedback from farmers is also essential and the ultimate objective of demonstrations is to show suitable, proven technologies and approaches for farmers by upscaling their application. Exchange visits, field days and dissemination to farmers have been arranged and included in a two-year work plan and the budget.

Hybrid information sharing session on field demonstration of Global Action on FAW in Africa

1. Welcome Remarks

[17] **FAO Country Office**: Mr Chen said that the FAW outbreak in Malawi, detected in 2016/2017 growing season, caused extensive crop damage and economic losses that hit smallholder farmers very hard. In response, FAO launched the GA initiative to scale up global, regional, and national actions to control the spread of the pest. Malawi was named one of eight

demonstration countries under the GA to develop and implement a national work plan and transfer knowledge and experiences to 11 pilot countries. FAO has been working with Malawi's Ministry of Agriculture and other partners in developing the national work plan, and setting up a national demonstration system where sustainable FAW control approaches are tested and validated for adoption. He said the present workshop provides a good platform for information exchange and experience sharing, as well as enhancing global, regional, and national collaboration to fight FAW and protect food and nutritional security, as well as the income security, of resource-poor communities.

[18] **Mr Sandram Maweru**, principal secretary, Malawi Ministry of Agriculture, said that FAW has remained the major pest for cereals such as maize, sorghum and millet since it was discovered in Malawi. For example, in the 2021-2022 season, about 304 583 ha of maize, sorghum and millet belonging to 621 31 farm families were infested by FAW. That represents about 20 percent of the total area put to maize in Malawi and demonstrates how widespread the pest is and the urgent need for management.

[19] **Mr Maweru** said that FAO provided financial and technical support to the Government of Malawi to develop an IPM package for GA implementation in southern Africa, and countries can adopt the package at local levels to have coordinated approaches in managing FAW. The GA strengthens national governments' capacity to support farmers, as well as policy and capacity development on IPM and community-based actions. The national FAW task force is coordinating Malawi's response to FAW and includes members from academia, NGOs, donor agencies and divisions of the Ministry, and has the mandate to head the implementation, monitoring and evaluation of FAW management in Malawi.

[20] Demonstration sites have been implemented in the past season at Chitedze, LUANAR and the Lweya scheme; however, a fourth site, Kasinthula, was lost due to flooding.

[21] **FAO NSP Division**: Mr Xia said the GA, implemented across Africa, the Near East, and Asia and the Pacific, has created a functional and effective coordination network across eight geo-zones, each with a demonstration country – one of which is Malawi. He explained the three objectives for the present workshop: promote information exchange among countries in Africa on IPM techniques and technologies against FAW, leveraging ongoing field demonstrations in Malawi; learning about the progress and results of the GA's implementation in demonstration countries in the last three years; and gathering suggestions from relevant stakeholders on the way forward for the GA. In the meantime, the GA Steering Committee has challenged everyone to extract lessons from battling FAW and apply these to manage other invasive pests and pathogens.

2. Briefing on Implementation of Global Action for FAW control in Demonstration Country Malawi

2.1. National Task Force, Malawi

[22] **Ms Ida Mwato**, Deputy Director, Department of Crop Development, Ministry of Agriculture, said the national task force agenda was to scale up public awareness of FAW, evaluate synthetic pesticides, evaluate botanicals and other indigenous methods for FAW control, determine effects of conservation agriculture on infestations, strengthen national and

regional crop pest monitoring and early warning systems, enhance national research capacity in insect rearing, determine the biology and behavior of FAW in the local environment, and identify and promote natural enemies for FAW control.

[23] In terms of monitoring and early warning systems, 2 668 pheromone traps were installed, 1 824 frontline staff trained in FAW monitoring using FAMEWS, 64 CBAF groups strengthened in FAW monitoring, 192 forecasters trained, 287 ADD staff trained in FAW monitoring using FAMEWS, and 568 smartphones distributed for monitoring using FAMEWS, she said.

[24] Farmers are adopting cultural control options as part of IPM to reduce reliance on synthetic pesticides (e.g. use of certified seed, use of organic manure, early planting, intercropping); as well, there is increased adoption of botanical pesticides; frequent monitoring and spraying based on scouting results; most farmers are now aware of low-risk pesticides and of indigenous control options like sand, fish soup, soap as well as physical control. Results from one FFS showed some of the promising botanicals and FAO and Lilongwe University of Agriculture and Natural Resources (LUANAR) are researching the biology and behavior of FAW in the local environment; as well as identification of natural enemies for FAW control. Results have led to identification of four parasitoids.

