



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



INPUT AND FAW LEARNING STUDY FINAL REPORT

A CONSULTANCY TO ASSESS THE LEVEL OF EXPANSION OF INPUT DEALER BUSINESSES FOR SUSTAINABILITY AND THE IMPACT OF ADVANCE PEST MANAGEMENT FOR FALL ARMYWORM (FAW):



USAID
FROM THE AMERICAN PEOPLE



GHANA ADVANCE II PROJECT

COOPERATIVE AGREEMENT No. AID-641-A-14-00001

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ACKNOWLEDGEMENTS

Proven Ag Solutions and its affiliate consultants, especially those that worked on this study (Drs. John Azu, Yaw Osei-Asare, John Jatoo, and Isadore Armah) are grateful to the individuals and institutions that supported this study, “The Sustainability of OB Model Service Provision and Outgrower Businesses’ Networks Effectiveness and Efficiency in Engaging Other Actors in the Value Chains.” We would like to thank USAID’s ADVANCE project for the opportunity to work with the project to document their strides in the Ghanaian agricultural space. We are especially indebted to the ACIDI/VOCA staff, who provided valuable insight and contributions during the entire process. Most importantly, we wish to thank the enumerators, respondents, and all those with whom we interacted.

DISCLAIMER

This report is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of ACIDI/VOCA and do not necessarily reflect the views of USAID or the United States Government.

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LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---------|--|
| ADVANCE | Agricultural Development and Value Chain Enhancement |
| AEA | Agricultural Extension Agents |
| RAD | Rural Agro-Input Dealer |
| CAADP | Comprehensive Africa Agriculture Development Program |
| CABI | Centre for Agriculture and Bioscience International |
| DDA | District Department of Agriculture |
| EPA | Environmental Protection Agency |
| FAO | Food and Agricultural Organization |
| FAW | Fall Armyworm |
| FBO | Farmer Based Organization |
| FGD | Focus Group Discussion |
| M&E | Monitoring and Evaluation |
| ICT | information and communication technologies |
| MoFA | Ministry of Food and Agriculture |
| NGOs | Non-Governmental Organizations |
| OB | Outgrower Business |
| OG | Outgrower |
| PERSUAP | Pesticide Evaluation Report and Safe Use Action Plan |
| RADU | Regional Agriculture Development Unit |
| SSPs | Spraying Service Providers |
| USAID | United States Agency for International Development |
| VAA | Village-level agri-input agents |
| VSLA | Village Savings and Loans Association |

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EXECUTIVE SUMMARY

The USAID funded Agricultural Development and Value Chain Enhancement (ADVANCE) project aims at increasing the competitiveness of maize, rice and soybean value chains in northern Ghana to foster economic growth and reduce poverty among smallholder farmers and the population at large, in line with USAID's Feed the Future (FtF) strategy. The project's approach is to increase productivity, promote private enterprise development and investment, and ensure that benefits are realized equitably by men and women. The project adopts a comprehensive value chain approach, working with input dealers, nucleus farmers, Farmer Based Organizations (FBOs), aggregators, processors and end markets. The project reaching over 130,000 smallholders, increasing their access to mechanization services, agricultural production inputs, finance and markets, leading to improved productivity.

Agro-dealer development is one of the strategies the project adopted to improve yields of maize, rice and soybean. The project focused on creating an extensive network of input suppliers/retailers, and OBs, equipping them with business and technical knowledge to manage effective input distribution systems. Since 2014, USAID's ADVANCE project has directly trained 89 agro-dealers across the project operational areas. The project has developed market-based approaches for input supply through community input promotions, outgrower business (OB) input credit schemes, the village-level agri-input agents (VAAs) approach, buyer – outgrower input schemes, the village savings and loans associations (VSLAs) share out to coincide with input promotions, and commercialization of safe spraying service provision.

The project beneficiaries have increased the use of certified seeds and fertilizers by 50% as at 2017 (USAID's ADVANCE Gross Margins Survey 2017). The afore mentioned has necessitated the need to document the contribution of USAID's ADVANCE project in establishing sustained agricultural input networks to make inputs accessible to smallholders (through community promotions, financing via OB, FBO, VSLA share out, etc.), and open market access.

Assessment of the impact of the project's management of fall armyworm (FAW) revealed that, USAID's ADVANCE project through the FAW National Taskforce, has collaborated with key stakeholders including MoFA, Food and Agricultural Organization (FAO) - Centre for Agriculture and Biosciences International (CABI), the Food Research Institute (FRI), among others to develop an effective FAW pest management response that protect food security, livelihoods, and overall health by aligning key actors around a shared set of priorities. This has also helped to avoid duplication of activities among key stakeholders.

Effective pest management remains key in the project's objective to increase productivity, efficiency and competitiveness of Ghanaian agribusinesses in maize, soya and rice value chains. The threat of FAW to the attainment of this objective is worrying and therefore, the need for the study; to primarily assess the impact of FAW on productivity, explore the effectiveness of the strategies adopted to manage the pest and provide an opportunity for reflexive learning

Through employment of a mixed method approach, the study team collected and analyzed quantitative data on 147 smallholder farmers operating in Ashanti, Brong Ahafo, Northern, and Upper West and East Regions of Ghana. This sample was used for both input and FAW studies. The studies derived the sample frame from a population of 766 farmers that were sampled for the VSLA studies. They were purposively selected at a 95% confidence interval and 7.2% margin of error (MOE) using a design effect of 2.0. This is a deviation from the desired 5% margin of error. The sample was heavily skewed towards female smallholder farmers as they do not participate in input sales and provision of spraying services. This allowed us to specifically study women's access to inputs and management of FAW and enabled us to estimate the expansion of the input dealership. Additionally, a total of 127 individuals were interviewed individually or as part of focus group discussions comprising of 67 OGs, 21 OBs, 84 VSLA members, six Rural Agro-input Dealers (RADs), six VAAs, 10

Spraying Service Providers (SSPs), five Financial Institutions staff, four MoFA and two EPA staff. The study was aligned to the annual survey for adoption, crop yield and gross margin, from a random sample of farmers in the project database. The team also reviewed relevant literature.

Findings and Conclusions

The findings and conclusions related to the objectives of the study are stated below:

Assessment of the Level of Expansion of Input Dealer Businesses for Sustainability, Changes in the level of quality of access (timeliness, affordability, choice availability, etc.) to all types of inputs by smallholder farmers because of USAID's ADVANCE's intervention: More than 91% of the farmers from the survey use agro-inputs such as fertilizers, weedicides, seeds and pesticides in their farming business. They receive their supplies from the many input suppliers (and/or VAAs) who sell similar products and at similar prices ensuring that farmers do not have to travel far from their communities to purchase their required inputs. More than half (55.8%) of the farmers reported increased access to agro input because of the introduction of VAAs. Over 84% of farmers get all their inputs from available sources of input supplies. Out of this number, 78% now get their supplies from VAAs. Majority of farmers (57%) perceived no change in prices of agro-inputs before and after VAA was established in the community. There is regular availability of needed inputs (75.9%), easy access to quantities of inputs required and timely availability of inputs. The VAAs also provide an added value of training to the OGs on how to use the purchased agro-inputs. About 25.9% of farmers mentioned VAAs in their communities do not operate throughout the whole year. Reasons given by farmers for VAAs inability to operate throughout the year include; low demand for agro-inputs during the off-season (dry season); family and personal reasons; and lack of working capital to stock agro-inputs.

Profitability of adopting the proposed community agent strategy by wholesalers and retailers: Majority of RADs that were interviewed mentioned that the VAA strategy is a good strategy for them as it increased their sales (between a minimum of 12% and a maximum of 67%) annually. It provided them access to farmers in communities that would have been left not catered for had it not been for the VAA. Few challenges RADs faced with the VAAs was regarding default in payback of goods received and sold to farmers.

Effectiveness and efficiency of the various project strategies to promote farmers' access to agro-inputs: Majority of respondents from the qualitative survey confirmed that the project strategies have increased their access to agro-inputs compared to the past. According to respondents, OB's and FBO's provide agro-inputs to support prior to the commencement of the farming season which reduces their stress of accessing inputs at the right time. Some of the farmers affirmed that, the project strategies have resulted in avoidance of delays in accessing farm inputs. Comparatively there is a vast change in accessing agro-inputs in terms of timelines, payment, affordability and quality of products due to the strategies introduced by USAID's ADVANCE. Of the strategies introduced, respondents ranked the VAA strategy as the first; followed by OB input credit schemes and VSLA share out input promotions as second. These were followed by community input promotions, SSPs operations and buyer-sponsored outgrower input schemes in that order.

Category of persons involved/willing and the constraints involved in the input business expansion: The study revealed a male dominance in the input business within the entire study areas. Of the 89 RADs only 11 are females. All VAAs and SSPs on the project are males to reduce their exposure to harmful substances. Majority of the RADs are between the ages of 35 and 50 years. The few youths involved in input dealerships are thriving but need business management and administration support. Majority of the RADs are educated; with the less educated ones operating in the rural areas. Several people are willing to enter the input business but remain unsure of the operations involved. The few youths identified in the communities, who expressed interest, mentioned that they would appreciate if they could benefit from any training that would let them understand the operations of the input business. For constraints, poor access to low interest loans remains a major hindrance to the expansion of the agro input business. An input dealer in Tamale iterated, "*the business is profitable and I want to expand but my capital is not enough and it is not also safe to use bank loans to do this business because*

of the high interest rate and the pressure the financial institutions put on you in recovering their loan, making it risky to even go for loans to expand the business.” Another challenge is the delay in supply of inputs by suppliers.

Gender dimensions of increased access to and use, increased decision making, increase social capital and leadership in the community, time and energy saving aspects, etc.: OBs prefer to work with females than males because they consider them to be more credible as compared to their male counterparts. Female OGs mostly pay back inputs received; they also ensure whatever inputs are received are used for the intended purpose. This has greatly increased female access to and use of inputs in support of their farming activities. VSLA share-outs are scheduled before or to coincide with community input promotions, so that as OGs (dominated by females) take their savings they can pay for the required inputs. SSPs operations, VAAs and community input promotions have greatly ensured women have access to and use of agro-inputs to increase their productivity. The project has empowered women to increase production and productivity of their operations. Women have also strengthened their networks, shared sense of identity and understanding, trust and cooperation among themselves in their communities. Female leadership and decision-making skills have been built, making them capable of controlling their day-to-day lives in their homes and in their communities.

Current status of youth engagement, barriers and strategies to enhance their involvement: Despite the project's positive impacts on youth engagement, youth that are engaged in farming remains very low. Although farming and engagement in agribusiness enterprises by the youth could be rewarding and profitable, there are several barriers that prevent them from engaging in agriculture. The youth believe agriculture is still an old-fashioned industry; farming is for those who could not further their education which makes attracting youth to agriculture very difficult. High barriers to entry, particularly when it comes to the capital needed to set up and operate large tracts of farming land, low profitability, and the perceived high risk are also recognized. Other barriers include, access to land, functional literacy and numeracy, social networks and entrepreneurial confidences, selection processes (ACDI/VOCA, 2016), access to green jobs and markets and no and/or less engagement in policy dialogue (FAO, 2014).

Strategies to attract the youth into agriculture include; access to technology, information and better communication tools, coupled with immensely improved equipment are enabling the inclusion of the youth in agriculture. Other strategies include: 1) *Linking social media to agriculture*; 2) *Improving agriculture's image*; 3) *Strengthening higher education in agriculture*; 4) *Greater use of Information and Communication Technologies (ICT)*; 5) *Empowering young people to speak up*; 6) *Facilitating access to land and credit*; 7) *Putting agriculture on the school curricula*; 8) *Undertaking greater public investment in agriculture*; 9) *Making agriculture more profitable (Conway, 2014)* and 10) *Teaching young people to implement urban agriculture through a variety of modern methods and practices (FAO, 2014)*.

Results/impacts from crowding in from other non-supported actors and the impact competition has had on providing better quality services and business growth: Although RADs have competitors, this largely does not affect their sales, as every business within the market space has its customers. The competition, however, has prompted the RADs to stock quality products all the time to win over other customers. Most of the RADs could not provide information on their market share. OBs however have started dealing in agro inputs based on the services they provide to OGs.

Regulatory constraints that inhibit expansion of input dealership at the community level: Ghana has regulations on the registration, distribution and usage of pesticides to evaluate its environmental and human health effects known as Environmental Protection Agency (EPA) Act, Act 490 of 1994. RADs and VAAs in certain cases repackage fertilizers, pesticides and weedicides in smaller portions. This is in violation of section 44 (4) of the EPA Act. RADs and VAAs also do not always wear protective clothing and nose masks when in their shops. They usually sit outside the shop until customers come in. Not using protective clothing when handling agro inputs is also a violation of section 44 (1, 2 and 4) of the pesticides Act. All VAAs are

operating without licenses which is in violation of section 44 (4 and 5) of the Act. SSPs do not need to acquire licenses to operate as they do not retail agro-inputs. They however need documentation to prove their skill.

Assessment of the Impact of USAID's ADVANCE Pest Management Strategy for Fall Armyworm

Effectiveness of the media campaign on the knowledge of target beneficiaries on FAW: The project, has trained over 200 agriculture extension professionals to create awareness through field training, use of radio, posters, and call centers. FAW is generally known by majority of farmers (93.9%). Knowledge of FAW was found to be independent of whether one belongs to VSLA or not. More than 90% of farmers had knowledge of FAW. About 63.8% of the farmers received relevant information about FAW before the subsequent season. More female farmers (72.3%) received relevant information than male farmers (56.2%). Main sources of information for farmers include USAID's ADVANCE (84.5%), MOFA (61.5%), Radio/TV (52.3%) and district AEAs (42.2%). USAID's ADVANCE mode of reaching farmers were mainly through posters (57.3%), radio broadcasts (52.2%) and radio jingles.

Control of FAW was generally through spraying the farms with appropriate insecticides such as Bypel, Emastar and Attack. To a high extent, information provided on FAW helped 67.7% of farmers. More than 95% of the farmers mentioned the information received, helped in protecting their maize crops. About 63% of the farmers mentioned before the media campaign (2015) FAW attack reduced their yield highly. This proportion of farmers reduced to 14.5% in 2018 after the media campaign. Most of the farmers (92.3%) received FAW management training from USAID's ADVANCE. Others too received their training from MOFA (55.8%), District AEAs (39.4%) and other NGOs (19.2%). All the beneficiaries found the FAW management training useful. Deriving from the above, the media campaign was effective in controlling FAW.

Extent to which the beneficiaries who were trained shared their knowledge with other farmers:

The project has trained about 75.4% of sampled farmers on FAW management, how it affects crops (74.8%) and then when it attacks (73.8%). The least shared information on FAW is sources of information and assistance on FAW. On average (median), a farmer shares information with 10 other farmers.

Contribution of the fall army worm call center to the effectiveness of the FAW management strategy:

The call centers have received 537 calls from 515 men and 22 women. Most of the callers (66%) had called the FAW call center twice. The remaining 34% had either called once (17%) or thrice (17%). The main information farmers seek from the call center was how to control the FAW. All the farmers who called the FAW call center unanimously accepted that the information received was useful and 83.3% were able to apply the information they received from the call center.

Major constraints trained agents faced in supporting smallholders to manage FAW: The major constraints identified by respondents were lack of logistical resources to organize training for farmers (32%) and limited access to recommended pesticides (42%). Other challenges were inability to locate the sources of recommended pesticides (16%) and unavailability of smallholder farmers for training during the season (10%). Focus group discussions and key informant interviews revealed that factors such as delay in the distribution of recommended chemicals for training, availability of enough quantities of recommended pesticides, logistics, monitoring and evaluation of their work are also impeding the work of the trained agents.

How farmers are equipped to deal with a future outbreak of fall arm worm, other pest emergency and general pest management: MOFA is the main source of assistance to farmers in controlling FAW. This is followed by USAID's ADVANCE and farmers own knowledge. About 87% of the farmers have the necessary information to deal with FAW and other pest emergencies. The main areas farmers have armed themselves include the ability to identify FAW attack (82.8%) and awareness and understanding of FAW (75.4%). Physical and financial access to pesticides was the least known area about FAW (14.2%) in future

outbreaks of FAW or other pests. Concerning access to the required tools and equipment needed to control FAW and other pests in future outbreaks, about 60% responded in the affirmative.

The contribution of complementary activities by the FAW National Task Force: The FAW National Task Force is a multi-disciplinary force comprising MOFA, Development Partners and Agencies tasked to develop and implement strategies for the management of FAW. The project's collaboration with MoFA through the taskforce has helped synergize FAW management. The national taskforce has developed a national framework for quick response to FAW attacks. About 45% of the farmers have heard of MOFA FAW National Task Force through MOFA (79.0%), radio/TV (62.9%) and the USAID's ADVANCE Project (56.5%). All farmers who received support from the FAW National Task Force were satisfied with the assistance received including; training on the application of pesticides; SSP; pesticides application on farm; monitoring, surveillance and scouting for FAW; training on cultural practices to adapt to prevent FAW attacks; and control measures for FAW attack on farm

Recommendations

The following key recommendations emerged for “the assessment of the level of expansion of input dealer businesses for sustainability study”.

- The project should continue to support the development and operations of the VAAs to make them more effective and efficient, since losing VAAs for any reason would have negative effects on the farming businesses of the smallholder farmers they serve.
- The project should provide more support to RADs to remove all the constraints that continue to hinder their efforts to expand the input business, including poor access to finance and delay in supply of the inputs.
- The project should continue to empower and invest in rural women when various interventions are being implemented since even a slight improvement in the assistance they receive, will have a significant effect on productivity, incomes, health and overall livelihood of the rural household.
- Despite the project's positive impacts, youth engagement in farming and agribusiness remains very low. The project should design and implement innovative youth-engagement interventions that will remove the barriers facing the youth and motivate and attract them to consider careers in agriculture and agribusiness.
- In addition to the services provided by OBs to their outgrowers, a few of them have added-on input dealerships to their portfolio. This is a good idea and so the project should assist interested OBs with business plans to add-on other business ventures like input dealerships to their operations, so they can provide more inputs and productivity-enhancing technologies to the outgrowers they work with.
- Some activities being undertaken by RADs and VAAs are in violation of various sections of the National Environmental Protection Agency (EPA) Act, Act 490 of 1994. The project should encourage VAAs to register their activities with the EPA. It should also sensitize RADs and VAAs on the need for wearing protective clothing when handling agro-chemicals. SSPs should be provided with identification showing their skill status and the services they provide.

The following key recommendations emerged for “the assessment of the impact of USAID's ADVANCE pest management for fall armyworm (FAW) study”.

- The project should continue and sustain the provision of information to sensitize farmers on FAW so that the momentum in controlling the worm is not lost.

- The project should, therefore, design innovative strategies to motivate those trained in the management of the FAW, to share even more the knowledge they have acquired with many others in their communities.
- The project should continue to monitor incidences of FAW in the communities to prevent future devastating outbreaks. The project should continue building farmers capacity on the recommended cultural and landscape management options for control of FAW.
- The project should provide solutions to all the identified constraints that affected the trained agents who received training on the FAW and were tasked to support smallholder farmers in managing the FAW.
- The project should continue the partnership and collaboration with MoFA, through the FAW National Task Force to synergize FAW management of resources for training of various stakeholders and implementation of the national framework for quick response to FAW attacks.

