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# AGRA VBA Evaluation: Phase 1 Report

**June 2, 2023**

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# Executive summary

## VBA program overview

In 2017, AGRA introduced the Village Based Advisor (VBA) program in eight countries to address a glaring gap in agricultural extension services in Sub-Saharan Africa. The VBA program recruits respected lead farmers from local communities to be trained on good agricultural practices and other income-generating activities so that they can disseminate the practices in their local communities. The VBA program works closely with public extension officials to select, train, and support the VBAs in their work with farmers. Implementing partners also connect VBAs to input providers and offtakers so that farmers can access improved inputs and find a market for their produce. In the process, VBAs have the opportunity to generate income and even start their own agri-enterprises. These profit-driven activities promote the sustainability of the VBAs, and this allows them to continue to offer services to farmers in their communities.

AGRA and the Bill and Melinda Gates Foundation contracted Mathematica to conduct an evaluation of the VBA program in in two phases. This Phase 1 evaluation covers five program countries— Burkina Faso, Kenya, Mozambique, Nigeria and Tanzania—and addresses the effect of the program on VBAs themselves, the systems change in which they are embedded and which they influence, and the prospects for the sustainability of the program. A subsequent Phase 2 evaluation in Kenya, Mozambique, and Nigeria will address the impact of the VBA program on farmers through a rigorous matched-comparison design.

## Evaluation design

We employed an insight-mining/outcomes-harvesting approach to respond to the research questions that cover three study areas:

1. Program innovations, including the design of the VBA program, experiences with the digitalization of VBAs, and program costs.
2. Impacts on VBA incomes, social standing, and motivations to continue. We also look at differences between men and women VBAs and between older and younger VBAs.
3. Impacts on public and private extension systems, including impacts on markets and the sustainability of the VBA program.

Data collection across all five countries included in-depth interviews with 180 informants who interact with the program, such as VBAs themselves, public extension officials, private sector actors, and global experts. We conducted 35 focus groups with farmers who work with VBAs, and we surveyed 1032 VBAs via a brief phone survey to gather a representative picture of the key outcomes, such as income, motivations, and challenges in the VBA role and differences for women and men and for younger and older VBAs.

## Findings

### Program innovations

**Our evaluation found that the VBA program has operated as designed and was effective in extending the reach of public extension programs.** The focus of VBA training has been on good agriculture practices (GAPs), seeds, and input use. Demonstration plots and seed packs are the primary way that VBAs encourage farmers to adopt GAPs. In some cases, VBA trainings also covered business or marketing skills and postproduction processes.

**There were some differences in how AGRA implemented the program across the five countries.**

- In all countries except Mozambique, VBA market and training activities focused more on linkages to input providers than to off-takers.
- Kenya was the only country to emphasize climate change adaptation and nutrition, although the other countries included some training on practices that promoted resilience to weather events.

**The selection of VBAs from local communities is an important feature of the model because it helped build trust between VBAs and farmers.** VBAs were also able to deliver advice on improved farming practices closer to famers. The VBA connection to markets for enhanced inputs also appears to benefit farmers because it lowered transportation costs, increased availability, and improved prices for farmers.

**The rollout of the digital application CropIn (or SmartFarm in some countries) has faced some early challenges, including application compatibility and network connectivity.** Although few VBAs in our data collection reported using CropIn, many VBAs apply more commonly available digital tools in their work, such as WhatsApp, Facebook, and other agriculture-related digital applications.

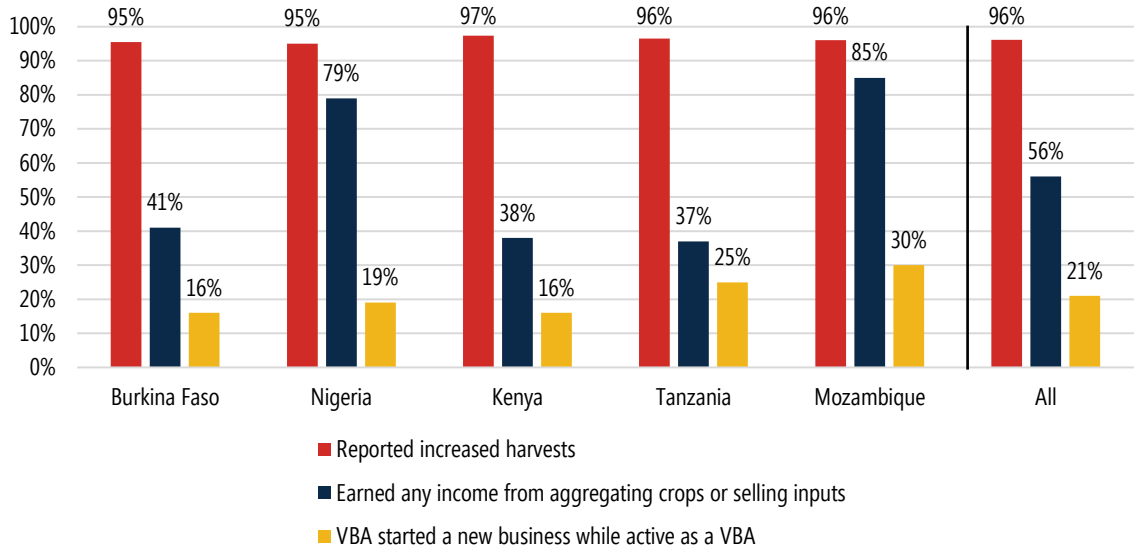
**Training costs are the main cost driver of the program**. The cost per VBA and cost per farmer served varies between countries but is approximately $853 per VBA on average and $3.36 per farmer. We found that the program costs are well below those of comparator programs for which we received cost data. However, these comparator programs often provide more intensive business development services. There are other "hidden costs" that VBAs bear, including transportation costs, opportunity costs, and expenses related to setting up businesses.