2.2. Research update on understanding the bio-ecology of FAW

[25] **Mr Trust Donga,** Lilongwe University of Agriculture and Natural Resources (LUANAR), explained his mandate to research the bioecology of FAW and systematize farmers' practices for the management of the pest. Observations from three agroecological zones –Mzimba, Salima and Lilongwe – have shown that in Malawi, a FAW moth lays up to 300 eggs in masses of up to three, and eggs take a very short time to hatch – the larval and pupal durations have been found to be very short compared to what is reported in the literature. Studies on botanical pesticides showed that neem oil, neem powder and a combination of neem leaves and Lippia javanica are very effective in FAW control.

[26] Challenges include: changes in the onset of rainfall season affected the implementation of activities, and global supply chain issues affected procurement of equipment for trials, and planning for emergencies. National plant protection organizations should be supported to develop and rehabilitate crop protection infrastructure, enhance human resource capacity and institute pest monitoring programmes.

2.3. Farmers' testimony on the effectiveness of indigenous methods on FAW control

[27] **Mr Chimwemwe Aironi** and **Ms Florence Nantchengwa** from Malawi’s Phalombe District said that indigenous methods are very effective and neen, fish soup, N. mitis and T. vogelii were successful. N. mitis was noted to be strong performer, is locally available and does not cause negative side effects to farmers and the environment. These management options performed better or at least favourably compared with synthetic pesticides, and sustainable FAW management options are likely to be environmentally friendly and less hazardous to public health.

[28] They said that the Government had initially distributed synthetic pesticides regularly used in controlling African Armyworm, Cypermethrin, to combat FAW. But what farmers did instead was apply aqueous plant extracts to infested crop fields. These were used locally to

control similar larvae types in vegetable production. The farmers established study fields to compare effectiveness of different innovative solutions and options to manage FAW and followed good agricultural practices including recommended agronomic practices such as timely planting. Through FFS testing, farmers learned that frequent and regular scouting for FAW eggs and larvae is necessary to understand infestation levels to inform management decisions. Scouting results determined whether to apply a treatment. They said governments must intensify research in the management of FAW; farmers as key stakeholders must be in the forefront of research activities on FAW management; government efforts in FAW management research activities must not divert focus from research activities on other constraints like climate change adaptation; and governments must expedite the process of clearing farmers' innovations on FAW management for wider adoption.

3. Reporting on Implementation of Global Action for FAW control in other demonstration countries

3.1 Kenya

[29] **Ms Rose Kamau,** Plant Protection Service Division, Ministry of Agriculture, Kenya, said that in 2020, FAW infestation levels increased. A national task force was established with members from the Ministry of Agriculture, pest control and product board, and academia. A two-year workplan was developed. Considering technology validation and efficiency, four demonstration sites were established with four FFS and an evaluation site has been established with one of the research organizations. Collection of data from the validation sites for season one has been completed, and for season two, data collection is in progress. The demonstration sites that were established are for small-scale farmers. Treatments include push-pull, maize cowpea intercrop, maize beans intercrop, botanical pesticides, one biopesticide, chemical and farmer practices as control options. One demonstration site was affected by heavy rainfall.

[30] Challenges include: inadequate training and capacity building, poor communication systems – farmers don't know where to report their findings – lack of appropriate equipment, and poor coordination and monitoring. The way forward includes a pest management strategy, a policy for management of invasive pests, and establish regional structure, regional monitoring and early warning systems.

3.2 Cameroon

[31] **Mr Colince Nguelo**, Directorate of Agricultural Development, Ministry of Agriculture and Rural Development (Minader), reported that monitoring with traps was conducted in two regions, field scouting conducted in all 10 regions of Cameroon. The University of Douala is testing various technologies to manage FAW, the Agricultural Research Institute for Development (IRAD) is testing biological pesticides and International Institute of Tropical Agriculture (IITA) is researching the Telenomus remus egg parasitoid for augmentative biological control of FAW. Three demonstration platforms are examining: how staggered sowing and late sowing can increase the percentage of FAW infestation, affecting yield; how the association of maize and local legumes can influence FAW infestation; the effects of adequate fertilization (organic and inorganic) on the incidence of FAW; the use of neem extracts and Bt based biopesticides in FAW control.

[32] He outlined numerous outreach initiatives as well as training, and said challenges could be solved through better coordination, training for pilot countries and testing and validations of technologies to manage FAW for further application to other pests.