I.0 INTRODUCTION

I.1 Background/Brief Program Description, Context and Rationale

The USAID funded Agricultural Development and Value Chain Enhancement (ADVANCE) project aims at increasing competitiveness of Agricultural value chains in northern Ghana to foster economic growth and reduce poverty among smallholder farmers and the population at large, in line with USAID Ghana's Feed the Future (FtF) strategy. The project's approach is to increase productivity, promote private enterprise development and investment, and ensure that benefits are realized by the vulnerable i.e. women, children and physically challenged. The project adopts a comprehensive value chain approach, working with input dealers, nucleus farmers, FBOs, aggregators, processors and end markets reaching almost 130,000 smallholders increasing their access to mechanization services, production inputs, finance and markets leading to improved productivity.

Agro-dealer development is one of the strategies the USAID's ADVANCE project adopted to improve yields of maize, rice and soybean. The project focused on creating an extensive network of input suppliers/retailers, and OBs, equipping them with business and technical knowledge to manage effective input distribution systems. Since 2014, USAID's ADVANCE project has directly trained 89 agro-dealers across the project operational areas. The project has developed market-based approaches to input supply through community input promotions, outgrower business (OB) input credit schemes, VAAs approach, Buyer – outgrower input schemes, the VSLA share out input promotions, and commercialization of safe spraying service provision.

In collaboration with input dealers and demo sponsors, the project organizes community input promotions to increase access to quality inputs by farmers in isolated communities. The input promotions represent the final stage of the demo process to increase the use of appropriate agricultural inputs. Through implementation of the outgrower business (OB) model, the project has facilitated \$3,924,550 cash loans from 36 Financial Intuitions (FIs) to 373 outgrower businesses (OBs) and 422 Farmer based organizations (FBOs) which together with OBs own equity have been used to purchase \$4,045,525 worth of inputs from 89 Agro-Input companies to support 131,134 smallholder farmers crop production. The project beneficiaries have increased the use of certified seeds and fertilizers by 50% as at 2017 (USAID's ADVANCE Gross Margins Survey 2017). The afore mentioned has necessitated the need to document the contribution of the USAID's ADVANCE project in establishing sustained agricultural input networks to make inputs accessible to smallholders (through community promotions, financing via OB, FBO, VSLA share out, etc.), and open market access.

For that of the assessment of the impact of USAID's ADVANCE's pest management for fall armyworm (FAW), USAID's ADVANCE through the FAW National Taskforce, has collaborated with key stakeholders including MoFA, Food and Agricultural Organization (FAO) - Centre for Agriculture and Biosciences International (CABI), the Food Research Institute (FRI), among others to develop an effective FAW pest management response that protect food security, livelihoods, and overall health by aligning key actors around a shared set of priorities. This has also helped to avoid duplication of activities among key stakeholders. From the results obtained through various scouting methods, the average regional moth counts (pheromone trap data), that is, moth per trap per day (M/T/D) were highly correlated with the percent of plants with small, fresh, windowpanes (%PWP) from field scouting data.

Effective pest management remains key in the project's objective to increase productivity, efficiency and competitiveness of Ghanaian agribusinesses in maize, soya and rice value chains. The threat of FAW to the attainment of this objective is worrying and therefore, the need for the study; to primarily assess the impact of FAW on productivity, explore the effectiveness of the strategies adopted to manage the pest and provide an opportunity for reflexive learning.

1.2 Purpose and Expected Use of the Study

The purpose of the study is to document the contribution of the USAID's ADVANCE project in establishing sustained agricultural input networks to make inputs accessible to smallholders (through community promotions, financing via OB, FBO, VSLA share out, etc.), and open market access. The assessment seeks to learn how effective the strategies adopted are, in improving farmers' access to and use of agro-inputs.

1.3 Objectives of the Study

The specific objectives of the study are as indicated below:

- Determine any changes in the level and quality of access (timeliness, affordability, choice etc.) to all types of inputs by smallholder farmers as a result of USAID's ADVANCE interventions.
- Determine the profitability of adopting the community agent strategy proposed and adopted by some wholesalers and retailers
- Determine the effectiveness and efficiency of the various project strategies (community promotions, financing via OB, FBO, direct retailers, input agents, etc.) to promote farmers' access to agro-inputs
- Determine the category of persons involved/willing and the constraints involved in the input business expansion
- Determine the gender dimensions of increased access to and use, increased decision making, increase social capital and leadership in the community, time and energy saving aspects, etc.
- Determine status of youth engagement, barriers and strategies to enhance their involvement

Determine any results/impacts from crowding in from other non-supported actors (OBs, buyers and input agents, etc.) and the impact competition has had on providing better quality services and business growth

The following hypotheses were tested:

- Community input promotions are profitable for input dealers
- Input dealer expansion leads to increased access to input by smallholder farmers
- Input dealer expansion results in improved agricultural practices among men and women smallholder farmers.
- Input business expansion through community input promotions, outgrower business (OB) input credit schemes, VAAs approach, Buyer – outgrower input schemes, the VSLA share out input promotions, and commercialization of safe spraying service provision lead to increase in smallholder farmer productivity
- There are regulatory constraints that inhibit expansion of input dealerships into small communities

In the case of assessing the impact of the USAID's ADVANCE project pest management strategy for FAW, the study aimed to address the following objectives:

- The effectiveness of the media campaign on the knowledge of target beneficiaries on FAW.
- The extent to which the beneficiaries who were trained shared their knowledge with others.
- The contribution of the FAW call center on the effectiveness of the management of FAW.
- The major constraints the trained agents faced in supporting smallholders and their management of the FAW.
- To what extent are farmers equipped to deal with future outbreaks of FAW, other pest emergencies, and general pest management.

In the case of assessing the impact of the USAID's ADVANCE project pest management strategy for the FAW study, the study aimed to address the following objectives:

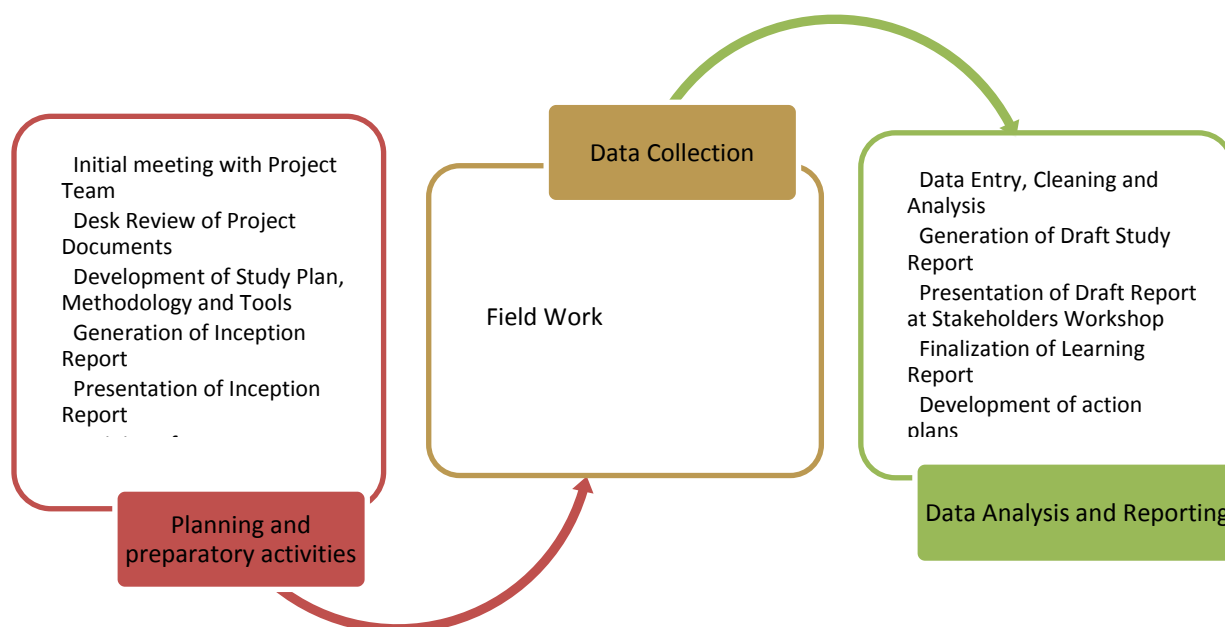
- The effectiveness of the media campaign on the knowledge of target beneficiaries on the FAW
- The extent to which the beneficiaries who were trained shared their knowledge with others.
- The contribution of the FAW Call Center to the effectiveness of the management of FAW.
- What major constraints the trained agents faced in supporting smallholders to manage the FAW

- How are the farmers equipped to deal with future outbreak of FAW, other pest emergency and general pest management?

2.0 METHODOLOGY AND DATA COLLECTION TECHNIQUES

The study involved both desk (secondary) and field (primary) research. An initial and extensive review of reports, literature review and research was conducted in assessing the level of expansion of input dealer businesses for sustainability and the impact of USAID's ADVANCE pest management for fall armyworm (FAW). The literature review was complimented with field work to collect the required data. The research study was undertaken in three (3) different stages including planning and preparatory activities; data collection; and data analysis and report finalization. Figure 1 is a diagrammatical presentation of the approach used.

Figure 1: Our Approach



2.1 Stage I - Planning and Preparatory Activities

Proper planning and preparation is *sine qua non* for the successful delivery of any project regardless of its size. Improper or lack of project planning is a recipe for disaster. Failure of any project regardless of its size or dimension can mostly be traced to lack of effective planning. Proven ag solutions therefore deployed a highly competent and seasoned team with experience spanning over 35 years to develop a well-thought out plan that underpinned the successful delivery of the project. During planning meetings, deliberations ensured appropriate answers to all questions of the 5ws and how were identified. At this stage the various activities to deliver the project objectives were identified, workload allocated, and responsibilities defined as well as articulated views on mapping out a broad strategic approach to ensure effective service delivery to the client.

2.1.1 SAMPLE FIELD SURVEILLANCE OF STUDY LOCATIONS, TARGET COMMUNITIES, AND RESPONDENTS

The population covered was Agro Input Dealers, Village-level agri-input agents, Safe-spraying Service Providers (SSPs) and smallholder farmers. A purposive and quota technique was factored in the sampling to reflect the gender dimensions and inclusivity. Together with the USAID's ADVANCE M&E Team, the quantitative sample was derived from the 2017 gross margins sample of farmers in the project database. Using the sampled

farmers of 766 for the VSLA studies as the population, the team purposely selected 147 smallholder farmers at a 95% confidence interval, 7.2% margin of error (MOE). The sample was heavily skewed towards female smallholder farmers as they do not participate in input sales and provision of spraying services. This allowed us to specifically study women's access to inputs and also estimated the expansion of the input dealership.

From the initial assessment, a multi-stage sampling technique was used in selecting the respondents. A stratified random sampling technique was adopted to select each category of input dealers (wholesalers, retailers and OBs who also retail), OBs, smallholders (OGs) and OBs' agents. This was to ensure the selected respondents are proportional to the sizes of the various categories and regional beneficiary populations while accommodating gender and youth proportions in the population. The purpose of applying stratified sampling was to ensure each unit within the cluster is given the same opportunity of representing the population.

2.1.2 SURVEY INSTRUMENTS

Data was collected using semi structured questionnaires for in-depth interviews and a guide for focus group discussions (FGDs). The quantitative data was digitally collected using the DataWinners software and administered on tablets. However, field staff were supplied with copies of the paper versions of the questionnaire as back-ups. Key Informant Interviews and FGDs were conducted at locations convenient to the respondents while ensuring confidentiality of proceedings. All conversations were digitally recorded and subsequently transcribed by the research team. Field notes were taken to complement the digital transcripts.

2.1.3 SURVEY QUESTIONNAIRE DEVELOPMENT

Draft data collection tools were developed based on inputs from the documents reviewed and the objectives and hypotheses outlined in the TOR. Different data collection tools were designed for the different stakeholders including focus group discussion guides (smallholder groups), key informant interview guides for project staff, and identified institutional partners. The data collection tools were presented along the major themes of relevance, efficiency, effectiveness, impact and sustainability and external utility of the project. These draft questionnaires were submitted to USAID's ADVANCE for review and their feedback incorporated to finalize them. They were later field tested to ensure they were understandable and collected the required information.

2.1.4 HARMONIZATION OF THE QUESTIONNAIRES

USAID's ADVANCE organized a meeting bringing together all the consultants for the five studies to harmonize the various tools and questionnaires into a single elaborate one. Similar questions were removed to ensure the enumerators did not repeatedly ask the respondents the same questions during the data collection process. Other issues discussed during this meeting were the training of enumerators, pre-testing of questionnaires and the field data collection plans.

2.1.5 TRAINING OF ENUMERATORS

The information gathering exercise was preceded by an orientation and training workshop for all the enumerators who were involved in the field work. This enabled them to understand both the general and specific objectives of the exercise for effective information gathering and delivery. The USAID's ADVANCE M&E team were responsible for recruiting the enumerators and ensuring the training was organized.

2.1.6 TESTING OF HARMONIZED QUESTIONNAIRE

The harmonized questionnaires were pre-tested, validated and finalized for field data collection. All trained enumerators and consultants participated in this exercise to ensure uniformity and conformity.

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2.2 Stage 2 - Data Collection

Data collection commenced once pre-testing of the data collection tool was completed, with all materials and equipment provided to enumerators. Aside data collection by the enumerators, the Proven Ag Solutions' team also conducted several focus group discussions (FGDs) with smallholder groups, community members in the small towns targeted under the project and conducted key informant interviews with project staff, OBs, MoFA, RADU and DDA staff, EPA and other identified respondents. Sampling units were informed in advance in anticipation of the research exercise to ensure key participants made time for the evaluation team. USAID's ADVANCE paid for all enumerators and data collection activities as agreed during the inception meeting.

2.2.1 QUALITY CONTROL

This involved regular debriefing meetings between enumerators and team members to discuss problems faced during the survey and vetting of completed questionnaires by the supervisory team members. Data was reviewed daily by the USAID's ADVANCE M&E team and queries generated and relayed to the field staff were resolved before moving to the next study community.

2.3 Stage 3 - Data Analysis and Reporting

2.3.1 DATA CLEANING AND ANALYSIS

Once data collection was completed from the field, the data was cleaned and analyzed. The analyzed data was shared with USAID's ADVANCE for review before report writing commenced. The data was analyzed using well-established quantitative statistical tools/methods including, SPSS and Excel to compute descriptive statistics such as frequency, counts, scores, percentages, arithmetic means and cross tabulations.

2.3.2 PREPARATION OF DRAFT RESEARCH REPORT

The draft research report was developed from the data collected from the field and submitted to the USAID's ADVANCE Project Management Team.

2.3.3 PRESENTATION OF DRAFT REPORT AT STAKEHOLDERS WORKSHOP

A Microsoft PowerPoint presentation of the Research Report highlighting key findings, conclusions, recommendations and lessons learned will be developed for sharing at a stakeholder's workshop. The slides will be submitted to the USAID's ADVANCE Project Management team before the workshop. The workshop will be held at an agreed location with USAID's ADVANCE Project Management Team facilitating logistics arrangement.

2.3.4 FINALIZATION OF RESEARCH REPORT AND DEVELOPMENT OF ACTION PLANS

Subsequently, when comments were received from the USAID's ADVANCE Project Management Team on the draft research report, they were incorporated into the final research report for completion. The final research report was submitted in electronic format.

2.4 Limitations of the study

The study derived its sample frame from 766 farmers that were sampled for the VSLA studies. 147 smallholder farmers were purposively selected at a 95% confidence interval and 7.2% margin of error (MOE). This is a deviation from the desired 5% margin of error. The sample was heavily skewed towards female smallholder farmers as they do not participate actively in input sales and provision of spraying services. This was compensated with the qualitative survey targeting majority of male respondents for all actors. Another major limitation was the recall of respondents on activities conducted over the periods in question. Based on the respondents targeted and reached, it is possible and plausible to consider the study as more qualitative than quantitative; invariably, the analysis depended heavily on qualitative data analysis.

3.0 MAIN FINDINGS

This chapter presents key findings of this study on “the Level of Expansion of Input Dealer Businesses for Sustainability and the Impact of USAID's ADVANCE Pest Management for Fall Armyworm (FAW).” The results and findings answer the objectives and hypotheses of the study. The analysis synthesizes qualitative and quantitative findings of the study

3.1 Respondents Demographics

| Study Demographics | | |
|----------------------|------------------|----------------|
| Regions | # of Respondents | % |
| Ashanti | 3 ↓ | 2.04% |
| Brong Ahafo | 4 ↓ | 2.72% |
| Northern | 90 ↑ | 61.22% |
| Upper East | 19 ↓ | 12.93% |
| Upper West | 31 ↓ | 21.09% |
| TOTAL | 147 | 100.00% |
| Gender | | |
| Gender | # of Respondents | % |
| Female | 145 ↑ | 99% |
| Male | 2 ↓ | 1% |
| TOTAL | 147 | 100% |
| Marital Status | | |
| Marital Status | # of Respondents | % |
| Never married/single | 2 | 1.36% |
| Married (polygamous) | 63 | 42.86% |
| Married (monogamous) | 68 | 46.26% |
| Separated | 2 | 1.36% |
| Divorced | 2 | 1.36% |
| Widowed | 10 | 6.80% |
| TOTAL | 147 | 100% |
| Age | | |
| Age | # of Respondents | % |
| 18 - 29 | 15 | 10.20% |
| 30 - 39 | 49 | 33.33% |
| 40 - 49 | 52 | 35.37% |
| Above 49 | 31 | 21.09% |
| TOTAL | 147 | 100% |

A total of 147 OG respondents availed themselves to be part of the quantitative study as depicted in Figure 2. Out of this Northern Region had the highest respondents of 90 making up 61.22% of the total respondents. The rest had 3, 4, 19, and 31 for Ashanti, Brong Ahafo, Upper East and Upper West respectively.

In the case of gender, the quantitative study had 99% of the respondents being female.

Majority of respondents (89.12%) were married. Single, divorced, and separated respondents had a representation of 1.36% each. Widowed respondents formed 6.8% of total respondents

For the age of respondents, majority of respondents (35.37%) were between the ages of 40-49 years. The next were those aged between 30 and 39 representing 33.33%. Respondents above 49 years recorded 21.09%. Respondents within the youth category (18-29 years) formed 10.20%.

In the case of the qualitative survey as depicted in Figure 3, the consultants spoke to 126 respondents (83 male and 43 female) either in focus group discussions or using key informant interviews. Some of the respondents had dual or triple roles, as such they were interviewed on all their activities. The respondents comprised of 67 OGs, 21 OBs, 84 VSLA members, six agro input dealers, six VAAs, 10 Safe-spraying Service Providers (SSPs), five Financial Institutions staff, four MoFA and two EPA staff.