### VBA impact

**The primary pathway for earning additional income was from improved farm productivity, although more than half earned some income from connecting farmers to markets and 20 percent started businesses.** However, these rates varied considerably across countries (Figure ES1). The level of market development and infrastructure affected the ability of VBAs to earn income from input selling and off-taking. In Mozambique, VBAs were able to leverage the relatively less developed village-level input and output markets to establish themselves in the market. Whereas, in Kenya, where there is already high penetration of agri-

dealers in rural areas, VBAs who wanted to sell inputs or establish agri-businesses faced more competition.

**Figure ES.1. Percent of VBAs with improved harvests, income, and new businesses (percentages among phone survey respondents)**




Source: VBA phone survey, December 2022.
N = 1,032.

**Across countries, the main challenges VBAs faced were the lack of access to finance and high transportation costs that limited their ability to pursue market opportunities.** They also bore significant time burdens in providing extension services to farmers. Despite these challenges, VBAs were motivated to continue in their role by improved harvests, both for themselves and the farmers in their communities, as well as the income they earned as input sellers and agri-business owners.

**Long-standing social and cultural norms inhibited the recruitment and retention of women as VBAs**. They also have higher household time burdens and mobility challenges in their roles. Despite the challenges, most implementers reported that women VBAs perform as well if not better than men VBAs in their extension activities, partly because they are able to access a large web of social groups and because women farmers prefer working with them over men.

**Implementers found youth to be more difficult to retain as VBAs due to the lure of more lucrative opportunities and lack of land access.** Young people tend to be more mobile and often leave rural areas to further their education or search for employment opportunities with steadier income streams than being a VBA can offer. However, implementers also noted that young VBAs can be skilled trainers because they seem quick to absorb and disseminate new agricultural knowledge and were more likely to be skilled in using technology

**Systems change**

The VBA program is both embedded in public extension and private market systems and also has the potential to exert influence on those systems.

In the **private market system**, we found:

- VBAs expanded input suppliers' market share and reach.
- Despite this increase in input supply and access, market transactions are limited by high prices, lack of access to credit, and poor infrastructure.
- There were relatively weak links between VBAs/farmers and off-takers, with the notable exception of Mozambique.
- Connections to off-takers were challenging because off-takers often require enough output at a consistent quality. At the same time, farmers must be willing and able to follow through on contracts made in advance of their harvest amid volatile selling prices.

In the **public extension system**, we found:

- The VBA model complemented the public extension and advisory system, and extension officials strongly support the program.
- As a result, extension officials and implementers across almost all countries have advocated for the formal inclusion of VBAs in their national and subnational policies.
- The implementation of and budget allocation for VBA-related policies, depended on enduring public commitment.

**We found evidence of sustainability even after AGRA support has ended,** as some VBAs continue in their role of connecting farmers to markets and extending extension support. Some VBAs report not only continuing to sell inputs or aggregate produce but also to continue training farmers and being a resource to them when they have questions on agricultural practices. The primary sustainability pathways are through (1) maintaining a sustainable agribusiness or (2) being formalized in a public sector program:

1. **Sustainable agribusiness:** If AGRA is to follow a private sector sustainability pathway, it would require a different cost structure, shifting more resources to business development training and initial selection and overall higher investment per VBA. This model might help attract more youth who are keenly interested in income generation.

2. **Formalized in public extension**: The public sector sustainability pathway requires establishing strong relationships with government actors and formal links with government institutions. However, one of the quickest pathways for scale might be through the wholesale adoption of the VBA model into the national extension system that is currently in process in Burkina Faso and Nigeria.