3.3 Burking Faso

[33] **Mr Nabie Bekouanan**, Ministry of Agriculture, Animal Resources and Fisheries, and National Focal Point for GA, said that since FAW was confirmed in Burkina Faso in 2017, it has been reported all 13 regions of the country. Control efforts include: dissemination of IPM strategies, including surveillance and early warning through the use of the FAMEWS app, and pheromone traps for data collection; promotion of good farming practices (crop associations, organic or organo-mineral fertilisation, etc.); use of biopesticides (neem oil, baculovirus, Bt, extracts of neem leaves (Azadirachta indica and Hiptus suaveolens); biological control agents (Telenomus remus); and use of synthetic pesticides. Chemicals remain the main method of control of FAW by farmers; however, trials of biological control and other IPM technologies are underway at two universities and soon at the Environmental Institute for Agricultural Research (INERA).

[34] Lessons learned were: control actions of an invasive pest demand resource mobilization efforts; appropriate control technologies must be chosen quickly to control an invasive pest effectively and sustainably; producers see synthetic pesticides as the easy solution, but these aren't sustainable because of many negative impacts on the environment; and FAW is already developing resistance to pesticides, forcing growers to increase the dose or to turn to other control techniques.

[35] Challenges include: low capacity to quickly mobilise financial resources; need to widely disseminate IPM techniques to producers through agricultural extension services. Recommendations are to make financial resources available quickly; extend the GA to other diseases and pests of economic importance in each country; provide national plant protection organisations (NPPOs) with an effective surveillance, early warning and response system for better management of crop diseases and pests; and provide consistent and sustainable support to research institutions to develop innovative integrated crop pest management technologies.

4. Reporting of implementation of Global Action for FAW Control in African Region

Mr Orlando Sosa, Sub-regional Plant Production and Protection Officer, East Africa, reported on behalf of Mr Jean Baptiste Bahama, Regional Coordinator for FAW, that a number of regional coordination and information sharing meetings had been conducted in the first semester of 2022, including regular sharing of FAW-related knowledge and information products to members of the Coordination Unit for Plant Production and Health (CUPPAH). In addition, a number of technologies had been developed for FAW control in southern Africa.

Core activities planned for the second semester of 2022 include: a proposed African conference on FAW, organized in collaboration with the African Union Commission; a workshop on biological control and use of biopesticides against FAW; a sub-regional extension conference in the demonstration country to facilitate the sharing of knowledge,

experiences and communication materials with pilot countries; establishment and implementation of 60 FFS across the sub-region of southern Africa; dissemination of a technical note on joint FAO-Universite Joseph Kizerbo research on FAW management; and a meeting with national focal points in the sub-region of central Africa to develop National Action Plans.

5. Responses from Representative Stakeholders

[36] **Representative stakeholders** said that no recommended pesticide used had performed better than botanicals. The botanicals were not combined because they have different potencies. Youths should be engaged in the technologies for FAW control and demonstrations should have comprehensive communication strategies strengthened to ensure that information is disseminated to farmers.

6. Concluding remarks

[37] **Mr Xia** described Malawi as a very good example of how well a demonstration country under the GA can work. Mr Xia emphasized the importance of implementing IPM packages as part of the GA, and the value of integrating all resources available through research and extension. He noted that indigenous methods are being used more than synthetic pesticides. Mr Xia said that at the country level, field evaluations of IPM options will soon conclude and demonstrations and training will be accelerated. At regional level, coordination, information sharing across countries and resource mobilization will be strengthened. At global level, accelerating transfer of seed funding to countries will be accelerated, as well as impact assessments, and globally standardized protocols and analyses for IPM trials. With regard to his visit to the university, Mr Xia emphasized three conclusions: the important of integration, demonstration, and extension and research.

Group discussions: challenges, opportunities, and way forward

[38] Group one described challenges and opportunities in addressing crop pests and diseases, and questioned availability and accessibility of the raw materials for botanicals. As an opportunity, botanical materials can be easily propagated, and this can be an opportunity for smallholder farmers to venture into business. Adoption of technology is a challenge, as capacity building needs to be strengthened at national and regional levels. Poor coordination is also a challenge.

[39] Group two said IPM technology evaluation and validation were important. Challenges include a lack of proper coordination among various stakeholders, perhaps because no platform exists on which to share experiences. There is a lack of harmonisation on technologies in managing FAW and sharing of results by various players, a lack of proper validation and upscaling of technologies across all agroecological zones, a lack of resources to support the activities, and depletion of botanical pesticides is expected in the near future. Opportunities include investments in biological control measures – learning from experience of regional bodies, botanicals need to be propagated at a large scale to ensure availability. The way forward involves mainstreaming of national taskforces to ensure sustainability, and cooperation is necessary in FAW management.

[40] Group three said that effective dissemination of IPM technologies, understanding of the biology of FAW for effective management of the pest, harmonisation of IPM packages before dissemination, and knowledge generation are essential. Capacity building is also essential.