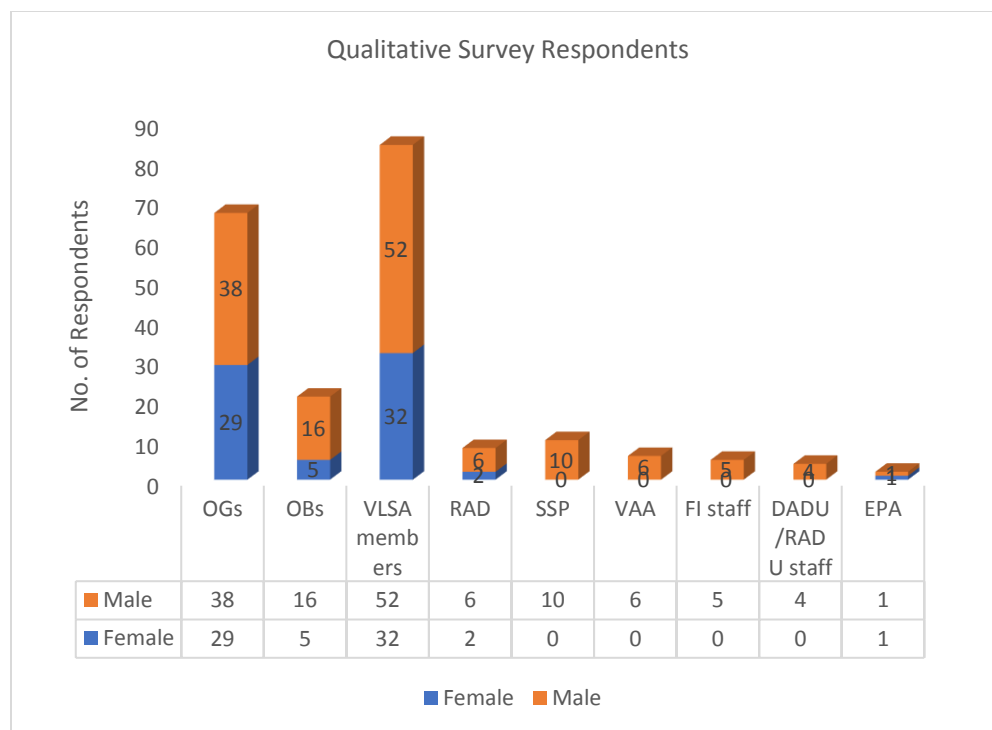


Figure 3: Gender dimensions of Qualitative Survey Respondents

Source: Field Survey, 2018

3.2 Assessment of the Level of Expansion of Input Dealer Businesses for Sustainability

3.2.1 INTRODUCTION

It is essential that smallholder farmers sustain their use of productivity-enhancing inputs and technologies. Many areas, particularly remote rural areas have remained grossly underserved, resulting in a dramatic reduction in farmers’ access to productivity enhancing inputs and technologies with far reaching implications on the food security status. An agro-dealer is a locally based entrepreneur who sells seeds, fertilizer and agro-chemicals to farmers in remote areas. The overall vision is that a network of small scale, entrepreneurial agro-dealers would transform the currently fragmented input distribution system into an efficient, commercially viable input infrastructure which would in turn enable farmers to have greater access to productivity enhancing inputs and technologies (Adesina, 2009). This vision is inspired by the fact that lack of access to basic farm supplies has made it quite challenging for poor rural farmers to increase their yield or income, reinforcing widespread poverty.

3.2.2 CHANGES IN THE LEVEL OF QUALITY OF ACCESS (TIMELINESS, AFFORDABILITY, CHOICE AVAILABILITY, ETC.) TO ALL TYPES OF INPUTS BY SMALLHOLDER FARMERS AS A RESULT OF USAID’S ADVANCE’S INTERVENTION

There are several interventions that USAID’s ADVANCE project is implementing and most of these have the potential for increasing availability and access to inputs. There is an increased demand of inputs due to the promotion of various productivity enhancing inputs and technologies through various ICT strategies and agricultural information through SMS and voice mail, establishment of safe-spraying service providers, provision of services through the OBs, and use of demonstration plots to demonstrate productivity enhancing inputs and technologies, pre-agribusiness forum, community input promotions, input dealer business development program, ICT outreach and production technology dissemination. With OBs having the capacity

to get financing and bring inputs to the doorsteps of outgrowers, outgrower business management training also increases the availability and access to inputs. VSLAs empower farmers to use their payout to purchase inputs, and payouts are organized to coincide with the community agro-input promotion events. Establishment of VAAs to reduce the transportation and transaction costs also increase access to and availability of inputs.

Agro-Inputs Use among Farmers

About 44.2% of the communities engaged with had input suppliers. There were more input suppliers in Brong-Ahafo, Northern, and Upper East than Ashanti Region. Input suppliers in communities range from 1-30 with most communities having about 10 input suppliers and most of the farmers (95.4%) mentioned that the input suppliers sell similar products. About 85% of the farmers said the agro-input dealers sell at similar prices. More than 91% of the farmers use agro-inputs such as fertilizers, weedicides, seeds and pesticides in their farming business. Most farmers who use agro-inputs on their farms receive their supplies from the many input suppliers (and/or VAAs) who sell similar products and at similar prices ensuring that farmers do not have to travel far out of their communities to purchase their required inputs.

USAID’s ADVANCE gross margins data (2018) on application of improved technologies and management practices collected during both phases of the gross margin survey is presented in Table 1 below. A total, of farmers 74, 611 out of **78,978** beneficiaries in FY18 cultivated 59,372.76 ha under improved land-based technologies. The total number of beneficiaries that applied improved land based and non-land-based technologies and management practices was 75,545 which is 169% of the FY2018 target of 35,000.

Table 1: Application of technologies by farmers

| Technology Type | Application Rate Women (%) | Application Rate Men (%) | # of Women Applying | # of Men Applying | Area Applied to (Ha) by Women | Area Applied to (Ha) by Men |
|---------------------------------|----------------------------|--------------------------|---------------------|-------------------|-------------------------------|-----------------------------|
| Crop genetics | 34 | 43 | 12,899 | 16,101 | 9,632 | 16,895 |
| Soil related | 56 | 61 | 21,280 | 23,171 | 15,156 | 22,953 |
| Cultural practices | 70 | 78 | 26,885 | 29,542 | 18,056 | 26,537 |
| Pest management | 75 | 77 | 29,003 | 29,096 | 18,836 | 26,189 |
| One or more land-based | 98 | 98 | 37,540 | 37,071 | 33,435 | 25,938 |
| One or more technologies | 99 | 99 | 37,967 | 37,578 | | |

Source: USAID’s ADVANCE GM Survey, 2018

Women farmers most often applied pest management and cultural practices technologies, and applied crop genetics less often. Men most commonly applied soil-related practices and pest management technologies.

The various strategies of community input promotions, OB input credit schemes, VAA approach, Buyer – outgrower input schemes, VSLA share out input promotions, SSP operations have invariably contributed to the increased application of technologies and also adopting more than one technology in outgrowers and OBs operations.

Effect of Input Promotion Strategies on Farmers Business

Availability

All agro-inputs dealers interviewed sell different quality brands of improved seeds, liquid and solid fertilizers, weedicides, pesticides, fungicides, and agricultural tools and equipment (e.g. cutlasses, hoes, knapsack sprayers, etc.). Two out of the eight agro-input dealers interviewed sold poultry feed. The most purchased agro-inputs are weedicides and fertilizers. All products sold are of the highest quality with input dealers usually taking

stringent methods in assuring quality of products on their shelves. All the agro-input dealers iterated they can distinguish between fake and genuine products.

Of the 84.4% of the farmers who can get all their inputs from the available sources of input supplies, 78% now get their supplies from VAAs. The remaining 15.6% could not access all their inputs including fertilizers, weedicides, seeds and pesticides. Surprisingly, VAAs could not supply timely inputs to the farmers. From focus group discussions, respondents mentioned that weedicides in general are always available from input dealers and VAAs. Fertilizers, improved seeds and some selected pesticides (e.g. FAW pesticides) takes some time before VAAs and input dealers are able to supply. Of the 58 farmers who confirmed VAAs are operational in their community, 67.2% could timely access all their inputs from the VAA;

Outgrowers also indicated that the OB input credit schemes also contributed massively in ensuring they had access to quality inputs at the right time. The SSP operations ensured they had access to the required equipment and application of the agro-chemicals appropriately as they have been trained to undertake these services for the OGs. In the communities where input promotions were undertaken, majority of OG respondents mentioned it was beneficial. It aided them to procure the rest of their input needs. They however mentioned that although beneficial, it would be good if they could purchase on credit similar to OBs frequently providing them inputs on credit.

84%
**Farmers can access
all their inputs
from agro-input
dealers**



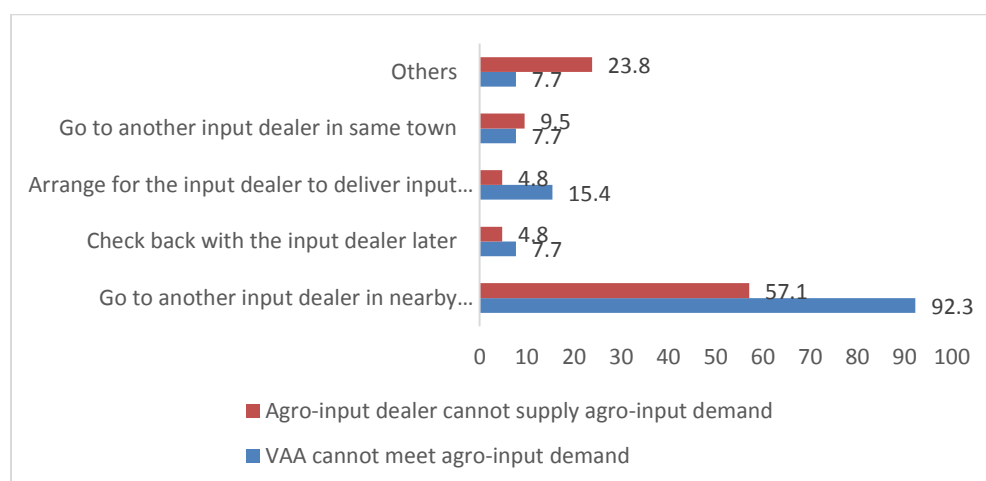
78%
**Farmers can access
all their agro-
inputs needs from
VAAs**

Figure 4: Farmers Sources of Agro Inputs

Source: Field Survey, 2018

Figure 5 below shows alternatives available to farmers when input dealers and VAAs could not meet their demand. The results show that when VAAs and input dealers cannot meet the demand of agro-input, most farmers' alternative is to go to the nearby town/city. Some farmers with VAAs (15.4%) also arrange with the VAA to deliver the input later whiles farmers without VAAs try to purchase the inputs on market days (14.3%) or go ahead with the farming without using agro-inputs (9.5%).

Figure 5: Alternatives available to farmers when input dealers and VAAs could not meet their demand



Source: Field Survey, 2018

Other added benefits derived from the operations of the VAAs and other input strategies include more stable input prices, easier access to quantities of inputs required and regular availability of needed inputs as shared by farmers.

Access

Only 40% of the farmers mentioned that they had VAAs in their community and farmers generally had to travel an average (median) distance of 5 km to the nearest agro-input dealer. Sources of agro-input supplies to farmers before VAAs activities are presented in Table 2. The results show that a number of farmers were sourcing their agro-inputs from nearby towns and cities (47.7%) before the introduction of VAAs and agro-input dealers within their community.

Table 2: Sources of agro-input supplies before and after introduction of VAA

| Sources of agro-input supplies | Before VAA introduction (%) | After VAA introduction (%) |
|---|-----------------------------|----------------------------|
| Nearby town or city | 47.7 | 44.2 |
| Agro-input dealer in the community or VAA | 46.0 | 55.8 |
| Others | 1.3 | 0 |
| From NGOs project | 5.0 | 0 |

Source: Field Survey, 2018

There were also some farmers (5.0%) who sourced their agro-inputs from NGOs who are operating in their locations. Others (1.3%) also sourced their agro-inputs from relatives or colleague farmers in the community. The introduction of VAAs has resulted in increased access to agro-inputs, by more than half (55.8%) of the farmers, near their communities as and when they need them. There is also the added value of reducing the potential cost of transportation if they had to travel to further locations to purchase their supplies. This also applies to OB input credit schemes and community input promotions.

Affordability

Farmers with VAAs in their communities were asked to compare current prices of agro-inputs before and after a VAA was established. The results are depicted in Figure 6 below. Majority of the farmers (57%) perceived no

change in prices of agro-inputs (improved seeds, fertilizers, weedicides, pesticides) before and after a VAA was established in the community. The results however also show that prices have not been a factor in the decisions not to purchase inputs for their farming operations.

Another 27.6% think agro-input prices have been rather higher, and 15.5% think prices are lower now with the establishment of VAAs. VAAs interviewed iterated that since they are operating for profits, they always make sure they factor in their profit margins. Even with their profits factored into the prices of agro-inputs, their prices are still better than what farmers would have paid should they purchase from in larger towns. The added value of reducing the potential cost of transportation is also a benefit here.

In the case of OB input credit schemes, all OGs interviewed mentioned that the prices offered by the OBs for inputs were like those offered by RADs in nearby towns. The OBs also provide an added advantage of giving the OGs the inputs on credit to be paid later with produce of crop being cultivated. Other OGs who had the capacity to pay also were given the opportunity to pay cash for their inputs.

Perceived Positive Effects of VAAs on Farming Business

Farmers were asked to indicate the positive changes that had taken place in their production activities because

Figure 6: Price comparison before and after VAA establishment

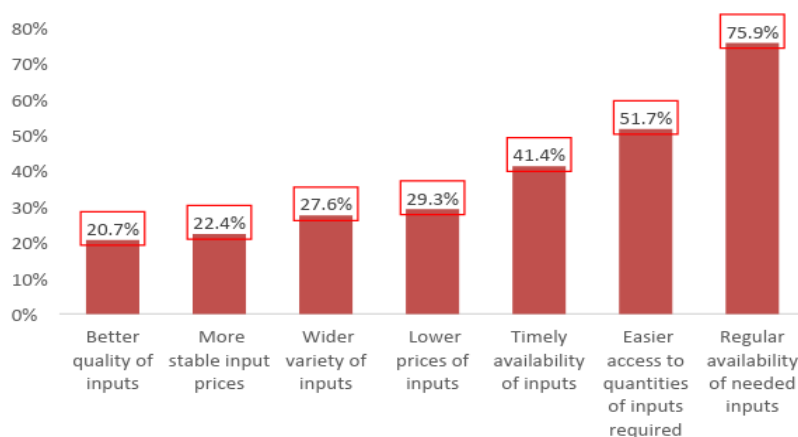
Source: Field Survey, 2018



of the operations of VAAs. The results show that there have been positive changes owing to the operations of VAAs. Key changes include regular availability of needed inputs (75.9%), easy access to quantities of inputs required and timely availability of inputs. Details are presented in Figure 7.

Figure 7: Perceived Positive Effects of VAAs on Farming Business

Source: Field Survey, 2018



Perceived Negative Effects of Seasonality of VAAs operations on Farming Business

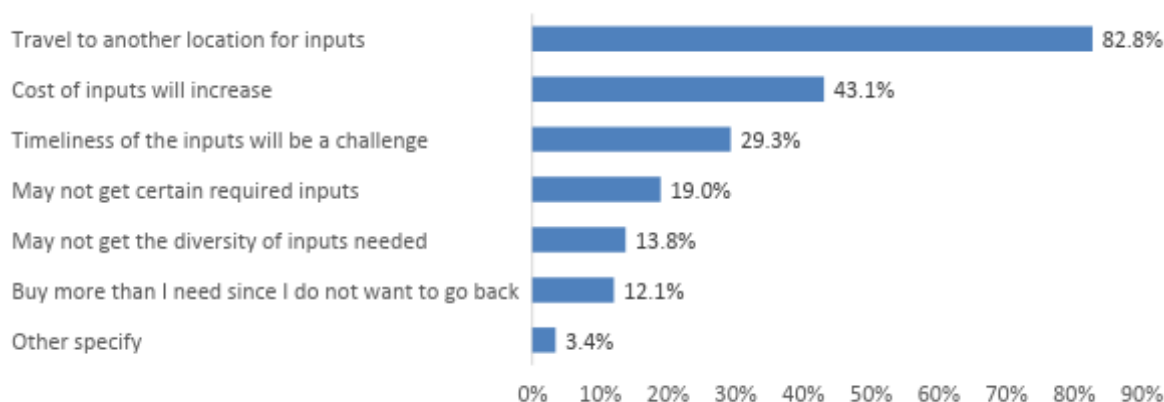
About 25.9% of the farmers mentioned that the VAAs in their communities do not operate throughout the whole year. Reasons given by farmers for VAAs inability to operate throughout the year include:

- Low demand for agro-inputs during the off-season (dry season);
- Family and personal reasons; and
- Lack of working capital to purchase agro-inputs.

Most of these farmers (82.8%) as shown in Figure 8 would have to travel to other communities to purchase agro-inputs and that agro-input prices will increase should the VAAs close operations during the off season. Some farmers to minimize the effect of the seasonality of VAA operations, suggested buying more than what is required in order to reduce transportation costs and to have inputs on time when required.

Figure 8: Perceived Negative Effects of VAAs on Farming Business

Source: Field Survey, 2018



There are wider implications of seasonality of the operations of VAAs. Most farmers who have irrigation facilities like to take advantage of dry season production of fruits, vegetables and other annual crops which are high value and profitable to produce. Dry season production is becoming important. They either have to purchase their requirements during the main growing season for later use, or may have to go to the major towns

and cities for their supplies, with the consequent additional transportation cost and inability to come up with the funds for procuring the supplies

Training in Agro-Input Use

Most (82%) of the farmers (81.6%) received training in technical and business management from USAID’s ADVANCE.

Table 3: Training of farmers in agro input usage

| Indicators | % |
|--|------|
| USAID’s ADVANCE provided training in technical and business management | 81.6 |
| Availability of Public Extension Officers | 59.2 |

Source: Field Survey, 2018

About 59.2% of the farmers also mentioned the availability of public agriculture extension agents (AEAs) in their communities as depicted in Table 3. Activities of AEAs were also visible among farmers in Brong Ahafo, Northern, Upper East and Upper West Regions. Majority of female OGs interacted with also mentioned that the introduction of the SSPs has greatly aided them as they fall on them mostly to undertaken spraying services on their farms

3.2.3 PROFITABILITY OF ADOPTING THE PROPOSED COMMUNITY AGENT STRATEGY BY WHOLESALERS AND RETAILERS

The general isolation of rural farmers in the hinterland from markets makes marketing costs, transportation and transaction costs prohibitively high for most suppliers of inputs who operate in the larger towns and cities. This is especially true when distances to be covered to reach the hinterland with dispersed communities are far and along routes mainly accessible to foot traffic. Such a situation results in price increases of the inputs and consequent reduction in usage of inputs. It is for this reason that these input dealers have adopted the strategy of selecting and engaging community-based input agents who sell their products in the communities, so the farmers do not have to travel long distances to access the inputs they require. When demand for inputs is high, resulting from a program such as the USAID’s ADVANCE project, and other government projects, the perceived demand for inputs is high making it interesting for input dealers to explore and supply those new markets because of the profitability and motivation.