## Conclusion and recommendations

**Phase 1 evaluation results suggest that the VBA program is achieving the early outcomes identified in the program theory of change** related to training and connection to input suppliers, but there is mixed support for connections to off-takers. We also found strong support for the impact of the VBA program on the reach of the extension program but mixed results for VBAs' ability to earn income. Many of the key assumptions related to VBA-level impacts are only partially held. For example, access to financing or credit was weak to nonexistent in most countries, and digitization infrastructure was sometimes inadequate. Overall, VBAs appeared to be generally successful in expanding the reach of extension and improving market linkages. However, the lack of access to capital and challenges in connecting to off-taking markets, weak infrastructure, and lack of programmatic focus on entrepreneurship mean that it would be difficult to sustain the program purely through market systems.

**Moving forward, we recommend that AGRA assess each country of operation to determine the appropriate sustainability pathway.** Countries with a gap in last-mile delivery but otherwise strong input and output markets are good candidates for an agribusiness sustainability pathway. Countries that lack those conditions but have a robust public commitment to extension might be better candidates for a public extension sustainability pathway. AGRA should design VBA programs for each country based on their pathway assessment and then set related targets. In addition, we recommend that AGRA's strategy for scaling include the following, each of which may be more or less important depending on the sustainability pathway:

- **Facilitating access to credit, business start-up support and a broader basket of goods and services can help VBAs earn more reliable income.** AGRA should consider supporting VBAs with startup capital and increased business development support if the goal is to ensure that they sustain viable businesses. (*Private sector pathway*)
- **Formalizing relationships with government actors**. AGRA should work with extension programs to have VBAs recognized as partners during program implementation. At the closeout of AGRA's financial support, AGRA should initiate a process whereby VBAs are formally incorporated into the public extension program or recognized by local extension offices via memoranda of understanding or other official agreements. (*Public extension pathway*)
- **Focusing on the aspects of the program that are most attractive to youth to encourage them to become VBAs.** This includes branding to increase their visibility in the community, increasing access to technology, and adding special programs for youth, such as loans or grants to start businesses coupled with mentorship aimed at young entrepreneurs to get them through the start-up phase. New programs should also include rapid assessments to identify and fine-tune the specific interventions that work for youth. (*Private sector pathway*)
- **Addressing cultural norms by working directly with community leaders and focusing on women-dominated crops to encourage more women to become VBAs.** AGRA should consider programs to build community-level acceptance of women as VBAs by working in concert with religious and community leaders. AGRA could also support crops and value chain activities that are more traditionally considered women dominated, while also not overemphasizing traditions that limit income-generating opportunities for women. (*Both*)

- **Conducting early assessments of digital platform implementation challenges in order to make course corrections and clarify the strongest likely pathways along the theory of change.** If the VBA program is to be successful, early implementation challenges should be identified and addressed and the pathway for change should be clearly articulated and emphasized to implementing partners, VBAs, and farmers. (*Both*)
- **Promoting improved nutrition and climate-smart practices as a regular part of VBA training.** The VBA program is a key avenue for promoting practice changes, and AGRA should capitalize on the program's reach to promote these practices more broadly. (*Both*)

# Introduction

AGRA is an African-led institution at the forefront of strengthening seed systems, modernizing policies, and linking markets to drive smallholder agricultural transformation. Core aspects of AGRA's model include system-level investments and collaboration with public, private, and nonprofit actors to generate outsized impact. As part of its investments, AGRA has implemented the Village Based Advisors (VBA) program to improve farmers' access to extension, input markets, and output markets. The VBAs are a key part of AGRA's private sector-led extension provision for farmers.

AGRA's VBA program was designed to address a glaring gap in agricultural extension services in Sub-Saharan Africa in which most national extension programs only reach a fraction of rural smallholders. The ratio of extension officers to farmers often exceeds 1:1000, making extension support out of reach for many smallholder farmers.[1] In 2017, AGRA introduced the VBA program in eight countries to address this gap. The program recruits VBAs—skilled farmers known to be respected in their community—and works closely with public extension authorities to train them on good agricultural practices. The VBAs then train farmers in their villages throughout the agricultural season. VBAs also serve as a conduit to input and output markets by connecting farmers to seed and fertilizer suppliers, mechanization services, and offtakers. In the process, VBAs have the opportunity to generate income and even start their own agri-enterprises, which promotes the sustainability of the VBAs and allows them to continue to offer services to farmers in their communities.

As AGRA enters the next phase of implementation, it is important to understand the impact of the VBA program on farmers (their adoption of practices, changes in yields, profit, nutrition, and resilience), the program's impact on VBAs' own practices and finances, and VBAs' effect on the larger last-mile delivery systems in which they are embedded. AGRA and the Bill and Melinda Gates Foundation contracted Mathematica to assess these impacts in two Phases. This Phase 1 evaluation addresses the impact of the program on VBAs themselves, the systems change in which they are embedded and which they influence, and the prospects for the sustainability of the program. (A subsequent Phase 2 evaluation will address the farmer-level impacts through a rigorous matched-comparison design.)