Appendix 1: Agenda

AGENDA ITEMS	DOCUMENT	PRESENTER	PROPOSED TIME
15 July 2022, 08:00-12:30. Morning: *Field Visits to Chitedze Agricultural Research Station* Coordinated by Mr Zhijun Chen, FAO Representative in Malawi			
Field visit • Travel to Chitedze Agriculture Research Station – Kandiyani (08:00-08:45) • Field demonstrations (IPM tactics vs. Control), Chitedze Agricultural Research Station – Kandiyani Irrigation Site		List of participants for in-person meeting **Presenters:** Mr Haswel Dambolachepa, Plant Pathologist Dr Elisa Mazuma, Deputy Director (Agricultural Research Services – Supporting Presenter Dr Wilkinson Makumba, Director-Agriculture Research Services Mr Benjamin Chisama, Technology Transfer Officer, Department of Agriculture Research. Mrs Ida Mwato, NFFP and Deputy Director, Crop Development Department Mr George Lungu, Principal Plant Protection Officer, Crop Developm Department Dr Godfrey Ching'oma, Director, Cr Development Department	5-6 hours including travel time in the morning
Lunch in Lilongwe			1.5 hours
15 July 2022, 14:00-16:30: Hybrid information sharing on field demonstration of GA on FAW in Africa Moderated by George Phiri, Assistant FAO Representative in Malawi			
1. Opening session			
1.1. Welcome remarks from FAO Country Office		Mr Zhijun Chen, FAO Representative, Malawi	5 minutes
2.2. Welcome remarks from the Ministry of Agriculture, Malawi		Mr Sandram Maweru, Principal Secretary, Malawi Ministry of Agriculture	5 minutes
3.3. Opening remarks by FAO NSP Division		Mr Jingyuan Xia, Director, FAO Plant Production and Protection Division (NSP)	5 minutes
2. Briefing on Implementation of Global Action for FAW Control in Demonstration Country of Malawi			

2.1. National Task Force, Malawi	Presentation (PPT)	Mrs Ida Mwato, Deputy Director, Department of Crop Development, Ministry of Agriculture	10 minutes
2.2. Research update	PPT	Mrs Trust Donga, Lilongwe University of Agriculture and Natural Resources/research partner representative	10 minutes
2.3. Farmer's perspective		FFS lead farmer representative	10 minutes
3. Reporting on Implementation of Global Action for FAW Control in Other Demonstration Countries			
3.1. Kenya	PPT	Ms Rose Kamau, Plant Protection Service Division Ministry of Agriculture, Kenya	10 minutes
3.2. Cameroon	PPT	Mr Colince Nguelo, Directorate of Agricultural Development. Ministry of Agriculture and Rural Development, Cameroon	10 minutes
3.3. Burkina Faso	PPT	Mr Bekouanan Clovis Nabie, Ministry of Agriculture and Food Security, Burkina Faso	10 minutes
4. Reporting on Implementation of Global Action for FAW Control in African Region	PPT	Mr Orlando Sosa Sub-regional Plant Production and Protection Officer, East Africa	10 minutes
Coffee Break/ Video for online participants			15 minutes
5. Responses from Representative Stakeholders		Attending stakeholders	30 minutes
6. Open Discussion (Major challenges and suggestions)		All participants	30 minutes
7. Concluding Remarks		Mr Jingyuan Xia	10 minutes
16 July 2022, 08:30-11:00: Conclusion meeting Moderated by Mr Matthew Abang Attended by invited NFPs and CO FPs of demonstration countries as well as Sub-regional and Regional Plant Production and Protection Officers and revenant stakeholders.			
Group discussions: Challenges, opportunities, and way forward			1 hour
1. Overall challenges and opportunities		Mr Ida Mwato/ Mr Adin Blokounon-Gobalan	
2. IPM technology validation and demonstration		Mr Rose Kamau/ Mr Orlando Sosa	
3. IPM dissemination and scaling up		Mr Bekouanan Clovis Nabie/ Mr Tristan Nondah	
Coffee break/ Video for online participants			15 minutes

Plenary meeting (reports)			
4. Reports from each group		Group rapporteur	30 minutes
5. Plenary discussion		Mr Mathew Abang	20 minutes
6. Conclusion remarks		Mr Jingyuan Xia	10 minutes

Appendix 2

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Figure 1: Group photo of the participants of regional workshop on the Global Action for Fall Armyworm Control implementation in Africa, Malawi, 14-16 July 2022.

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Figure 2: The sub-regional Agricultural Officers and Director Xia led the workshop breakout groups and conclusion meeting on 16 July 2022.