Majority of RADs that were interviewed mentioned that the VAA strategy is a good strategy for them as it increased their sales between 12% and 67% annually. It provided them access to farmers in communities that would have been left not catered for had it not been for the VAAs. All eight RADs interviewed indicated that they supply inputs to the VAAs upon receipt of payments for delivery of inputs. They give the VAAs opportunity to operate as business entities by allowing them to determine their profit margins on the various inputs supplied. Averagely RADs adopting the VAA strategy have increased their sales a minimum of 12% and a maximum of 67%. Based on the returns and profitability of this strategy, two RADs that were interviewed mentioned they would be selecting representatives to be VAAs for new communities that they intend to venture into.

All these motivations are not without challenges; the RADs mentioned that they had a few challenges with the VAAs regarding payback of goods received and sold to farmers. VAAs can either be loyal or disloyal based on the business relationship the AID establishes with them. As such, RADs prefer to work with trustworthy community members with whom they already have a relationship or persons who have been referred by elders of the community.

3.2.4 EFFECTIVENESS AND EFFICIENCY OF THE VARIOUS PROJECT STRATEGIES TO PROMOTE FARMERS' ACCESS TO AGRO-INPUTS

The project's strategies, including community input promotions, availability of credit through the OB, organization and capacity building of direct retailers and VAAs, as well as, the training of farmers in the use of productivity-improving inputs and technologies, have all resulted in increased demand as well as access to these inputs and technologies. Other strategies promoted include the VSLAs' share out input promotions and commercialization of safe spraying service provision. Effectiveness of the project strategies has been demonstrated from the observations that the project is doing the right things and implementing the right strategies. Furthermore, these strategies, which are complimentary, are adequate to accomplish the objectives of the project to promote farmers access to inputs and productivity-enhancing technologies and are producing the intended and expected results. The efficiency of the project's strategies (community input promotions, OB input credit schemes, VAA operations, VSLAs' share out input promotions, and SSP operations), as depicted by the relationships established in the OB model, has also been demonstrated in the increase in productivity of the smallholder farmers being supported by the project. These strategies are very organized and are being implemented in the right way and majority of respondents confirmed that the project strategies have increased their access to agro-inputs compared to the past. The table below attempts to rank the input strategies based on respondents' views.

Table 4: Rankings of ADVANCE Input Strategies

| Strategy | OGs Accessibility | Timeliness | Affordability | Quality | Total Score | Rank |
|----------------------------------|-------------------|------------|---------------|-----------|-------------|-----------------|
| Community Input Promotions | Very High | Average | High | Very High | 17 | 4 th |
| OB Input Credit Schemes | High | High | Very High | Very High | 18 | 2 nd |
| Village-level agri-input agents | High | Very High | Very High | Very High | 19 | 1 st |
| Buyer – Outgrower Input Schemes | High | Average | Low | Average | 12 | 6 th |
| Spraying Service Provision (SSP) | Average | High | High | Very High | 16 | 5 th |
| VSLAs Share-Out Input Promotions | Very High | High | High | Very High | 18 | 2 nd |

Rankings: Very High – 5, High – 4, Average – 3, Low – 2, Very Low – 1

Majority of respondents confirmed that the OB input credit schemes have increased their access to agro-inputs compared to the past. According to respondents, OB's and FBO's provide agro-inputs to support prior to the commencement of the farming season which reduces their stress of accessing inputs at the right time. Some of the farmers affirmed that, the project strategies have resulted in avoidance of delays in accessing farm inputs. An OG in Labarega, Adamu Amini mentioned *“previously I had to travel to Tamale in search of non-available inputs but now, my OB rather transports the inputs to my community and distributes it to us without any challenges.”*

Comparatively there is a marginal change in accessing agro-inputs in terms of timeliness, payment, affordability and quality of products due to the OB financing and VAAs' strategy introduced by USAID's ADVANCE. Input dealers find the community input promotions to be a good opportunity to increase their sales and establish relations with OBs and their farmers who do not have easy access to their stores. It also constitutes an occasion to raise the interest of and to enroll potential community retailers and agents that could sell their products to farmers in these more remote communities (USAID's ADVANCE Project - FY16 Annual Report).

“Previously before we could access agro inputs, we had to pay cash and so those of us who could not raise money at the right time suffered delay of accessing the agro inputs but now due to the project’s strategies, majority of us are able to obtain the inputs on credit and pay at flexible terms from our OBs”; according to Dajan Bayong Sufyan from Bugubelle. The matrix below attempts to analyze the efficiency and effectiveness of each strategy based on OGs and OBs views,

“Previously I had to travel to Tamale in search of non-available inputs but now, my OB transports the inputs to my community and distributes it to us without any challenges.”

Farmers reported changes in accessing agro-inputs in terms of timeliness, payment, affordability, and quality of products due to the OB financing and VAAs’ strategy introduced by USAID’s ADVANCE. Input dealers find the community input promotions to be a good opportunity to increase their sales and establish relations with OBs and their farmers who do not have easy access to their stores. It also constitutes an occasion to raise the interest of and to enroll potential community retailers and agents that could sell their products to farmers in these more remote communities (USAID’s ADVANCE Project - FY16 Annual Report).

“Previously, before we could access agro inputs, we had to pay cash, and so those of us who could not raise money at the right time suffered a delay in accessing the agro inputs. Now, due to the project’s strategies, a majority of us are able to obtain the inputs from out OBs on credit and are able to pay at flexible terms,”

explained Dajan Bayong Sufyan from Bugubelle. The matrix below analyzes the efficiency and effectiveness of each strategy based on OGs and OBs views.

Table 5: USAID’s ADVANCE Input Strategy Matrix

| Strategy | OGs Accessibility | Timeliness | Affordability | Quality |
|----------------------------|--|--|---|--|
| Community Input Promotions | Majority of respondents iterated that the inputs are readily available whenever the RADs are organized to supply the communities | Though OGs eventually receive their inputs, the timings have mostly been wrong. Several OGs did not receive all the inputs required on or before planting time. Others received inputs like fertilizers months after planting which made them miss the right time for the application of inputs. | Despite some complaints about the high prices of inputs received, an overwhelming majority of OGs attest to the affordability of inputs compared to the open market in relation to the payment terms. | OBs and OGs confirmed that the inputs supplied are of high quality, and the results have always been positive. |
| OB Input Credit Schemes | Most OGs, especially the women, claimed easy access to | It was revealed that OBs inputs based on credit | Input credits from OBs are considered by OGs as very | A majority of respondents trust the quality of input credit |

| Strategy | OGs Accessibility | Timeliness | Affordability | Quality |
|----------------------------------|--|--|---|--|
| | credit facilities from OBs in support of their farming activities. | were supplied to farmers on time. | affordable compared to the open market and they also offer flexible payment terms. | facilities received based on yields at the end of the season. |
| Village-level agri-input agents | OGs confirmed that the VAAs are always available at the beginning of the farming season. | Most OGs confirmed that most of the VAAs provide timely services. | Inputs from VAAs were confirmed by OGs as very affordable. | Inputs provided by VAAs were confirmed by respondents as of very high quality. |
| Buyer – Outgrower Input Schemes | OGs revealed that inputs are highly available after signing of contracts. | Respondents revealed a delay in receipt of services from buyer-outgrower schemes which affects the production cycle. | Inputs from buyer-outgrower input schemes are more expensive compared to the prices on the open market. There is also the added responsibility of crop insurance and other charges which also increases the repayment quantities. | Most OGs could not guarantee the quality of inputs from outgrower input schemes. OGs argue that sometimes their inputs are of higher quality, and sometimes they are of poor quality. Sometimes inputs work effectively during demonstration but fail on their fields. |
| Spraying Service Provision (SSP) | The number of SSPs are inadequate and making the accessibility of spraying services sometimes challenging. Female OGs have benefited greatly from the SSPs mostly because they (women) are not exposed to the hazardous chemicals, | Available SSPs always spray on time especially in incidences of FAW. | Comparatively, spraying services provided by SSPs are cheaper (cost effective) when compared to open market services. Group members pay less for services compared to non-members. | OGs trust the quality of services provided by SSPs. Farmers believe that they are well trained and will perform their functions effectively. |
| VSLAs Share Out Input Promotions | Input promotions after VSLA share-outs are highly accessible to members. | Share-out inputs are provided on time in most cases according to respondents. | Inputs are considered by OGs as affordable compared to the open market. | Most farmers confirmed that inputs are always of high quality. |

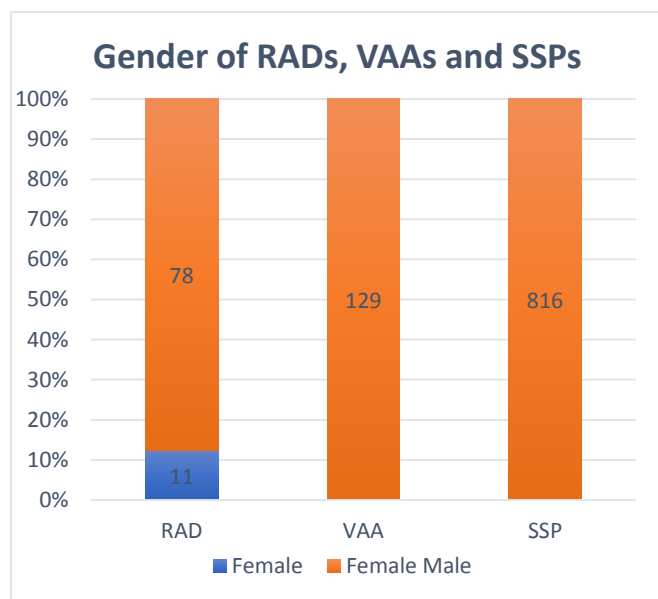
| Strategy | OGs Accessibility | Timeliness | Affordability | Quality |
|----------|---|------------|---------------|---------|
| | According to respondents, the inputs are brought to the share-out centers for collection by members through the arrangements of their leaders, which makes it easy for OGs. | | | |

3.2.5 CATEGORY OF PERSONS INVOLVED/WILLING AND THE CONSTRAINTS INVOLVED IN THE INPUT BUSINESS EXPANSION

Generally, a VAA is a locally based entrepreneur who, in addition to farming and trading in other commodities sells seeds, fertilizer and agro-chemicals to poor farmers in remote areas. It is anticipated that in an input business scenario, a network of small-scale, entrepreneurial agro-dealers would transform the currently fragmented input distribution system into an efficient, commercially viable input infrastructure which would in turn enable farmers to have greater access to productivity enhancing inputs and technologies. The selection of VAAs by agro-dealers depends primarily on the knowledge of prospective candidates, or those who have been recommended by community elders, OGs or other operating VAAs who can vouch for such a person. This is important because the agro-dealers have to employ this strategy to reduce bad debts. There are, however, various constraints that impede input business expansion.

Figure 9: Gender of RADs, VAAs and SSPs

Source: ADVANCE Database 2018



The study revealed a male dominance in the input business within the entire study areas. This is largely because establishment of the agro-input dealership is based on investor choice and availability of capital to invest. Generally, women are rarely connected with agro-inputs trading, they are mainly involved in the production, processing and trading of food crops including maize, rice, and soya (Mtsor & Idisi, 2014). Majority of the RADs are between the ages of 35 and 50 years. The few youths involved in input dealerships are thriving but need business management and administration support. All VAAs and SSPs on the project are males. The project strategy was to target males to prevent exposing females particularly to the hazardous chemicals associated with input dealership operations. The input business is dominated by educated people who can read and write with the less educated ones in the rural areas. Several people are willing to enter into the input business but remain unsure of the operations involved. The few youths identified in the communities, who

expressed interest, mentioned that they would appreciate if they could benefit from any training that would let them understand the operations of the input business. According to them they do not have the time to spare

to serve as apprentices in an already established shop as remuneration is not enough and they also have to tend to their farming and other businesses.

For constraints for both RADs and VAAs, poor access to low interest loans remains a major hindrance to the expansion of the business. Average interest rates from available banking and financial institutions are between 27.5% to 45% per annum. According to Banaawaa Enterprise in Jirapa, *“we can get loans, but the interest rates are too high and so if care is not taken you will lose all your capital and so this makes it difficult in expanding the business.”*

Another challenge is the delay in supply of the inputs by their suppliers. *“Sale of inputs is time and season bound, once you make payment to a supplier and he/she delays in delivery, it affects sales because most farmers would not buy inputs if the season passes. I sometimes pay money to major suppliers and they delay in supplying and so it becomes a debt if the inputs do not sell fast. For instance, I have paid about GH¢10,000.00 for fertilizers and the supplier failed to deliver, at the time the materials were ready the season was over and so I had to tell the supplier to keep the product. Such issues affect sales and expansion”*; according to Banaawaa Enterprise in Jirapa.

“We can get loans, but the interest rates are too high. If care is not taken, you can lose all your capital, making it difficult to take out a loan to expand business operations.”

Another challenge reported by RADs and VAAs is the delay in supply of the inputs by their farmers.

“Sale of inputs is time and season bound. Once you make payment to a supplier and here is a delay in deliver, it affects sales because most farmers would not buy inputs if not in season. I sometimes pay money to major suppliers and they delay in supplying, and so it becomes a debt if the inputs do not sell fast. For instance, I paid about GHS10,000 (\$2,000) for fertilizers and the supplier failed to deliver before the season was over. I had to tell the supplier to keep the product. Such issues affect sales and expansion,” Banaawaa Enterprise in Jirapa.

3.2.6 GENDER DIMENSIONS OF INCREASED ACCESS TO AND USE OF AGRO-INPUTS, INCREASED CAPACITY OF DECISION MAKING, INCREASES SOCIAL CAPITAL AND LEADERSHIP IN THE COMMUNITY, TIME AND ENERGY SAVING ASPECTS, ETC.

Although women are the backbone of the rural economy and dominant in farming and processing of agricultural produce in Ghana, they are often marginalized, when it comes to access to technical support, input, land, credit and training assistance by both government and private institutions. It is important, therefore, to empower and invest in rural women when projects are being implemented since even a slight improvement in the assistance they receive, will have a significant effect on productivity, incomes, health and overall livelihood of the rural household. It goes a long way to benefit women in terms of time, energy and labor savings (FAO, 2011).

From interactions with OBs, it was revealed they prefer to work with females than males because they consider them to be more credible as compared to their male counterparts. According to them, females always pay back inputs received as compared to the males as they are afraid to incur debts. Females also ensure that whatever inputs are received are used for the intended purpose. The males most often than not will not use all inputs especially fertilizers for their farms; they would rather sell off some of their inputs. This has increased female access to and use of inputs in support of their farming activities. Also, the share-outs of the savings mobilized from the various VSLAs are scheduled before or to coincide with community input promotions, so that as OGs (dominated by females) take their savings they are able to pay for the required inputs. Similarly, the study revealed high female participation in the VSLAs which have now provided a beacon of financial hope to majority of women in farming. According to the group members, women are flexible, easy to work with and easy to recover their loans than men. Elder Richard Akoka of Navorongo attested to this by saying, *“I have more female OG’s as an OB because the women are flexible and credit worthy, and this has made the men in the community not happy with me.”*

The establishment of SSPs (to provide services to women groups and female SHFs who are discouraged from direct use or contact with pesticides), VAAs and community input promotions have greatly ensured women have access to usage of agro-inputs to increase their productivity. From the women's focus group discussions, various participants mentioned how their inclusion in the project's training to empower them and to increase the production and productivity of their operations has strengthened their networks, shared sense of identity and understanding, trust and cooperation among themselves in their communities. They also intimated that their leadership and decision-making skills have been built, making them capable of controlling their day-to-day lives in their homes and in the community, at large. The social status of majority of women in the communities has risen due to their financial contribution to the upkeep of the family. Before USAID's ADVANCE project most women used to rely on their husbands for almost everything which made their husbands overburdened by financial pressure. But now, due to the VSLA they are able to raise capital to support the family which brings joy and happiness at home and now they are empowered to take decisions that affect them and the household because of their control of resources. Women in Gbare mentioned the following "*the men no longer stretch their hands on us again because we now farm and cater for the home, we have money from the box to support the family.*"

3.2.7 CURRENT STATUS OF YOUTH ENGAGEMENT, BARRIERS AND STRATEGIES TO ENHANCE THEIR INVOLVEMENT

It is essential that we engage with and encourage youth to consider careers in agriculture because ensuring food security is a growing issue in Ghana, Africa, and the rest of the world. There are also burgeoning numbers of youth, including girls, coming out of school each year without any prospect for decent employment. At the same time, there is a huge need for small- and large-scale farmers to build sustainable agribusinesses to support economic growth. This situation provides a great opportunity for youth to build their skills and find exciting, relevant work in agriculture, while also making a difference to the future food security concerns (FAO, 2014). Finally, for continuity, the commercial farming sector must engage in sharing knowledge and skills with the emerging youth farmers to sustain agricultural production.

Despite the project's positive impacts, the number of youths engaged in farming remains very low, as shown by the demographics of the target populations surveyed (Figure 2 above). According to Richard Akoka, an OB,

"The low youth participation rate is because they have little interest in farming and its related agribusinesses. We've tried involving youth through trainings and support, but most of them are not interested, citing various barriers to their entry into agriculture."

Barriers Facing the Youth

Although farming and engagement in agribusiness enterprises by the youth could be rewarding and profitable, there are several barriers that prevent them from engaging in agriculture. Misconceptions about working in agriculture have long dis-incentivized young people opting for a career in agriculture. The youth are often discouraged by the image of punishing work and poor, weather-beaten farmers and the long dry season when not much farming is done, except by those with irrigation facilities. The youth believe agriculture is still an old-fashioned industry; farming is for those who could not further their education which makes attracting youth to agriculture very difficult. High barriers to entry, particularly when it comes to the capital needed to set up and operate large tracts of farming land, low profitability, and the perceived high risk are also recognized (Conway, 2014).

Other barriers include, access to land, functional literacy and numeracy, social networks and entrepreneurial confidences, selection processes (leaving out youth and women and vulnerable individuals) (ACDI/VOCA, 2016) and access to green jobs and markets and no and/or less engagement in policy dialogue (FAO, 2014).

Without recognizing and addressing these barriers, some programs are not only less inclusive but might also inadvertently cause harm.