## VBA program overview

AGRA introduced the VBA model to address gaps in the reach of public extension services. By 2022, AGRA trained a total of 39,950 VBAs across eight countries. VBAs were first selected from their communities either through nomination by the community's farmers or by public extension officers with input and approval from farmers. The selected VBAs underwent a series of trainings from extension officials or implementing partners that cover good agricultural practices (GAPs) plus additional training on themes that varied across countries depending on assessments of local needs by program partners. VBAs were then tasked with passing this knowledge onto their farmers through trainings, demonstrations, and advice.

Along with expanding farmer knowledge on effective agricultural practices, the VBA model also aimed to strengthen farmer access to markets and support the income of VBAs. Implementers

[1] TASAI. "TASAI Country Dashboard." n.d. https://www.tasai.org/en/dashboard/country-overview/. Accessed February 20, 2023.

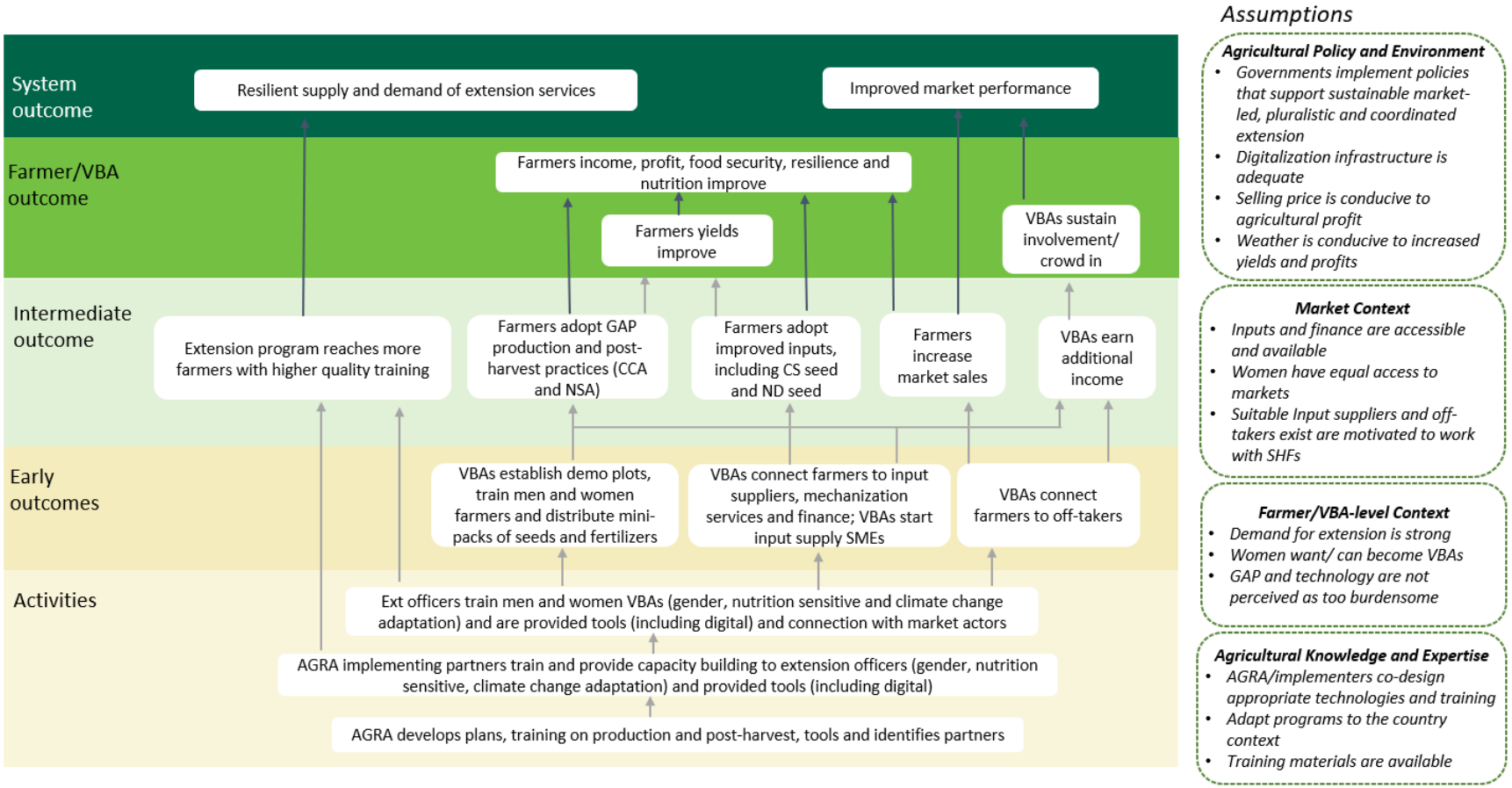
linked VBAs with input suppliers and off-takers to facilitate farmer access to these markets. VBAs are also expected to generate income through commission by selling inputs or aggregating produce or by becoming agri-entrepreneurs themselves. In some countries, such as Tanzania, the program also offered small grants for VBAs to set up input-selling businesses to promote and stock their stores.