Strategies to Attract the Youth into Agriculture

Various strategies have been proposed to attract the youth into agriculture. Presently, access to technology, information and better communication tools, coupled with immensely improved equipment (drones, smart phones to set irrigation systems and computers in planters for precision row crop soil preparation, planting and harvesting), are enabling farmers and agri-experts to change the way we think about youth in agriculture and to improve how to engage them in the industry. Conway (2014), suggested a more comprehensive approach in making agriculture more attractive to younger generations:

1. *Link social media to agriculture:* The rise of social media and its attraction among young people with access to the appropriate technologies could be a route into agriculture if the two could be linked in some way. Mobile phone use in Africa is growing rapidly and people are now much more connected to sources of information and each other. Utilizing these channels to promote agriculture and educate young people could go a long way in engaging new groups of people into the sector.
2. *Improve agriculture's image:* Farming is rarely portrayed in the media as a young person's game and be outdated, unprofitable and hard work. Greater awareness of the benefits of agriculture as a career needs to be built amongst young people, in particular opportunities for greater market engagement, innovation and farming as a business. The media, ICT and social media can all be used to help better agriculture's image across a broad audience and allow for sharing of information and experiences between young people and young farmers.
3. *Strengthen higher education in agriculture:* Relatively few students choose to study agriculture, perhaps in part because the quality of agricultural training is mixed. Taught materials need to be linked to advances in technology, facilitate innovation and have greater relevance to a diverse and evolving agricultural sector, with a focus on agribusiness and entrepreneurship. Beyond technical skills, building capacity for management, decision-making, communication and leadership should also be central to higher education. Reforms to agricultural tertiary education should be designed for young people and as such the process requires their direct engagement.
4. *Greater use of Information and Communication Technologies (ICT):* Not only can ICT be used to educate and train those unable to attend higher education institutions, but it can be used as a tool to help young people spread knowledge, build networks, and find employment. Catering to a technologically savvy generation will require technological solutions. Such technologies can also reduce the costs of business transactions, increasing agriculture's profitability.
5. *Empower young people to dialogue on opportunities in agribusiness:* If we are to enable youth to transform agriculture then the barriers to their engagement, such as access to land and finance, need to be addressed. National policies on farming and food security need to identify and address issues facing young people. As such youth need to become part of policy discussions at the local and national levels, whether as part of local development meetings, advisory groups or on boards or committees. There needs to be a platform for young people to discuss opportunities in agricultural development, share experiences and advocate for greater youth engagement and representation.
6. *Facilitate access to land and credit:* Land is often scarce and difficult to access for young people, and without collateral getting credit to buy land is nigh on impossible. Innovative financing for agriculture and small

businesses is needed. For example, soft loans provided to youth who come up with innovative proposals in agriculture or micro-franchising.

7. *Put agriculture on the school curricula:* Primary and high school education could include modules on farming, from growing to marketing crops. This could help young people see agriculture as a potential career. Some organizations run projects aiming to help school children discover more about agriculture as a profession.
8. *Undertake greater public investment in agriculture:* Young people may see agriculture as a sector much neglected by the government, giving farming the image of being old fashioned. Investment in agriculture is more effective at reducing poverty than investment in any other sector but public expenditure on agriculture remains low. Regional and continent-wide programs such as the Comprehensive Africa Agriculture Development Program (CAADP) may go some way in transforming the prominence and reputation of agriculture in Africa but national efforts and public investments are also needed.
9. *Make agriculture more profitable:* This is an easy statement to make but a difficult one to realize. Low yields and market failures in Africa reduce the potential of agriculture to be profitable and to provide people with a chance of escaping poverty and improving their quality of life. Making agriculture profitable requires that the costs of farming and doing business are reduced while at the same time productivity increases. Although large-scale commercial farming springs to mind, this is not necessarily the case, and small farms can be highly productive with low labor costs (Conway, 2014).
10. Additionally, while the youth migrate to the cities to escape rural or agriculture-related careers, equal emphasis should be placed on encouraging and enabling urban agriculture startups. Teaching young people to implement urban agriculture through a variety of modern methods and practices would not only improve their yields and income potential but also give them a sense of achievement and the self-confidence that they may be struggling to achieve through meaningful employment elsewhere (FAO, 2014).

3.2.8 RESULTS/IMPACTS FROM CROWDING IN FROM OTHER NON-SUPPORTED ACTORS AND THE IMPACT COMPETITION HAS HAD ON PROVIDING BETTER QUALITY SERVICES AND BUSINESS GROWTH

Majority of RADs interviewed mentioned that although they had competitors, this largely does not affect their sales, as every business within the market space has its customers that it supplies to. However, the competition has caused the RADs to ensure that they stock quality products all the time and win over customers of their competitors. When asked if they have any idea of the market share, they control, most of the RADs could not provide this information but they that they are in a profitable business during the season.

Based on the services provided by the OBs, a few of them have added on input dealerships. They take loans from banking and financial institutions to purchase and provide inputs to the OGs they work with. This has greatly increased their returns as they can purchase more and provide more support to the farmers.

3.2.9 REGULATORY CONSTRAINTS THAT INHIBIT EXPANSION OF INPUT DEALERSHIP AT THE COMMUNITY LEVEL

Ghana has regulations on the registration, distribution and usage of pesticides to evaluate their environmental and human health effects. Pesticide misuse, misapplication, contamination of the environment and human exposure still continue because of the dealers as well as users of agro inputs. There has been a shift to the use of relatively “safer” pesticide alternatives which gave birth to the implementation of the pesticide registration process of Ghana in 2003. The pesticide law at the time was the Pesticide Control and Management Act, Act

528 of 1996. The law has been consolidated to become Part II of the main Ghana Environmental Protection Agency (EPA) Act, Act 490 of 1994. This law includes the whole pesticide life cycle, and also the registration and procurement of pesticides, their import, distribution and retail to farmers, their monitoring for quality control and waste management (EPA-Ghana 2012).

The Ghana EPA is responsible for the registration of pesticides as well as their management. They do this to ensure that the pesticides are not banned ones, are not expired products, are properly labeled, distributed, stored, transported, used and applied by following the accepted procedures and processes. The Ghana EPA further monitors pesticide uses and, if needed, react against illegal use, and issues pesticides importation and user licenses (EPA-Ghana 2012).

Discussions with RADs and VAAs confirmed that in instances where OGs required small portions of fertilizers, weedicides and pesticides, they repackage smaller portions for them. If in the process of repackaging of inputs there is accidental spillage and the agent is exposed to pesticides, the lack of adherence to strict safety measures under section 44 (4) of the Act could lead to different health problems and is in violation of the Act. All RADs and VAAs interviewed, confirmed they do not wear protective clothing and nose masks when in their shops. They as much as possible try not to spend a lot of time in the shop but rather sit outside the shop to prevent them inhaling pungent odor from the agro-inputs. Not using protective clothing when handling agro inputs is also a clear violation of section 44 (1, 2 and 4) of the pesticides Act. All VAAs are operating without licenses. According to the RADs, their licenses cover the operations of the VAAs. EPA however iterated that the certificates of the input dealers does not cover the operations of the VAAs. As such VAAs who do not have a license are in violation of section 44 (4 and 5) of the Act.

These observations show that attention and necessary corrective interventions are needed to regulate the activities of VAAs and shows the difficulty in expanding the activities of VAAs without ensuring that their operations are not in contravention of the provisions of the Act. There is a need to regularize the legal status of VAAs if the strategy is to be maintained to meet the needs of rural farmers in the communities.

In the case of SSPs, all SSPs interviewed mentioned they also do not operate with licenses. Discussions with EPA staff revealed that once activities of the SSPs do not involve the purchase, transport, storage and retail of agro-inputs, they are not in violation of any section of the Act.

3.3 Assessment of the Impact of USAID's ADVANCE PROJECT Pest Management Strategy for Fall Armyworm

3.3.1 INTRODUCTION

Fall armyworm (FAW), or *Spodoptera frugiperda*, is an insect with origins from Central and South America, first identified in West Africa in January 2016. The pest is the larval form of the FAW moth and has an indiscriminate appetite, consuming 80 different plant species, including leafy crops and cereals, especially maize. The pest, from the *noctuidae* family, is a menace and threatens food security. The invasion of FAW in Ghana gives cause for concern, because the pests eat the plants' reproductive parts, through the cob in the case of maize, resulting in significant crop loss. Since mid-2016, FAW has infested several maize farms in Ghana and negatively impacted agricultural production.



Fall armyworm on a maize leaf

3.3.2 INTERVENTIONS

In collaboration with the Ministry of Food and Agriculture (MoFA), Food and Agriculture Organization (FAO), Centre for Agriculture and Bioscience International (CABI), Farm Radio International (FRI) and other stakeholders through the national taskforce; USAID's ADVANCE project adopted the following mitigation plan to control FAW:

- a. Collaboration with FAW national taskforce
- b. Education and awareness creation through field training, use of radio, posters, and call centers
- c. Field observations and pesticide observation plots' set up
- d. Field monitoring using pheromone traps (a type of insect trap that uses a secreted or excreted chemical factor that triggers a social response in members of the same species) and standard field tracking
- e. Pest management using safe spray service providers (SSPs) and low toxicity pesticide which are pesticide evaluation report and safer use action plan (PERSUAP) compliant.

3.3.3 EFFECTIVENESS OF THE MEDIA CAMPAIGN ON THE KNOWLEDGE OF TARGET BENEFICIARIES ON FAW

As part of the FAW mitigation plan, the USAID's ADVANCE project, has trained over 200 agriculture extension professionals including project staff, MOFA staff and partners to provide education and create awareness through field training, use of radio, posters, and call centers.

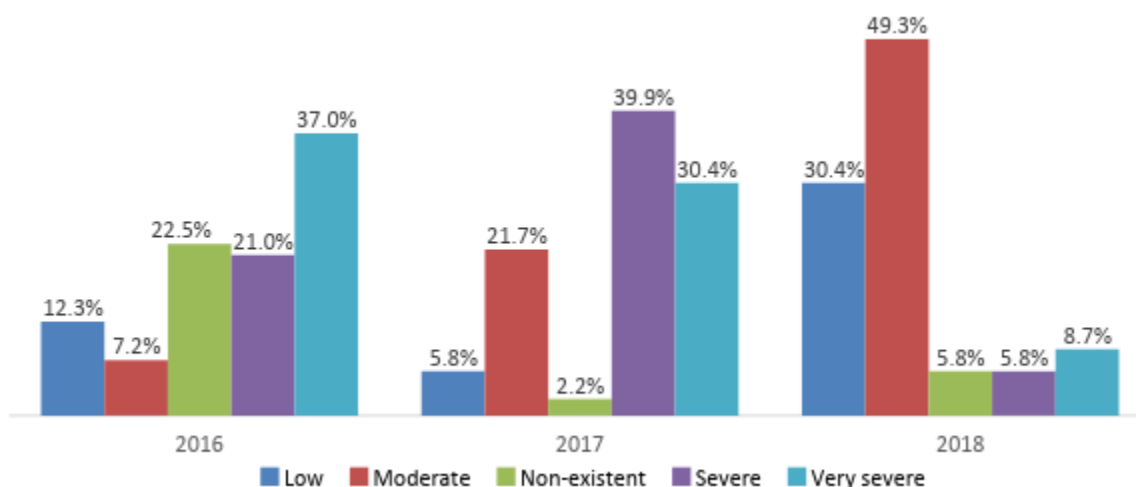
The first discovery of FAW in farmers' community was 2015. This was reported by 15 out of 137 representing 11%. By 2017, more than 98% of the farmers reported FAW was discovered in their community. This goes to show the extent the FAW affected farming communities. Year of the first discovery of FAW in the community was found to be linked to one's region of abode. For instance, all the farmers in the Ashanti region mentioned they first discovered FAW in 2016 in their communities while the other regions had more than 96% of the farmers experiencing FAW in their communities only in 2017. A total of 136 out of 147 responded to their knowledge of FAW.

Effects of FAW on Farmers Crop

Figure 10 depicts the trend of the severity of FAW in farmers' community. Farmers who reported the severity of FAW in their communities increased from 58% in 2016 to 70% in 2017.

Figure 10: Trend of Severity of FAW in the communities

Source: Field Survey, 2018



In the following year, however, farmers who reported the severity of FAW in their communities decreased to 14%. The decrease is attributed to the consistent monitoring of fields to identify FAW infestation to control them and as a result of the change in the rainfall pattern as it rained more in 2018 compared to 2016 and 2017.

Farmers Source of Information about FAW

When FAW was first identified as a serious problem, about 63.8% of the farmers reported receiving relevant information about FAW before the subsequent season. More female farmers (72.3%) received relevant information than male farmers (56.2%).

Table 7: Farmers Sources of Information about FAW

Source: Field Survey, 2018

| | |
|-------------------|-------|
| USAID's ADVANCE | 84.5% |
| MOFA | 61.5% |
| Radio/TV | 52.3% |
| District AEs | 42.2% |
| Colleague Farmers | 22.6% |
| Other NGOs | 21.4% |

Out of the 36.2% who did not receive relevant information about FAW before the subsequent season, 72.0% recounted their crop losses to FAW the first time it was identified in their community. About 68% mentioned that the information received before the cropping season was helpful. The main sources of information for the farmers include USAID's ADVANCE (84.5%), MOFA (61.5%), Radio/TV (52.3%) and district AEs (42.2%). USAID's ADVANCE mode of information in reaching farmers were mainly through posters (57.3%), radio broadcast (52.2%) and radio jingles.

During the media campaign, farmers educated on the following FAW-related topics:

- What the FAW is
- Why it is dangerous?
- When it attacks
- Which part of the plant it attacks?
- How it affects crops
- Different methods to control it
- Sources of information and assistance on FAW

Table 8: USAID's ADVANCE Mode of Information to Farmers

| | |
|-----------------|-------|
| Posters | 57.3% |
| Radio broadcast | 52.2% |
| Radio Jingles | 48.5% |
| Fliers | 29.1% |
| TV | 11.7% |
| Other | 18.7% |

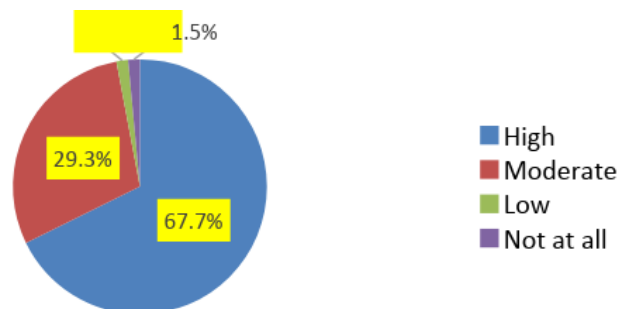
Source: Field Survey, 2018

Control of FAW was generally through spraying the farms with appropriate insecticides such as Bypel, Emastar and Attack. Farmers were further asked how often they receive information on FAW. About 32.9% of the farmers receive information on FAW every day. Additional 30.8% receive information on FAW weekly and 17.8% receive information on FAW monthly.

Effectiveness of Information received on FAW Control

Figure 11: Extent information provided on FAW helped to protect farmers’ maize

Source: Field Survey, 2018



More than 95 percent of farmers reported that the FAW information they received helped in protecting their maize crops.

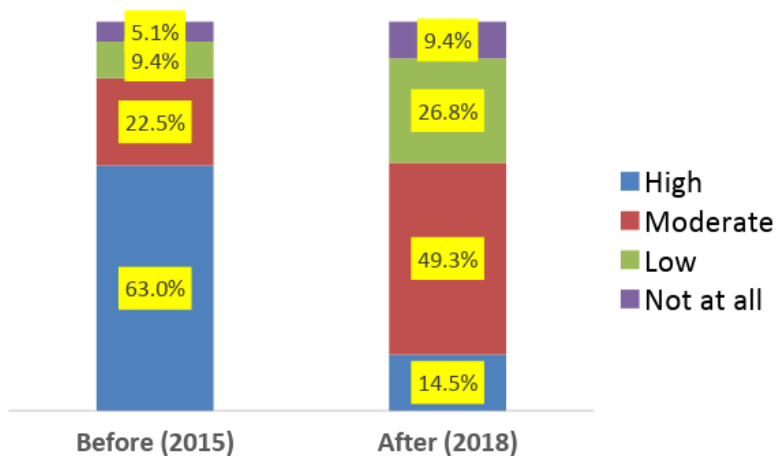
Of the 95% farmers that mentioned the information they received helped in protecting their maize crop, 67.7% of those respondents considered it to a high extent. Of the remaining respondents, 29.3%

and 1.5% found the information to a moderate and low extent beneficial respectively. Only 1.5% found the information not to be beneficial at all.

The study also sought to assess the impact of a media campaign on FAW attack on farmers maize yield. The media campaign was organized in 2017 and 2018. Farmers were asked the extent of FAW attack

Figure 12: FAW Attack on farmers maize yield before and after a media campaign

Source: Field Survey, 2018



on their maize yield before and after the media campaign. The findings are presented in Figure 11.

About 63% of the farmers mentioned before the media campaign FAW attack reduced their yield highly. This proportion of farmers reduced to 14.5% after the media campaign. Moreover, farmers who experienced the low impact of FAW attack before the media campaign had increased from 9.4% to 26.8% and those with no attack before the media campaign increased from 5.1% to 9.4%. Deriving from the above,

the media campaign was effective in controlling FAW. This was supported by general comments from the farmers:

- Information provided was very helpful (85.5%)
- In spite of improved knowledge of the FAW farmers had limited resources (appropriate agro-chemicals) to implement the recommendation provided (29.0%) as USAID’s ADVANCE did not advice on the specific chemical to use in controlling FAW.

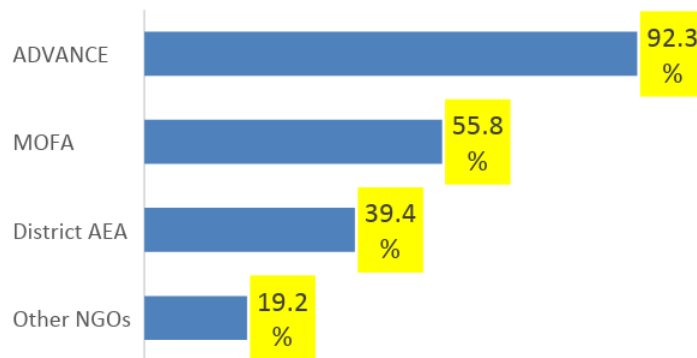
3.3.4 EXTENT TO WHICH THE BENEFICIARIES WHO WERE TRAINED SHARED THEIR KNOWLEDGE WITH OTHER FARMERS

This section covers training received by farmers and the extent beneficiaries of the FAW training shared their knowledge with other farmers.

Training Received on FAW by farmers

Figure 13: Who Provided Training on FAW

Source: Field Survey, 2018

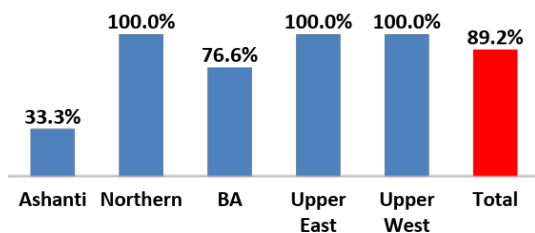


A total of 104 out of 138 farmers (75.4 percent) received training on FAW management.

FAW management training started training in 2015 (6.7 percent). In 2016, 35.6 percent participated in FAW management training, and in 2017, participants increased astronomically to 78.8 percent—an increase of 43.2 percent. The analysis further shows that about 48 percent of FAW management training beneficiaries participated in more than one FAW management training. Figure 13 shows the percentage of farmers which each organization trained. Most of the farmers (92.3 percent) received FAW management training from USAID’s ADVANCE.

Additionally, MoFA trained 55.8 percent, district AEAs trained 39.4 percent, and NGOs trained 19.2 percent. All the beneficiaries found the FAW management training useful.

Figure 14: Knowledge of FAW Management Training shared with



Knowledge of FAW shared with other farmers

Within the community, 78 percent of farmers depend on the experience of other farmers for advice on managing pests and diseases. Knowledge of FAW management training shared with farmers is presented in Figure 14. The results show that 89.2 percent of the total beneficiaries shared knowledge of FAW management training with farmers.

The results further show that 100 percent of FAW training beneficiaries in Northern, Upper East, and Upper West regions shared their knowledge with other farmers in the community.

The key information shared with farmers is presented in Figure 15. Most of the beneficiaries shared why FAW is dangerous (82.2 percent) with other farmers.

How farmers shared information



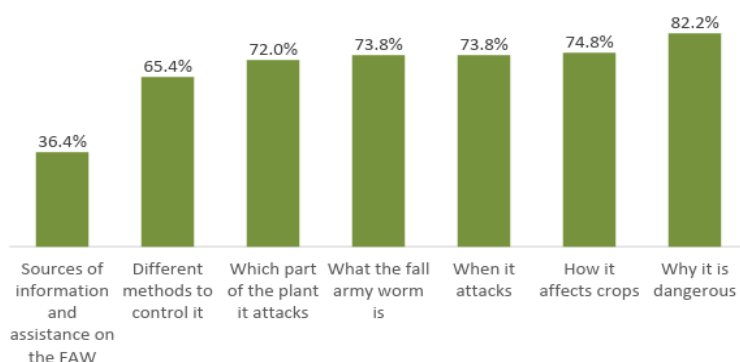


Farmers also shared how FAW affects crops (74.8 percent) and when FAW attacks (73.8 percent). The least shared information was sources of FAW information and FAW assistance. On average

each farmer shared information with 10 farmers.

Figure 15: Key information on FAW shared with Farmers

Source: Field Survey, 2018



3.3.5 CONTRIBUTION OF THE FALL ARMY WORM CALL CENTER TO THE EFFECTIVENESS OF THE FAW MANAGEMENT STRATEGY

The project acquired three call numbers with WhatsApp (0266222002, 0577662000, and 0201212121) printed on the posters for farmers to call or send a message and picture through WhatsApp for technical advice. From May 2017 to May 2018, the call centers received 537 calls from 515 men and 22 women. From the result of the survey, the FAW call center did not contribute much to the effectiveness of the FAW management strategy. Only a few farmers (4.3%) ever called the FAW call center. These farmers were from Brong Ahafo (9.1%), Upper West (4.5%) and Northern (1.7%) regions and members of VSLA groups. Most of these callers (66%) had called the FAW call center at least twice. The remaining 34% had either called once (17%) or three times (17%). The main information farmers sought from the call center was how to control the FAW. All the farmers who called the FAW call center unanimously accepted that the information received was useful and 83.3% were able to apply the information they received from the call center. (See Table 9 for more details).

The enthusiasm getting information on the FAW from the call center waned a bit because people were seeing the positive results of the program strategies and so complacency has set in. It is necessary to maintain the momentum even in the face of reduced infestation.



Table 9: Contribution of FAW call center to the management of FAW

| Indicator | Results |
|--|--------------------|
| % of farmers ever calling FAW call center | 4.3% |
| Mean number of times farmer called FAW call center | 2 |
| Main information required from the call center | How to control FAW |
| Usefulness of information received from FAW call center (%) | 100% |
| % of farmers able to apply the information received from the FAW call center in farming activities | 83.3% |

Source: Field Survey, 2018

There is also a need to monitor the situation as natural enemy populations might have accounted some of most of the reduced infestation. Continued monitoring will validate the primary reason for the reduction of FAW infestations.

3.3.6 MAJOR CONSTRAINTS TRAINED AGENTS FACED IN SUPPORTING SMALLHOLDERS TO MANAGE FAW

The agents who received training on FAW were tasked to support smallholder farmers in managing the FAW. These agents faced many constraints which affected their ability to assist the farmers, including:

- *Unavailability of smallholder farmers for training during the season:* The agents mentioned that sometimes when they call community meetings to educate farmers on FAW, community members do not turn up for the meeting. Unless the timing was thoroughly discussed with them most of them will rather prefer to be on their fields than to come for the meetings.
- *Lack of logistical and other resources to organize the training:* In other cases, they do not have the resources to organize the meetings. These resources include batteries to power their megaphones to announce meetings, fuel to travel from their cottages to the community centers, etc.
- *Limited access to recommended pesticides:* Discussions with the trained agents revealed that the recommended pesticides are scarce on the market.

Table 10: Major constraints trained agents faced

| Constraints | Frequency |
|--|-----------|
| Unavailability of smallholder farmers for training during the season | 10% |
| Lack of logistical and other resources to organize the training | 32% |
| Inability to locate the sources of recommended pesticides | 16% |
| Limited access to recommended pesticides | 42% |

Source: Field Survey, 2018

The major challenges were limited access to recommended pesticides (42%), Lack of logistical and other resources to organize the training (32%), Inability to locate the sources of recommended pesticides (16%) and unavailability of smallholder farmers for training during the season (10%). The other challenges and their representation are shown in Table 10.

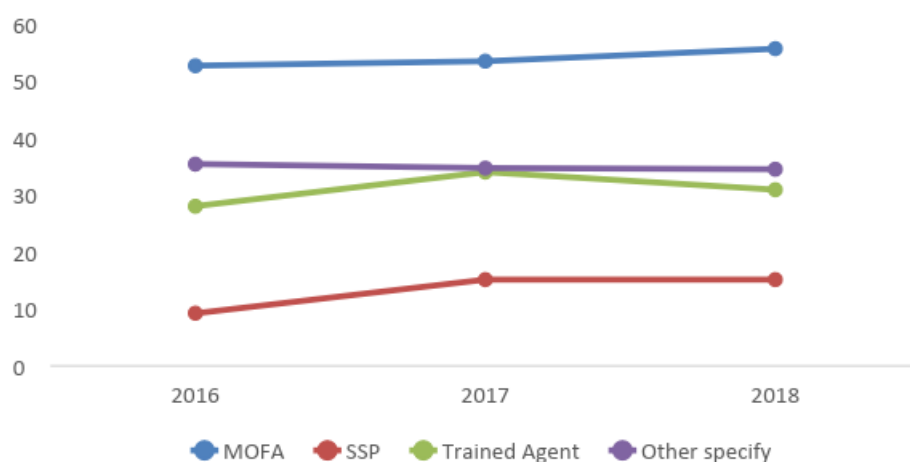
Respondents of the qualitative survey also identified a few constraints. The major ones were lack of logistical resources to organize training for farmers and limited access to recommended pesticides that they should procure for treating their maize crop. Focus group discussions and key informant interviews revealed that factors such as delay in the distribution of recommended chemicals for training, availability of sufficient quantities of recommended pesticides, funding, mentoring, monitoring and evaluation of their work are also impeding the work of the trained agents

3.3.7 HOW FARMERS ARE EQUIPPED TO DEAL WITH A FUTURE OUTBREAK OF FALL ARM WORM, OTHER PEST EMERGENCIES, AND GENERAL PEST MANAGEMENT

The study sought to determine the capacity of farmers to deal with a future outbreak of FAW, other pest emergencies, and general pest management. Farmers were asked where they obtained assistance in controlling

Figure 16: Source of Assistance in Controlling FAW

Source: Field Survey, 2018



FAW. Figure 16 shows that from 2016 to 2018, MoFA was the main source of assistance (knowledge to identify FAW, monitoring impact on crops, and FAW mitigation, etc.) to farmers in controlling FAW. This was followed by other sources such as USAID’s ADVANCE and farmers own knowledge.

According to the survey, about 87 percent of farmers have the necessary information to

deal with FAW and other pest emergencies.

Table 11: Knowledge about FAW to apply in case of a future outbreaks

| Knowledge about FAW to apply in case of a future outbreak | % |
|---|-------|
| Ability to identify FAW Attack | 82.8% |
| Awareness and understanding of FAW | 75.4% |
| Timely application of pesticides | 56.7% |
| Effect of the seasons on FAW Attack | 54.5% |
| Knowledge of various types of pesticides | 43.3% |
| Sources of information on FAW and other pesticides | 41.0% |
| Sources of agrochemicals to control pests | 38.8% |
| Correct application of pesticides | 38.1% |
| Safe handling, storage, and use of pesticides | 31.3% |
| Tools and equipment required to control FAW and other pests | 26.1% |
| Knowledge in integrated pest management | 15.7% |

| | |
|---|-------|
| Physical and financial access to pesticides for FAW control | 14.2% |
|---|-------|

Source: Field Survey, 2018

Table 11 presents knowledge farmers have about FAW and general pest management that they can apply in future outbreaks of FAW and other pests. More than 80 percent of farmers are able to identify FAW infestation and 75.4 percent report adequate awareness and understanding of FAW. Only 14.2 percent of farmers reported that they have the physical and financial access to pesticides to deal with a future outbreak of FAW or other pests.

Concerning access to the required tools and equipment needed to control FAW and other pests in future outbreaks, about 60 percent responded in the affirmative. Reasons given by farmers for not having the required tools include lack of financial resources to purchase equipment and lack of access to tools and equipment.

3.3.8 THE CONTRIBUTION OF COMPLEMENTARY ACTIVITIES BY THE FAW NATIONAL TASK FORCE

The FAW National Task Force is a multidisciplinary force comprising MoFA, and development partners, and agencies tasked to develop and implement strategies for the management of FAW. The project’s collaboration with MoFA through the taskforce has helped synergize FAW management, creating effective and efficient utilization of resources for training of agricultural professionals, media, input dealers, smallholder farmers, and other relevant stakeholders. The taskforce has also developed a national framework for quick response to FAW

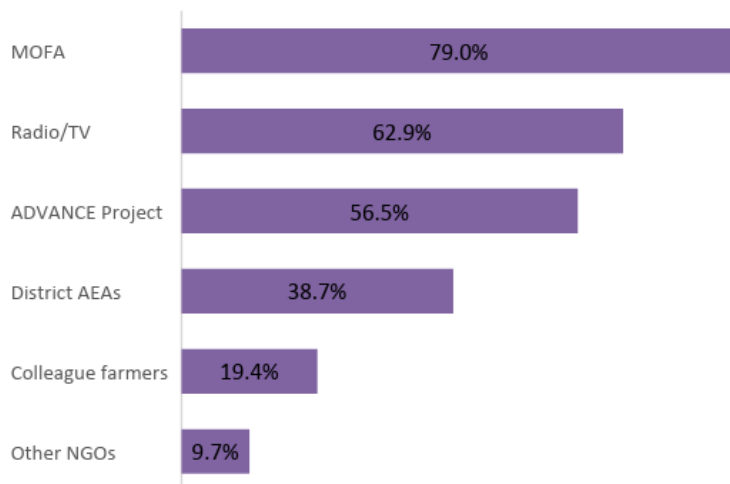
attacks. About 45 percent of the farmers have heard of the FAW National Task Force.

Most of the farmer know knew about the task force learned about it from MoFA (79 percent), followed by radio and TV messages at 62.9 percent, and the USAID’s ADVANCE project at 56.5 percent.

Details on the source of information about FAW National Task Force are depicted in Figure 17. About 10 percent of those who have heard of the FAW National Task Force also had received complementary assistance from the FAW National Task Force. Assistance received by farmers from the FAW National Task Force included:

Figure 17: Source of information about FAW National Task Force

Source: Field Survey, 2018



- Training on the application of pesticides
- Spraying Service Provision
- Pesticides application on farms
- Monitoring, surveillance, and scouting for FAW
- Training on cultural practices to adapt to prevent FAW attacks
- Control measures for FAW attacks on farm

All the farmers who received support from the FAW National Task Force were satisfied with assistance provided.

4.0 CONCLUSION

Based on the results of the “Level of Expansion of Input Dealer Businesses for Sustainability study”, the following major conclusions emerge.

Changes in the level and quality of access (timeliness, affordability, choice etc.) to all types of inputs by smallholder farmers as a result USAID’s ADVANCE’s interventions

- The introduction of VAAs has resulted in increased access to agro-inputs, by bringing the inputs to/near farmers communities to purchase as and when they need them.
- VAA activities have had positive effects on the farming businesses of smallholder farmers in the communities. They have ensured the availability of better quality of inputs, more stable prices, wider diversity of products, lower prices of inputs, timely availability, and easier access to quantities of inputs required at affordable prices.
- The seasonality of VAA operations is affecting some farmers negatively as they would like to engage in other farming activities during the lean season.
- VAAs have the added benefit of providing training to community members when they purchase from them.

Profitability of adopting the community agent strategy proposed and adopted by some wholesalers and retailers

- Based on the project strategy Input dealers have adopted the strategy of selecting and engaging trustworthy, business-minded community-based input agents who sell their products in the communities, so the farmers do not have to travel long distances to access the inputs they require.
- The VAA strategy developed and promoted by the project has increased RADs sales between 12% and 67%.

VAAs are also operating as business entities making profits to increasing their income levels

Effectiveness and efficiency of the various project strategies (community promotions, financing via OBs, FBOs, direct retailers, input agents, etc.) to promote farmers’ access to agro-inputs

- The project’s strategies have resulted in increased demand and access to production inputs and technologies. The strategies utilized include community input promotions, OB input credit schemes, the VAA approach, buyer-outgrower input schemes, VSLA share-out input promotions, and SSP operations.
- The most successful strategies ranked by most to least effective include, the VAA strategy, OB input credit schemes and VSLA share-out input promotions, community input promotions, SSPs operations, and buyer-sponsored outgrower input schemes.
- The strategies are effective, but more work needs to be done to make them more efficient.

Category of persons involved and willing to pursue input business expansion and the constraints

- The study revealed a male dominance in the input business within the entire study area.
- All VAAs and SSPs are male to prevent the exposure of females to harmful agro-chemicals.
- Most of the youth involved in the input dealerships require additional business management and administration skills.
- A major constraint hindering the expansion of RADs’ businesses is poor access to low interest loans.

Gender dimensions of increased access to and use of inputs, increased decision making, increased social capital and leadership in the community, and time and energy saving aspects, etc.

- OBs prefer to work with female OGs compared to males.
- Female OGs’ access to and use of inputs in support of their farming activities has greatly increased.

- VAAs, SSPs activities, and community input promotions have greatly ensured women have access to and use of agro-inputs to increase their productivity.
- Women's leadership and decision-making skills have been strengthened, elevating their social status in the communities.

Current status of youth engagement, barriers and strategies to enhance their involvement

- Several barriers exist which prevent the youth from participating fully on the project.

Results/impacts from crowding in from other non-supported actors (OBs, buyers and input agents, etc.) and the impact competition has had on providing better quality services and business growth.

- Competition within the agro-input business environment largely does not affect sales of RADs.
- The competition has prompted RADs to stock quality products.
- RADs do not know the market share that they control in their business environment.

Regulatory constraints that inhibit expansion of input dealerships into small communities

- Ghana has regulations on the registration, distribution and usage of pesticides to evaluate their environmental and human health effects known as the Part II of the main Ghana Environmental Protection Agency (EPA) Act, Act 490 of 1994.
- This law includes the whole pesticide life cycle, and the registration and procurement of pesticides, their import, distribution and retail to farmers, their monitoring for quality control and waste management.
- The Ghana EPA is responsible for the registration of pesticides as well as their management. The Ghana EPA further monitors pesticide use and, if needed, react against illegal use, and issues pesticides importation and user licenses.
- RADs and VAAs sometimes repackage smaller portions for OGs when needed. This is in violation of the section 44 (4) of the Act.
- RADs and VAAs do not wear protective clothing and nose masks when in their shops. This is also a clear violation of section 44 (1, 2 and 4) of the pesticides Act.

Based on the results of the "Impact of USAID's ADVANCE Pest Management for Fall Army Worm study", the following major conclusions emerge.

Effectiveness of the media campaign on the knowledge of target beneficiaries on the FAW

- The USAID's ADVANCE project has trained over 200 agriculture extension professionals
- The main sources of information for the farmers include USAID's ADVANCE and MOFA through Radio/TV.
- The media campaign on the FAW has been very effective.
- Maize yields have drastically increased after the campaign compared to the yields before the campaign.
- Several OGs have received training on FAW management from the USAID's ADVANCE project, MoFA and other NGOs.
- Farmers had limited resources (appropriate agro-chemicals) to implement the recommendation provided as USAID's ADVANCE advice of pesticides but did not provide any pesticides controlling FAW.

Extent to which the beneficiaries who were trained shared their knowledge with other farmers

- Most beneficiaries of the training have also shared information on why FAW is dangerous, how it affects crops and when it attacks crops.

- FAW trainings started in 2015 and have continued till now. A number of OG have participated in more than one FAW management training. All the beneficiaries found the FAW management training useful.
- Farmers depend on the experience of other farmers for advice on managing pests and diseases. OGs share knowledge of FAW management training with other farmers. Key information beneficiaries share with other farmers are why FAW is dangerous, how it affects crops, when it attacks and sources of information and assistance on FAW.
- Averagely OGs shared information with 10 farmers.

Contribution of the FAW Call Center to the effectiveness of the FAW management strategy

- The project acquired three call lines with WhatsApp (0266222002, 0577662000, and 0201212121) to support farmers with technical advice.
- Only a few farmers ever called the FAW call center. Main information farmers sought from the call center was how to control the FAW. Information provided farmers was useful after their application.

Major constraints the trained agents faced in supporting smallholders to manage the FAW

- The major constraints that hindered trained agents from supporting OGs include: limited access to recommended pesticides, lack of logistical and other resources to organize the training, inability to locate the sources of recommended pesticides and unavailability of smallholder farmers for training during the season.
- Other constraints are delays in the distribution of recommended chemicals for training, availability of enough quantities of recommended pesticides, funding, mentoring, monitoring and evaluation.

How farmers are equipped to deal with future outbreak of FAW, other pest emergency and general pest management

- Farmers are equipped to deal with a future outbreak of FAW, other pest emergency and general pest management. Farmers have the necessary information to deal with FAW and other pest emergencies.
- Key knowledge about FAW to apply in case of a future outbreak includes the following: a) Ability to identify FAW Attack, b) Awareness and understanding of FAW, c) Timely application of pesticides, d) Effect of the seasons on FAW Attack, e) Knowledge of various types of pesticides, f) Sources of information on FAW and other pesticides, g) Sources of agrochemicals to control pests, g) Correct application of pesticides, h) Safe handling, storage, and use of pesticides, i) Tools and equipment required to control FAW and other pests, j) Knowledge in integrated pest management and k) Physical and financial access to pesticides

Contribution of complementary activities by the FAW National Task Force

- The FAW National Task Force is a multi-disciplinary force comprising MOFA, Development Partners and Agencies tasked to develop and implement strategies for the management of FAW.
- The project's collaboration with MoFA through the taskforce has helped synergize FAW management.
- There is a national framework for quick response to FAW attacks.
- Assistance so far from the FAW National Task Force include: a) Training on the application of pesticides, b) Pesticides application on farm by SSPs, c) Monitoring, Surveillance and Scouting for FAW, d) Training on cultural practices to adapt to prevent FAW attacks and e) Control measures for FAW attack on the farm.
- Farmers who have received some support from the FAW National Task Force are satisfied with the services provided.

5.0 RECOMMENDATIONS

The following key recommendations emerged for “the assessment of the level of expansion of input dealer businesses for sustainability study”.