## Theory of Change

A theory of change (ToC) is a mapping of the causal pathways that link program activities to the outcomes that program administrators hypothesize will occur when the program is implemented. It also illustrates the external factors and assumptions that need to hold for those causal links to work as hypothesized. Ultimately, a ToC serves as a guide to evaluators, demonstrating what data are required to fully assess the program's impact.

Mathematica worked with AGRA program staff to document the VBA ToC (Figure 1) by fleshing out the causal pathways from designing and conducting VBA training through impacts at the VBA, farmer, and systems levels. In particular, the ToC indicates that the VBA program should lead to an increase in the number of farmers reached by extension services and improved connections between farmers and input and output markets—ultimately raising farmers' yields, income, and resilience. The interaction of the VBA program with the public extension program should bolster the impact of those public services. Linkages with market actors, such as input suppliers and aggregators, should help expand the reach of markets to farmers. As the lynchpin of these vital connections, VBAs themselves should increase their own livelihood opportunities. The ToC also outlines key factors that need to hold in the supporting environment for these linkages to work as hypothesized. For example, yield-enhancing inputs and sufficient access to capital should be generally available for VBAs to sell, and demand for extension services should be strong. This Phase 1 evaluation assessed the strength of the early and intermediate outcome linkages in the ToC, and Phase 2 will assess the impact of the VBA program on farmer outcomes. (See the Findings section below for the ToC assessment.)

**Figure 1. VBA theory of change**




CCA = climate change adaptation; CS = climate smart; NSA = nutrition sensitive agriculture.

# Evaluation approach

## Research questions

The research questions for Phase 1 of the VBA evaluation fall into three groups: (1) program innovations, (2) VBA impacts, and (3) systems-level impacts.

### Program innovations

1. **Innovation of the program**. What best practices and innovations has the VBA model brought to the system that did not exist before? How does the VBA program improve the overall quality of training, interaction with farmers, and connections to market systems?
2. **Digitalization**. What have been the early experiences with digitalizing the VBA program? What other digital tools are VBAs using? What are the lessons for further expanding (or scaling) the digitalization effort?
3. **Program costs**. What are the main cost drivers of the VBA model to governments, implementers, and VBAs across various contexts? If data are available: How do the costs to run the VBA program compare to costs of other programs that promote both GAPs and market access?

### VBA impacts

4. **VBA impact.** How has the program impacted the lives of VBAs, overall and in terms of their income, motivation, and standing in the community? Which factors about the program draw VBAs in and encourage them to continue, and which factors discourage them from continuing with the program? From the VBAs' perspective, what strategies can encourage their own sustainability to continue to engage with the VBA program and model?
5. **Gender and youth**. What are the key differences between the activities of men and women VBAs and youth/non-youth VBAs? For example, how do they differ in terms of farmer reach (gender disaggregated); business approach and participation in business; and their ability to reach out to public extension workers for issues such as updated content, regular trainings, and so on? Are there any important interactions between age and gender that affect outcomes among VBAs and farmers (for example, younger VBAs may better serve women farmers).

### Systems-level impacts

6. **Private sector.** How has the VBA program impacted the input supply and off-taker markets? What are the key incentives for success in terms of increasing farmers' access to markets? What are the incentives and disincentives to continue? What factors contribute to the success of the VBAs (some of whom are agri-dealers, aggregators, agents of seed companies and other service providers, and so on) in connecting farmers with private sector actors, such as input suppliers, finance institutions, and off-takers? Is there evidence that VBAs have created new employment opportunities?
7. **Public sector.** How has the VBA program contributed to changes in the extension and advisory system in a country? What positive and negative outcomes on the extension and advisory system have resulted from implementing the VBA program in each country?

  - What policy and government factors, dynamics, and programs will influence the performance of VBAs (men and women)? How can challenges, negative aspects, and disincentives from these external factors be mitigated? (Challenges could include content, training [including digital], use of farmer-facing channels, and so on.)

8. **Sustainability**. From an institutional perspective, what strategies can sustain private sector-led extension (that is, the VBA model) through the private and public sectors to serve farmers? To what extent has the VBA model been taken up by public and private sector actors?

## Evaluation design

We employed an insight-mining/outcomes-harvesting approach to respond to the research questions. We gathered evidence from a range of stakeholders who interact with VBAs and the VBA program and identified themes, trends, and reported impacts to assess how they vary across contexts and subgroups (such as men/women, youth/non-youth). We based the interview protocols and data collection instruments on the research questions and the ToC, as well as on input from locally-based consultants, and we conducted the interviews between September and December 2022. To supplement the qualitative data, we conducted a phone survey of VBAs across all five countries (Kenya, Nigeria, Mozambique, Tanzania, and Burkina Faso). This survey data allowed us to draw more representative conclusions about some evaluation outcomes, such as the percentage of VBAs who earn an income, the main sources of that income, and how these outcomes vary by age and gender.