- The project should continue to support the development and operations of the VAAs to make them more effective and efficient, since losing VAAs for any reason would have negative effects on the farming businesses of the smallholder farmers they serve.
- The project should work with more agricultural input dealers on a strategy to expand their engagement of VAAs to cover more locations since VAAs enabled them to expand their markets, reduce their costs and increase their sales and profits.
- The project should continue and expand its support of the various strategies, including community input promotions, outgrower business (OB) input credit schemes, VAAs approach, Buyer – outgrower input schemes, the village savings and loans associations (VSLAs) share out input promotions, commercialization of safe spraying service provision, organization and capacity building of direct retailers and VAAs, as well as, the training of farmers in the use of productivity-improving inputs and technologies, owing to its resultant increased demand as well as access to these inputs and technologies.
- The project should provide more support to RADs to remove all the constraints that continue to hinder their efforts to expand the input business, including poor access to finance and delay in supply of the inputs.
- The project should continue to empower and invest in rural women when various interventions are being implemented since even a slight improvement in the assistance they receive, will have a significant effect on productivity, incomes, health and overall livelihood of the rural household.
- Despite the project’s positive impacts, youth engagement in farming and agribusiness generally, remains very low. The project should design and implement innovative youth-engagement interventions that will remove the barriers facing the youth and motivate and attract them to consider careers in agriculture and agribusiness.
- In addition to the services provided by OBs to their outgrowers, a few of them have added-on input dealerships to their portfolio. This is a good idea and so the project should assist interested OBs with business plans to add-on other business ventures like input dealerships to their operations, so they can provide more inputs and productivity-enhancing technologies to the outgrowers they work with.
- Some activities being undertaken by RADs and VAAs are in violation of various sections of the National Environmental Protection Agency (EPA) Act, Act 490 of 1994. The project should sensitize RADs and VAAs on the need for wearing protective clothing when handling agro-chemicals.

The following key recommendations emerged for “the assessment of the impact of USAID’s ADVANCE pest management for fall armyworm (FAW) study”.

- The project should continue and sustain the provision of information to sensitize farmers on FAW so that the momentum in controlling the worm is not lost.
- The project should, continue implementing innovative strategies to motivate those trained in the management of the FAW, to share the knowledge they have acquired with many others in their communities.

- The project should continue to monitor incidences of FAW in the communities to prevent future devastating outbreaks. The project should continue building farmers capacity on the recommended cultural and landscape management options for control of FAW.
- The project should provide solutions to all the identified constraints that affected the trained agents who received training on the FAW and were tasked to support smallholder farmers in managing the FAW.
- The project should continue the partnership and collaboration with MoFA, through the FAW National Task Force to synergize FAW management of resources for training of various stakeholders and implementation of the national framework for quick response to FAW attacks.

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APPENDIX

I. DISAGGREGATION OF VARIABLES BY TYPE OF RESPONDENT

| Variables | Type of Respondent | | | | | |
|---|---------------------------------------|--------------|-------------|--------------|------------|--------------|
| | Non-VSLA member | | VSLA member | | Total | |
| | N | % | N | % | N | % |
| FA1. Do you know about the Fall Army Worm? | | | | | | |
| No | 2 | 5.3 | 7 | 6.4 | 9 | 6.1 |
| Yes | 36 | 94.7 | 102 | 93.6 | 138 | 93.9 |
| Total | 38 | 100.0 | 109 | 100.0 | 147 | 100.0 |
| | Fisher's exact test (1.000) | | | | | |
| | | | | | | |
| | | | | | | |
| FA2. If yes when did you know about FAW? | | | | | | |
| 2015 season | 6 | 16.7 | 20 | 19.6 | 26 | 18.8 |
| 2016 season | 13 | 36.1 | 48 | 47.1 | 61 | 44.2 |
| 2017 season | 17 | 47.2 | 31 | 30.4 | 48 | 34.8 |
| 2018 season | 0 | 0.0 | 3 | 2.9 | 3 | 2.2 |
| Total | 36 | 100.0 | 102 | 100.0 | 138 | 100.0 |
| | | | | | | |
| | | | | | | |
| FA3. What year did you first discover the problem of FAW in your area? | | | | | | |
| 2015 | 3 | 8.3 | 12 | 11.9 | 15 | 10.9 |
| 2016 | 14 | 38.9 | 53 | 52.5 | 67 | 48.9 |
| 2017 | 19 | 52.8 | 34 | 33.7 | 53 | 38.7 |
| 2018 | 0 | 0.0 | 2 | 2.0 | 2 | 1.5 |
| Total | 36 | 100.0 | 101 | 100.0 | 137 | 100.0 |
| | LR test =4.941; p-value=0.176 | | | | | |
| FA4A. How was the FAW situation in your community in 2016? | | | | | | |
| Low | 9 | 25.0 | 8 | 7.8 | 17 | 12.3 |
| Moderate | 3 | 8.3 | 7 | 6.9 | 10 | 7.2 |
| Non-existent | 6 | 16.7 | 25 | 24.5 | 31 | 22.5 |
| Severe | 11 | 30.6 | 18 | 17.6 | 29 | 21.0 |
| Very severe | 7 | 19.4 | 44 | 43.1 | 51 | 37.0 |
| Total | 36 | 100.0 | 102 | 100.0 | 138 | 100.0 |
| | LR test =12.936; p-value=0.012 | | | | | |
| | | | | | | |
| FA4B. How was the FAW situation in your community in 2017? | | | | | | |
| Low | 4 | 11.1 | 4 | 3.9 | 8 | 5.8 |
| Moderate | 2 | 5.6 | 28 | 27.5 | 30 | 21.7 |

| Variables | Type of Respondent | | | | | |
|--|--------------------|-------|-------------|-------|-------|-------|
| | Non-VSLA member | | VSLA member | | Total | |
| | N | % | N | % | N | % |
| Non-existent | 0 | 0.0 | 3 | 2.9 | 3 | 2.2 |
| Severe | 15 | 41.7 | 40 | 39.2 | 55 | 39.9 |
| Very severe | 15 | 41.7 | 27 | 26.5 | 42 | 30.4 |
| Total | 36 | 100.0 | 102 | 100.0 | 138 | 100.0 |
| LR test =13.426; p-value=0.009 | | | | | | |
| FA4C. How was the FAW situation in your community in 2018? | | | | | | |
| Low | 10 | 27.8 | 32 | 31.4 | 42 | 30.4 |
| Moderate | 21 | 58.3 | 47 | 46.1 | 68 | 49.3 |
| Non-existent | 2 | 5.6 | 6 | 5.9 | 8 | 5.8 |
| Severe | 1 | 2.8 | 7 | 6.9 | 8 | 5.8 |
| Very severe | 2 | 5.6 | 10 | 9.8 | 12 | 8.7 |
| Total | 36 | 100.0 | 102 | 100.0 | 138 | 100.0 |
| LR test =2.400; p-value=0.663 | | | | | | |
| FA7. When FAW first became a serious problem in your area did you get the relevant information before the subsequent cropping season? | | | | | | |
| No | 15 | 41.7 | 35 | 34.3 | 50 | 36.2 |
| Yes | 21 | 58.3 | 67 | 65.7 | 88 | 63.8 |
| Total | 36 | 100.0 | 102 | 100.0 | 138 | 100.0 |

2. DISAGGREGATION OF VARIABLES BY GENDER OF HOUSEHOLD HEAD

| Variables | Gender of Household Head | | | | | |
|---|--------------------------|--------|------|--------|-------|--------|
| | Female | | Male | | Total | |
| | N | % | N | % | N | % |
| FA1. Do you know about the Fall Army Worm? | | | | | | |
| No | 3 | 4.4% | 6 | 7.6% | 9 | 6.1% |
| Yes | 65 | 95.6% | 73 | 92.4% | 138 | 93.9% |
| Total | 68 | 100.0% | 79 | 100.0% | 147 | 100.0% |
| FA2. If yes when did you know about FAW? | | | | | | |
| 2015 season | | | | | | |
| 2016 season | | | | | | |
| 2017 season | | | | | | |
| 2018 season | | | | | | |
| Total | | | | | | |

3. DISAGGREGATION OF VARIABLES BY REGION

| Variables | Region | | | | | | | | | | | |
|--|--------|--------|----|--------|----|--------|----|--------|----|--------|-------|--------|
| | ASH | | BA | | NR | | UE | | UW | | Total | |
| | N | % | N | % | N | % | N | % | N | % | N | % |
| FA1. Do you know about the Fall Army Worm? | | | | | | | | | | | | |
| No | 0 | 0.0 | 2 | 4.3 | 6 | 9.1 | 1 | 11.1 | 0 | 0.0 | 9 | 6.1 |
| Yes | 4 | 100.0 | 44 | 95.7 | 60 | 90.9 | 8 | 88.9 | 22 | 100.0 | 138 | 93.9 |
| Total | 4 | 100.0 | 46 | 100.0 | 66 | 100.0 | 9 | 100.0 | 22 | 100.0 | 147 | 100.0 |
| FA2. If yes when did you know about FAW? | | | | | | | | | | | | |
| 2015 season | 0 | 0.0% | 15 | 34.1% | 9 | 15.0% | 0 | 0.0% | 2 | 9.1% | 26 | 18.8% |
| 2016 season | 4 | 100.0% | 24 | 54.5% | 26 | 43.3% | 2 | 25.0% | 5 | 22.7% | 61 | 44.2% |
| 2017 season | 0 | 0.0% | 5 | 11.4% | 22 | 36.7% | 6 | 75.0% | 15 | 68.2% | 48 | 34.8% |
| 2018 season | 0 | 0.0% | 0 | 0.0% | 3 | 5.0% | 0 | 0.0% | 0 | 0.0% | 3 | 2.2% |
| Total | 4 | 100.0% | 44 | 100.0% | 60 | 100.0% | 8 | 100.0% | 22 | 100.0% | 138 | 100.0% |

4. DISAGGREGATION OF VARIABLES BY TYPE OF HOUSEHOLD

| Variables | Type of household | | | | | | | | Total | |
|--|----------------------|-------|-------------------|-------|-----------------|-------|-----------------------|-------|-------|-------|
| | Child Only Household | | Female Adult Only | | Male Adult Only | | Female and Male Adult | | | |
| | N | % | N | % | N | % | N | % | N | % |
| FA1. Do you know about the Fall Army Worm? | | | | | | | | | | |
| No | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 9 | 6.5 | 9 | 6.1 |
| Yes | 2 | 100.0 | 5 | 100.0 | 1 | 100.0 | 130 | 93.5 | 138 | 93.9 |
| Total | 2 | 100.0 | 5 | 100.0 | 1 | 100.0 | 139 | 100.0 | 147 | 100.0 |
| FA2. If yes when did you know about FAW? | | | | | | | | | | |
| 2015 season | | | | | | | | | | |
| 2016 season | | | | | | | | | | |
| 2017 season | | | | | | | | | | |
| 2018 season | | | | | | | | | | |
| Total | | | | | | | | | | |

5. QUESTIONNAIRES FOR THE STUDY

ASSESSING THE LEVEL OF EXPANSION OF INPUT DEALER BUSINESSES FOR SUSTAINABILITY AND THE IMPACT OF ADVANCE PEST MANAGEMENT FOR FALL ARMYWORM (FAW) STUDY

QUESTIONNAIRE FOR OGS

| | | | |
|--|--|----------------|--------------------------------|
| Date of interview | | November, 2018 | |
| Enumerator code | | | |
| Respondent code | | | |
| PART A - DEMOGRAPHICS | | | |
| Region | 1) Ashanti 2) Brong Ahafo 3) Northern 4) Upper East 5) Upper West | | |
| District | | | |
| Community | | | |
| GPS co-ordinates | | | |
| Name of farmer | | | |
| Sex | 1) Male 2) Female | | |
| Age | 1) years | | |
| Educational Level | 1) No schooling 2) Adult education / Non-Formal Education 3) Primary 4) Secondary 5) Vocational 6) Tertiary | | |
| Literacy level (Can you read and write) | 1) Yes 2) No | | |
| Family Status (position in household) | 1) Male family head 2) Female family head 3) Dependent | | |
| Types of crops grown | 1) Vegetables 2) Maize 3) Rice 4) Soybean 5) Others | | |
| Total farm size for each commodity cultivated this year? | Crop | Area | Unit 1=Ha 2=Acres |
| | Vegetables | | |
| | Maize | | |
| | Rice | | |

| | | | | |
|--|----------------------------|----------------|--|--|
| | | Soybean | | |
| | | Other, specify | | |
| | Number of years in farming | | | |

Part C - ASSESSMENT OF THE LEVEL OF EXPANSION OF INPUT DEALER BUSINESSES FOR SUSTAINABILITY

| # | Question | Responses | Comments |
|---|---|--|----------|
| B. Determine any changes in the level and quality of access (timeliness, affordability, choice availability, etc.) to all types of inputs by smallholder farmers as a result ADVANCE's interventions | | | |
| B1 | Do you usually use agro inputs on your farm? | 1) Yes 2) No | |
| B2 | If yes, what agro inputs do you use on your farm? | Please list | |
| B3 | Do you have a Village-level agri-input agents in your community? | 1) Yes 2) No | |
| B4 | How far is the agent's shop from your community? | 1) Less than 1 km 2) 1 km 3) 2 km 4) 3 km 5) 4 km 6) 5 km 7) Above 5 km | |
| B5 | Before the VAA started activities in your community/area, where did you get your supplies from? | 1) Another agro-input dealer in the community 2) From NGOs project 3) Nearby Town/City 4) Other, please specify | |
| B6 | How far was the agri-input dealer's shop from your community before the VAA started activities in your community? | km | |
| B7 | Previously, were you able to get all your inputs from this source? | 1) Yes 2) No | |
| B8 | If no, what inputs were you not getting? | Please list | |
| B9 | Previously, any time you couldn't get the agro-inputs you needed from the dealer, what was the alternative? | 1. Go to another input dealer in same town 2. Go to another input dealer in nearby Town/City 3. Check back with the input dealer later 4. Go to NGOs project in same town/city 5. Go to NGOs project in nearby town/city | |

| # | Question | Responses | Comments |
|---|--|---|----------|
| B. Determine any changes in the level and quality of access (timeliness, affordability, choice availability, etc.) to all types of inputs by smallholder farmers as a result ADVANCE's interventions | | | |
| | | 6. Arrange for the input dealer to deliver input later 7. Pre-pay to input dealer for later delivery 8. Pre-pay to input dealer and pick up input later 9. Other (specify) | |
| B10 | Does the community agro input agent have all the inputs you require <u>at the time you need them?</u> | 1) Yes 2) No | |
| B11 | If no, what is the alternative? | 1. Arrange for the agent to deliver input later 2. Pre-pay to agent for later delivery 3. Pre-pay to agent and pick up input later 4. Check back with the agent later 5. Other (specify) | |
| B12 | Is the agro input agent able to supply <u>all your agro input needs?</u> | 1. Yes 2. No | |
| B13 | If no, what is the alternative? | 1. Arrange for the agent to deliver rest of inputs later 2. Pre-pay to agent for later delivery of the rest of inputs 3. Pre-pay to agent and pick up rest of input later 4. Check back with the agent for rest of input later 5. Other (specify) | |
| B14 | Are there times when you do not get a particular input that you urgently require? | 1) Yes 2) No | |
| B15 | If yes, specify the inputs you do not get. | Please list | |
| B16 | If yes, what is the alternative? | 1. arrange for the agent to deliver input later 2. pre-pay to agent for later delivery 3. pre-pay to agent and pick up input later 4. check back with the agent later 5. other (specify) | |

| # | Question | Responses | Comments |
|---|---|---|----------|
| B. Determine any changes in the level and quality of access (timeliness, affordability, choice availability, etc.) to all types of inputs by smallholder farmers as a result ADVANCE's interventions | | | |
| B17 | What changes would you attribute to the operations of the VAA in your production activities? | Select all that apply 1) Regular availability of needed inputs 2) Lower prices of inputs 3) Wider variety of inputs 4) Timely availability of inputs 5) More stable input prices 6) Better quality of inputs 7) Easier access to quantities of inputs required 8) Other, please specify | |
| B18 | What would happen to your farming activities if the community input dealer were to shut down his/her operations in your community/area? | 1) Travel to another location for inputs 2) May not get the diversity of inputs needed 3) Cost of inputs will increase 4) Buy more than I need since I do not want to go back 5) Timeliness of the inputs will be a challenge 6) May not get certain required inputs 7) Other, please specify | |
| B19 | How do prices you used to pay at the previous sources for agro-inputs compare to prices you pay now with the community input agent? | 1) Similar prices 2) Lower prices now 3) Higher prices now 4) Others, please specify | |
| B20 | Does ADVANCE provide you with technical and business management training? | 1) Yes 2) No | |
| B21 | If yes, what kinds of training? | Please state | |
| B22 | Are public extension officers available and active in your area? | 1) Yes 2) No | |
| B23 | Are there other input suppliers in your community? | 1) Yes 2) No | |
| B24 | If there is, how many are they and do they sell similar products? | 1) Yes 2) No | |
| B25 | Do they sell the various agro inputs at similar prices? | 1) Yes 2) No | |
| B26 | Does the VAA in your community operate throughout the year? | 1) Yes 2) No | |
| B27 | If no, what is the reason for stopping the operations during certain periods? | Kindly state | |