## Data collection

**In-depth interviews (IDIs) and focus group discussions (FGDs).** As indicated by the research questions and the ToC, multiple actors interact with and are responsible for the success of the VBA program, and each actor has a unique viewpoint about program impacts on VBAs and systems. To obtain a comprehensive set of perspectives, we interviewed key informants from the following groups: AGRA staff, subject area experts, implementing staff, government extension officials, agronomists, VBAs, input suppliers, off-takers, and farmers reached by VBAs (see Table 1). All IDIs and FGDs interview guides included questions that responded to our study research questions. Locally based members of our research team conducted the interviews in the local language.

**Coding and analysis.** We employed a systematic approach to analyze the qualitative data. Using notes and transcripts from meetings with AGRA and interviews conducted during the design visit, the analysis team identified prominent themes and developed a coding system for each theme or key assumption, actor, or outcome in the ToC. Finally, three analysts assigned codes to the transcripts or in-depth interview notes. They coded transcripts until reaching thematic saturation or the point where no new themes, trends, or data emerged. Table 1 provides an overview of the planned versus actual data collection completed for this report. In most categories we exceeded our target sample.

**Table 1. Qualitative data collection completed to date**

| Contributors | Target sample | Sample achieved | Type of data | Sampling strategy | Purpose |
|---|---|---|---|---|---|
| **Global/cross-cutting** | | | | | |
| AGRA staff | 10 | 12 | In-depth, semi-structured interviews | Identified during inception | To better understand the change pathways, challenges, and program details. |
| Third-party experts | 6 | 10 | In-depth, semi-structured interviews | Identified during inception, snowball thereafter | To identify emerging best practices in the field of extension and market-based solutions, and to better understand common constraints to success in similar programs. |
| **Country-level** | | | | | |
| Government extension program officials | 10–15 | 16 | In-depth, semi-structured interviews | At least 2 in each focus country | To understand the degree to which government programs are familiar with the VBA program, and collect their opinions on the elements of success, challenges, and prospects for adopting VBA-type approaches in the national model. |
| Implementing partner staff | 10–15 | 15 | In-depth, semi-structured interviews | At least 2 in each focus country | To better understand the challenges faced in implementing the program, the sustainability pathways, and coordinating with the private sector government extension program. |
| Agronomists | 5 | 4 | In-depth, semi-structured interviews | At least 1 in each country; these may sometimes overlap with other interviewees, like government officials | To better understand the agronomic context of the key crops and regions (for example, how responsive certain crops are to practice versus input changes). |
| VBAs | 80 | 88 | In-depth, semi-structured interviews | 16 in each country, of which 6 are in regions with digitalization; equal parts women and men and younger and older VBAs, as is possible | To obtain viewpoints on challenges and best practices, and perceptions of impact, sustainability, and related research questions. |
| | 1,000 | 1,032 | Phone-based rapid surveys | 200 in each country, of which 100 are in regions with digitalization, where possible; equal parts women and men and younger and older VBAs, as is possible | To obtain a larger amount of representative information on how VBAs are benefiting from participating in the program, such as increases in income or social capital and the sustainability of the program. |

| Contributors | Target sample | Sample achieved | Type of data | Sampling strategy | Purpose |
|---|---|---|---|---|---|
| Farmers | 20 FGDs (120–160 farmers) | 35 FGDs (≈240 farmers) | FGDs | 4 FGDs of 6–8 farmers each, half women only/half men only | To better understand farmers' impact pathways and their experience with the VBA program thus far. To inform the quantitative data collection efforts. |
| Input suppliers | 15 | 18 | In-depth, semi-structured interviews | 3 per country, identified by VBAs and AGRA country office | To understand the degree to which VBAs have success working with input suppliers, factors related to sustainability and systems change, and challenges in working with VBAs. |
| Output buyers | 15 | 17 | In-depth, semi-structured interviews | 3 per country, identified by VBAs and AGRA country office | To understand the degree to which VBAs have success working with output buyers, factors related to sustainability and systems change, and challenges in working with VBAs. |

Note: Sample to date includes data collected as of December 12, 2022.

FGD = focus group discussion; VBA = village based advisor.

**VBA phone survey.** The IDIs and FGDs allowed us to gather nuanced and unanticipated insights to better understand the relationships between activities and outcomes and the reasons that the program might or might not achieve the outcomes described in the ToC. We supplemented these data with a short phone survey of approximately 1,000 VBAs to obtain more representative opinions on challenges in reaching farmers, experience working with government extension programs, operational challenges, and the long-term business case for the program, among other topics.