PART D - IMPACT OF USAID's ADVANCE PROJECT PEST MANAGEMENT STRATEGY FOR FALL ARMY WORM (FAW)

| # | Question | Responses | | Comments |
|---|---|--|---|---|
| A. The effectiveness of the media campaign on the knowledge of target beneficiaries on FAW | | | | |
| FA1 | Do you know about the fall army worm? | 3) Yes 4) No | | |
| FA2 | If yes when did you know about FAW? | 1) 2015 season 2) 2016 season 3) 2017 season 4) 2018 season | | |
| FA3 | What year did you first discover the problem of FAW in your area? | (Indicate year) | | |
| FA4 FA5 | How was the FAW situation in your community in 2016 and 2017 | 2016 3) Very severe 4) Severe 5) Moderate 6) Low 7) Non-existent | 2017 1. Very severe 2. Severe 3. Moderate 4. Low 5. Non-existent | 2018 1. Very severe 2. Severe 3. Moderate 4. Low 5. Non-existent |
| FA6 | What do you know about it? | Select all that apply 1) What the FAW is 2) How it affects crops 3) When does it affect crops 4) Its effect on crops 5) How to control it | | |
| FA7 | When FAW first became a serious problem in your area, did you get the relevant information before the subsequent cropping season? | 1) Yes 2) No | | |
| FA8 | If no, did you suffer serious crop losses when the FAW was first identified in your area? | 1) Yes 2) No | | |
| FA9 | Did you get the information before the cropping season to make it useful to your farming? | 2) No | 1) Yes | |
| FA10 | Where did you get the information from? | Select all that apply 1) MoFA 2) District Agricultural Extension Agents (AEAs) 3) ADVANCE Project 4) Other NGOs 5) Radio/TV 6) Colleague farmers | | |
| FA11 | If from ADVANCE project, indicate the mode of the information | 1. Radio jingles 2. Radio broadcasts 3. Posters | | |

| # | Question | Responses | Comments |
|---|---|--|----------|
| A. The effectiveness of the media campaign on the knowledge of target beneficiaries on FAW | | | |
| | | 4. Fliers 5. TV 6. Other (specify) | |
| FA12 | How often were you receiving these information on FAW? | 1) Every day 2) Every 2 days 3) Every 3 days 4) Weekly 5) Bi-weekly 6) Monthly | |
| FA13 | What did you learn about the fall army worm during the media campaign? | Select all that apply 1) What the fall army worm is 2) Why it is dangerous 3) When it attacks 4) Which part of the plant it attacks 5) How it affects crops 6) Different methods to control it 7) Sources of information and assistance on the fall army worm | |
| FA14 | Has the information you received been useful in protecting your maize crop? | 1) Yes 2) No | |
| FA15 | If yes, to what extent did the information help you to protect you maize? | 1. High 2. Moderate 3. Low 4. Not at all | |
| FA16 | How did you control the FAW to protect your maize? | | |
| FA17 | What was the impact of the FAW attack on your yield of maize when you did not know about the FAW and its control? | 1) High 2) Moderate 3) Low 4) Not at all | |
| FA18 | What was the impact of the FAW on your yield of maize since you got information about its effects on maize and how to control it? | 3) High 4) Moderate 5) Low 6) Not at all | |
| FA19 | What reasons can you give for this impact (multiple answers apply) | 1) Information provided was very helpful 2) Information provided was not very helpful 3) Had enough resources to implement the recommendations provided | |

| # | Question | Responses | Comments |
|--|--|--|----------|
| A. The effectiveness of the media campaign on the knowledge of target beneficiaries on FAW | | | |
| | | 4) Did not have enough resources to implement the recommendations provided 5) Other, please specify | |
| B. The extent to which the beneficiaries who were trained shared their knowledge with other farmers | | | |
| FB1 | Did you receive any training on the fall army worm management? | 1) Yes 2) No | |
| FB2 | If yes who provided the training? | 1) MoFA 2) District Agricultural Extension Agents (AEAs) 3) ADVANCE Project 4) Other NGOs | |
| FB3 | If yes when were you trained on the FAW? (Multiple answers apply) | 1) 2015 season 2) 2016 season 3) 2017 season 4) 2018 season | |
| FB4 | Did you find the training useful? | 1) Yes 2) No | |
| FB5 | Do farmers in your area depend on the experience of others for advice on managing pest and diseases? | 1) Yes 2) No | |
| FB6 | If yes, have you shared this information with other colleague-farmers? | 1) Yes 2) No | |
| FB7 | If yes, what key information did you share with other farmers? | Select all that apply 1) What the fall army worm is 2) Why it is dangerous 3) When it attacks 4) Which part of the plant it attacks 5) How it affects crops 6) Different methods to control it 7) Sources of information and assistance on the fall army worm | |
| FB8 | About how many people have you shared the information with? | Please state the exact number | |
| FB9 | How did you share this information? | 1) Through phone calls 2) Through group discussions in the community 3) Farmers came to me for the information 4) On their farms (word of mouth) | |

| # | Question | Responses | Comments | | | | | | | | | | | | | | | |
|--|--|---|----------|------|------|---------|---------|---------|--------|--------|--------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--|
| A. The effectiveness of the media campaign on the knowledge of target beneficiaries on FAW | | | | | | | | | | | | | | | | | | |
| | | 5) Other, please specify | | | | | | | | | | | | | | | | |
| C. The contribution of the fall army worm <i>call center</i> to the effectiveness of the FAW management strategy | | | | | | | | | | | | | | | | | | |
| FC1 | Did you ever call into the FAW call center for information? | 1) Yes 2) No | | | | | | | | | | | | | | | | |
| FC2 | If yes, how many times did you call them | Please state the number of times | | | | | | | | | | | | | | | | |
| FC3 | If you ever called the center what question information did you need from them. | Please specify | | | | | | | | | | | | | | | | |
| FC4 | If you ever called the center, was the information they provided useful to you? | 1) Yes 2) No | | | | | | | | | | | | | | | | |
| FC5 | If yes, were you always able to apply the information provided in your farming activities? | 1) Yes 2) No | | | | | | | | | | | | | | | | |
| FC6 | If no, what were the barriers that prevented you from successfully applying the recommendations provided by the call center? | Select all that apply 1) Inability to locate sources of pesticides 2) Limited access to effective pesticides 3) Inadequate knowledge of fall army worm biology 4) Didn't have the resources 5) The information was not clear to me 6) Other, please specify | | | | | | | | | | | | | | | | |
| D. How are the farmers equipped to deal with future outbreak of fall arm worm, other pest emergencies, and general pest management? | | | | | | | | | | | | | | | | | | |
| FD1 FD2 | Where did you get assistance in controlling the FAW? | <table border="1"> <thead> <tr> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>1. MoFA</td> <td>1. MoFA</td> <td>1. MoFA</td> </tr> <tr> <td>2. SSP</td> <td>2. SSP</td> <td>2. SSP</td> </tr> <tr> <td>3. Trained Agents</td> <td>3. Trained Agents</td> <td>3. Trained Agents</td> </tr> <tr> <td>4. Other, specify</td> <td>4. Other, specify</td> <td>4. Other, specify</td> </tr> </tbody> </table> | 2016 | 2017 | 2018 | 1. MoFA | 1. MoFA | 1. MoFA | 2. SSP | 2. SSP | 2. SSP | 3. Trained Agents | 3. Trained Agents | 3. Trained Agents | 4. Other, specify | 4. Other, specify | 4. Other, specify | |
| 2016 | 2017 | 2018 | | | | | | | | | | | | | | | | |
| 1. MoFA | 1. MoFA | 1. MoFA | | | | | | | | | | | | | | | | |
| 2. SSP | 2. SSP | 2. SSP | | | | | | | | | | | | | | | | |
| 3. Trained Agents | 3. Trained Agents | 3. Trained Agents | | | | | | | | | | | | | | | | |
| 4. Other, specify | 4. Other, specify | 4. Other, specify | | | | | | | | | | | | | | | | |
| FD3 | Do you think you have the necessary information to deal with FAW and other pest emergencies? | 1) Yes 2) No | | | | | | | | | | | | | | | | |
| FD4 | What knowledge do you have about fall arm worm and general pest management that you can apply in | Select all that apply 1) Awareness and understanding of FAW 2) Ability to identify FAW attack | | | | | | | | | | | | | | | | |

| # | Question | Responses | Comments |
|---|---|--|----------|
| A. The effectiveness of the media campaign on the knowledge of target beneficiaries on FAW | | | |
| | future outbreaks of FAW and other pests? | 3) Effect of the seasons on FAW attack 4) Sources of information on FAW and other pestilences 5) Knowledge of various types of pesticides 6) Sources of agrochemicals to control pests 7) Physical and financial access to pesticides 8) Correct application of pesticides 9) Timely application of pesticides 10) Safe handling, storage and use of pesticides 11) Tools and equipment required to control FAW and other pests 12) Knowledge in integrated pest management 13) Others, please specify | |
| FD5 | Do you have access to the required tools and equipment needed to control FAW and other pests in future outbreaks? | 1) Yes 2) No | |
| FD6 | If no, why the lack of access for the required tools and equipment needed? | (Please give reasons) | |
| E. The contribution of complementary activities by the FAW National Task Force | | | |
| FE1 | Have you heard about the MoFA FAW National Task Force? | 1) Yes 2) No | |
| FE2 | If yes, where did you hear about it (source of information)? | 1) MoFA 2) District Agricultural Extension Agents (AEA) 3) ADVANCE Project 4) Other NGOs 5) Radio/TV 6) Colleague farmers | |
| FE3 | Have you received any complementary assistance from the FAW National Task Force? | 1) Yes 2) No | |
| FE4 | If yes, what assistance have you received? | Please list as many as you remember | |

| # | Question | Responses | Comments |
|---|---|---------------------------------|----------|
| A. The effectiveness of the media campaign on the knowledge of target beneficiaries on FAW | | | |
| FE5 | Are you satisfied with the assistance received so far from FAW National Task Force? | 1) Yes 2) No | |
| FE6 | If no, what assistance do you need? | Please list as many as you need | |

QUESTIONNAIRE FOR AGRI INPUT DEALERS (RADs)

| | | | | |
|--|----------------|--|--------------------------------|--|
| Date of interview | | November, 2018 | | |
| Enumerator code | | | | |
| Respondent code | | | | |
| PART A - DEMOGRAPHICS | | | | |
| Region | | 1) Brong Ahafo 2) Northern 3) Upper East 4) Upper West 5) Ashanti | | |
| District | | | | |
| Community | | | | |
| GPS co-ordinates | | | | |
| Name of farmer | | | | |
| Sex | | 1) Male 2) Female | | |
| Age | | years | | |
| Educational Level | | 1) No schooling 2) Adult education / Non-Formal Education 3) Primary 4) Secondary 5) Vocational 6) Tertiary | | |
| Literacy level (Can you read and write) | | 1) Yes 2) No | | |
| Family Status (position in household) | | 1) Male family head 2) Female family head 3) Dependent | | |
| Types of crops grown | | 1) Vegetables 2) Maize 3) Rice 4) Soybean 5) Others | | |
| Total farm size for each commodity cultivated this year? | Crop | Area | Unit 1=Ha 2=Acres | |
| | Vegetables | | | |
| | Maize | | | |
| | Rice | | | |
| | Soybean | | | |
| | Other, specify | | | |
| Number of years in farming | | (years) | | |
| Number of years in agro-input dealership | | (years) | | |

| | | |
|--|--|--------------------------------------|
| | Kindly indicate outlets you have by location and years of establishment: | |
| | a. | (years) |
| | b. | (years) |
| | c. | (years) |
| | d. | (years) |
| | e. | (years) |
| | Is your business formally registered? | 1. Yes 2. No |
| | How many staff work for you? | # of persons |
| | a. Permanent, full-time | M: F: |
| | b. Temporary staff | M: F: |
| | How many full-time positions are occupied by youth (<30yrs) | persons |
| | Did any of your permanent staff leave your employment? | 1. Yes 2. No |
| | Distribution of your clients | M: F: Youth: |

Part B - ASSESSMENT OF THE LEVEL OF EXPANSION OF INPUT DEALER BUSINESSES FOR SUSTAINABILITY

| # | Question | Responses | Comments |
|---|--|--|----------|
| F. Determine the profitability of adopting the community agent strategy proposed and adopted by some wholesalers and retailers (These are to be administered to only agri-input dealers) | | | |
| A1 | In which year did you adopt the VAA strategy? | (State the year) | |
| A2 | Since you adopted the Village-level agri-input agents' strategy, has demand for your agro inputs from farmers increased? | 1) Yes 2) No | |
| A3 | Do farmers in your communities have enough purchasing power to access supplies? | 1) Yes 2) No | |
| A4 | If no, what are the reasons? | | |
| A5 | How do farmers in your area pay for their supplies? | 1) Physical cash 2) Electronic cash (mobile money) 3) Credit 4) In-kind payment | |
| A6 | Kindly provide the distribution of your sales by payment method |% cash % in-kind | |
| A7 | Have your sales of agro inputs increased as a result of adopting the Village-level agri-input agents' strategy? | 1) Yes 2) No | |
| A8 | If yes, give an estimate of the increase in sales since you adopted the VAA strategy. | 1. 1 – 10 % 2. 11 – 20% 3. 21 – 30% 4. 31 – 40% 5. 41 – 50% 6. above 50% | |
| A9 | What proportion of your sales comes from the community input promotions | 1. 1 – 10 % 2. 11 – 20% 3. 21 – 30% 4. 31 – 40% 5. 41 – 50% 6. above 50% | |
| A10 | What is the source of your increase in sales? | 1. Selling more to the same number of clients 2. Selling same amounts to more clients 3. Both. | |

| # | Question | Responses | Comments |
|---|---|--|----------|
| F. Determine the profitability of adopting the community agent strategy proposed and adopted by some wholesalers and retailers (These are to be administered to only agri-input dealers) | | | |
| A11 | Have you observed a decrease in your overall operational costs (logistics, warehousing, and distribution) due to your adoption of the community agent strategy? | 1) Yes 2) No 3) No change | |
| A12 | If yes, give an estimate of the decrease in cost since you adopted the VAA strategy. | 1. 1 – 10 % 2. 11 – 20% 3. 21 – 30% 4. 31 – 40% 5. 41 – 50% 6. above 50% | |
| A13 | Do you get your supplies from your source of inputs promptly? | 1) Yes 2) No | |
| A14 | How do you finance your agro input business? | 1) Personal resources 2) Family/friends 3) Banks 4) Money lender | |
| A15 | What do you do during the off-season when demand for agro inputs is low? | Please state | |
| A16 | Do you have other sources of income apart from what you make as a community input agent? | 1) Yes 2) No | |
| A17 | If yes, what other things do you sell as alternative sources of income? | Select all that apply. 1) Wood 2) Food 3) Building materials 4) Charcoal 5) Farm produce 6) Agro-processed products 7) Others | |
| A18 | Have you received any training in financial management and business planning to support your businesses? | 1) Yes 2) No | |
| A19 | If yes who provided the training? | 1. PPRSD, MoFA 2. EPA 3. ADVANCE 4. NGO Project 5. Other (specify) | |
| A20 | Kindly specify the areas in which you trained | 1. Basic technical knowledge of the inputs | |

| # | Question | Responses | Comments |
|---|--|--|----------|
| F. Determine the profitability of adopting the community agent strategy proposed and adopted by some wholesalers and retailers (These are to be administered to only agri-input dealers) | | | |
| | | 2. General business transactions such as accounting and record keeping 3. Sales management 4. Service management 5. Other (specify) | |
| A21 | Have you received any training in technical and product knowledge of agricultural inputs? | 1) Yes 2) No | |
| A22 | If yes, from which organization? | (Please state organization) | |
| A23 | In which areas did you receive this training? | Please state | |
| A24 | Are you the only one in your shop responsible for selling the agro inputs to the farmers? | 1) Yes 2) No | |
| A25 | If no, do you have a store attendant who does the actual selling of the inputs to farmers? | 1) Yes 2) No | |
| A26 | If yes, have you or any organization trained your store attendant in the technical details of the products that are required by farmers who patronize your shop? | 1) Yes 2) No | |
| A27 | If you have a store attendant, have you provided the person with training on general business transactions such as accounting and record keeping? | 1) Yes 2) No | |
| A28 | Do you actively impart the basic technical knowledge you have acquired to farmers in order to enable them to maximize returns from the productivity enhancing inputs and technologies that you supply to them? | 1) Yes 2) No | |
| A29 | If yes, do you get all your needed supplies from your store? | 1) Yes 2) No | |
| A30 | What percentage of your total annual income is derived from the sale of inputs? | Kindly state | |
| A31 | Is the business a profitable one? | 1) Yes 2) No Please explain your answer | |

| # | Question | Responses | Comments |
|---|--|---|----------|
| F. Determine the profitability of adopting the community agent strategy proposed and adopted by some wholesalers and retailers (These are to be administered to only agri-input dealers) | | | |
| A32 | Do you get incentives from your supplier? | 1) Yes 2) No | |
| A33 | If yes, mention these incentives | Please state the incentives | |
| A34 | Indicate the challenges encountered in your day to day running of your business as AID | Please indicate the challenges | |
| A35 | Have your customer base increased since you adopted the Village-level agri-input agents VAAs strategy? | 1. Yes 2. No 3. No change | |
| A36 | Give an estimate of the increase/ decrease in customer base since you adopted the VAA strategy. | 1. 1 – 10 % 2. 11 – 20% 3. 21 – 30% 4. 31 – 40% 5. 41 – 50% 6. above 50% | |

A. Provide your income streams and expenditure outlays for your agro-input shop (For Agri-Input Dealers)

| INCOME | Quantity | Unit 1= Kilogram 2= Liters 3= Boxes | Unit cost (GHS) | Total cost (GHS) | EXPENDITURE | Quantity | Unit 1= Kilogram 2= Liters 3= Boxes | Unit cost (GHS) | Total cost (GHS) |
|--------------------------|----------|--|-----------------------|------------------------|-----------------------------|----------|--|-----------------------|------------------------|
| 2016 | | | | | | | | | |
| Liquid fertilizer | | | | | Fixed cost | | | | |
| Solid fertilizer | | | | | Rent (Shop) | | | | |
| Insecticides | | | | | Storage facility | | | | |
| Fungicides | | | | | | | | | |
| Weedicides | | | | | Total | | | | |
| Seed | | | | | | | | | |
| Knapsack sprayer | | | | | Variable cost | | | | |
| Clothing | | | | | Electricity | | | | |
| Wellington boot | | | | | Transportation | | | | |
| Nose mask | | | | | Cost of inputs purchased | | | | |
| Cutlass | | | | | Labour (Casual) | | | | |
| Hoe | | | | | Labour (Managerial) | | | | |
| Other 1 | | | | | Total | | | | |
| TOTAL REVENUE | | | | | TOTAL COST | | | | |
| 2017 | | | | | | | | | |
| Liquid fertilizer | | | | | Fixed cost | | | | |
| Solid fertilizer | | | | | Rent (Shop) | | | | |
| Insecticides | | | | | Storage facility | | | | |
| Fungicides | | | | | | | | | |
| Weedicides | | | | | Total | | | | |
| Seed | | | | | | | | | |
| Knapsack sprayer | | | | | Variable cost | | | | |
| Clothing | | | | | Electricity | | | | |
| Wellington boot | | | | | Transportation | | | | |

| INCOME | Quantity | Unit 1= <i>Kilogram</i> 2= <i>Liters</i> 3= <i>Boxes</i> | Unit cost (GHS) | Total cost (GHS) | EXPENDITURE | Quantity | Unit 1= <i>Kilogram</i> 2= <i>Liters</i> 3= <i>Boxes</i> | Unit cost (GHS) | Total cost (GHS) |
|--------------------------|----------|--|-----------------------|------------------------|-----------------------------|----------|--|-----------------------|------------------------|
| 2016 | | | | | | | | | |
| Nose mask | | | | | Cost of inputs purchased | | | | |
| Cutlass | | | | | Labour (Casual) | | | | |
| Hoe | | | | | Labour (Managerial) | | | | |
| Other | | | | | Total | | | | |
| TOTAL REVENUE | | | | | TOTAL COST | | | | |
| 2018 | | | | | | | | | |
| Liquid fertilizer | | | | | Fixed cost | | | | |
| Solid fertilizer | | | | | Rent (Shop) | | | | |
| Insecticides | | | | | Storage facility | | | | |
| Fungicides | | | | | | | | | |
| Weedicides | | | | | Total | | | | |
| Seed | | | | | | | | | |
| Knapsack sprayer | | | | | Variable cost | | | | |
| Clothing | | | | | Electricity | | | | |
| Wellington boot | | | | | Transportation | | | | |
| Nose mask | | | | | Cost of inputs purchased | | | | |
| Cutlass | | | | | Labour (Casual) | | | | |
| Hoe | | | | | Labour (Managerial) | | | | |
| Other | | | | | Total | | | | |
| TOTAL REVENUE | | | | | TOTAL COST | | | | |

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