Table 2 provides an overview of the survey sample including the total sample for each country broken out by the percentage of women and youth respondents. The table also compares our sample to the total number of women and youth VBAs reported by AGRA. We attempted to increase the proportion of women and youth in our survey sample by oversampling these respondents, but in some countries this proved challenging. For example, in Mozambique and Burkina Faso, the survey firm found it very difficult to locate women VBAs over the phone. In these countries, it was also difficult to set targets for surveying young VBAs because we did not have complete data on the percent of VBAs who were under 35 years old.

**Table 2. Total survey respondents and percentages of women and youth in the VBA population compared to the phone survey sample**

| | Burkina Faso | | Nigeria | | Kenya | | Tanzania | | Mozambique | | All countries | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total survey respondents | *200* | | *200* | | *229* | | *200* | | *203* | | ***1,032*** | |
| | *VBAs* | *survey* | *VBAs* | *survey* | *VBAs* | *survey* | *VBAs* | *survey* | *VBAs* | *survey* | ***VBAs*** | ***survey*** |
| Women | 38% | 25% | 21% | 41% | 56% | 54% | 29% | 48% | 20% | 14% | **30%** | **38%** |
| Youth | 47%* | 21% | 55% | 50% | 11% | 14% | 19% | 38% | 37%* | 23% | **39%*** | **29%** |

Source: VBA phone survey December 2022.

* We did not have complete data on the percent of youth who were in these countries. Data on youth status was missing for 74% of youth in Burkina Faso and 39% in Mozambique.

### Limitations

While we have taken care to use the most rigorous methods possible for this evaluation, the study design and data collection process still faced some limitations. This report relies on qualitative and descriptive data and cannot make causal claims about the impact of the program on VBAs, farmers, agricultural extension systems, and private sector markets. Instead, our findings highlight the perceived outcomes of the program, the potential pathways these outcomes were achieved, country-specific contexts, and implementation strengths and challenges. As noted previously, we used systematic methods to record, transcribe, and analyze the IDIs. In some cases, recordings were not possible and we used detailed notes instead. For Mozambique, approximately 50 percent of the recordings were lost due to a technical malfunction, so we conducted the analysis with the notes.

Additionally, for our survey data, some of the questions required respondents to recall information from the recent past, and, as such, these responses are subject to recall bias. Because this was a phone survey, respondents were more likely to own a phone and might have had more favorable attitudes to the VBA program because they took the time to answer questions. Our survey was also not specifically powered to make a large number of comparisons between respondents in different countries, and the samples size for some of our subgroup analyses are small and may not be sufficient to detect statistically significant differences in all cases.

## Findings

### Program innovations

In our interviews with key stakeholders, we found that the VBA program has operated as designed and has been effective in extending the reach of public extension programs. Our phone survey indicates that approximately 80 percent of VBAs who responded to the survey remain active. In all studied countries (except for Kenya, which AGRA officials noted has a higher-functioning market), the VBA model operated through consortia of nongovernmental organizations and private sector implementing partners. Implementing partners trained extension workers and VBAs on good agriculture practices, seeds, and input use. In some cases, trainings also covered business or marketing skills and postproduction processes. VBAs then passed the knowledge on to the farmers with whom they work. According to AGRA officials and

implementing partners, in all countries aside from Mozambique, VBA market and training activities focused more on linkages to input providers than to off-takers. In contrast, the VBA program in Mozambique appears to have focused more on training farmers for aggregation than the other four countries.

In Tanzania, Mozambique, Nigeria, and Burkina Faso, AGRA is also implementing the digital application CropIn (or SmartFarm in some countries). A primary purpose of digitalization is to improve the efficiency of communication between VBAs and farmers on market and farming practices and to increase the linkages between VBAs and farmers with market actors. AGRA officials and implementing partners indicated that rollout of the CropIn application is still in its early stages. However, VBAs reported using other digital tools in their work, such as WhatsApp and Facebook, and other agriculture-related digital applications.

### VBA selection

**VBAs are intentionally selected because they live in the communities where they serve, and they are considered to be entrepreneurial and dependable.** Implementers and public extension officers report that a key innovation of the program is that VBAs are selected for their farming skills, their standing in the community, and their entrepreneurship, which is helpful as they are tasked with building connections to markets. Another key aspect is that VBAs serve the communities where they live. This makes them more accessible to local farmers than traditional government extension workers, who may not necessarily come from the region where they work and are also typically responsible for much larger geographical areas and many more farmers than VBAs. Indeed, farmers in our focus groups reported meeting much more frequently with VBAs than with public extension officers. Outside of organized meetings, farmers in Burkina Faso and Nigeria particularly felt that they could also easily reach out to their VBAs face-to-face or over the phone to seek additional advice and information.

> *We had extension agents but they are not effective like the [VBA]. When I have a problem and call [the extension agent], he comes occasionally. But if I contact the [VBA] through the WhatsApp platform or normal call, I get a response immediately and the problem will be solved but, in a case where they are not able to, they make referrals.* (Farmer, Nigeria)

**Another advantage of VBAs' proximity to the communities they serve is a deeper understanding of local issues and agricultural challenges.** Extension officials in Tanzania and Kenya described that VBAs deliver more locally relevant trainings and solutions. In Burkina Faso and Mozambique, implementers and program participants found that VBAs helped remove language barriers between farmers and public extension officers through their knowledge of local languages spoken within their community. Stakeholders also reported that, due to the closer relationship between VBAs and farmers, farmers are often more willing to take the VBAs' advice and guidance. One input provider in Nigeria noted:

> *With this [VBA model], we have a lot of [VBAs] going out there, meeting a … smaller number of farmers. So they are able to meet farmers within a very short [time] period. And there is an element of trust between them and the farmers because they live in the same community. They see the [VBA] every day and they communicate, so they are easily accessible by the farmers. Farmers can easily talk to them.* (Input provider, Nigeria)

In many cases, the role of the community and the public extension officers in selecting VBAs appeared to be an important aspect of the program to ensure that VBAs were recognized and respected by their community. The degree of community engagement varied across countries, but all farmers ultimately had some say in who would serve as their VBA. For example, in Nigeria, communities nominated farmers to serve as their VBA based on VBA selection criteria shared with them by program implementers. In Kenya, the community played a smaller role in VBA selection. Ward officers and program implementers mainly selected farmers to go through VBA trainings, with guidance from community leaders and field staff. Local farmers were able to veto the selection if they objected. In Burkina Faso, Tanzania, and Mozambique, the selection process was a mix of either community nomination or selection by extension officers. VBAs selected by extension officers tended to have been active in prior agriculture programs in the area or were already recognized by extension staff as lead farmers and as having an interest in learning.

While VBAs should ideally also be selected for their entrepreneurial skills, this aspect of the process appeared to be less consistently followed and was not stressed as much as the selection criteria to be a skilled farmer who is well respected in the communities. Other programs that implement similar agri-entrepreneur models have a stricter selection process that can require paying for some of the training costs or implementing psychometric testing and other tests to assess how well networked and literate or numerate potential participants are.

### VBA activities

**According to VBAs and farmers, demonstration plots and seed packs were the primary ways that VBAs encouraged farmers to adopt GAPs.** VBAs who were trained to create demonstration plots highlighted improved seed varieties and planting practices, such as intercropping and planting in lines, as critical benefits of the program. VBAs also distributed seed "tester packs" to farmers with a small amount of seeds that would allow farmers to try out a new variety on a small plot of land. Implementers referred to these practices as "seeing is believing" because the demonstration plots allowed farmers to see for themselves the productivity and yield increases from the new practices and improved inputs. In contrast to past programs in VBA intervention areas that focused mainly on input provision, the AGRA VBA model trained farmers on the effective use of inputs, GAPs, and postproduction processes.

> *When … other projects came, they gave us seeds and fertilizer, and then they promised to come back to buy our crops…. With the VBA program, we received training. This is not the case with other projects. (Farmer, Burkina Faso)*

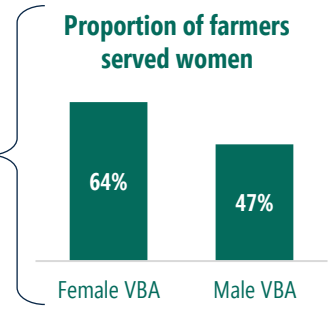
The combination of VBAs being embedded in their communities with demonstrations of improved agricultural practices can be particularly effective by making the impacts clearly visible. For example, in Kenya, the VBAs introduced a short-maturing maize seed that was previously unknown and allowed farmers to plant during the short rains to improve their annual yields. The visible success of this seed interested farmers and attracted them to the program.

**On average, the program reaches 130 farmers per VBA and VBAs are in contact with their farmers around two and half times per month.** Survey data show that VBAs who are active work with a much smaller number of farmers than local agricultural extension agents and have fairly frequent contact with them (Table 3). Around half of the farmers working with VBAs were

women, though this varied by country. In addition, women VBAs were much more likely to work with women farmers.

**Table 3. VBA contact with farmers**

| | Burkina Faso | Nigeria | Kenya | Tanzania | Mozam-bique | All |
|---|---|---|---|---|---|---|
| ***N*** | *162* | *155* | *205* | *159* | *172* | ***853*** |
| **Number of farmers served over the past 12 months, if the VBA is active** | 121 | 73 | 179 | 129 | 136 | **131** |
| **Proportion of farmers served women** | 49% | 38% | 66% | 52% | 53% | **52%** |
| **Number of times contacted or trained farmers in the last month, if VBA is active** | 1.7 | 2.2 | 3.0 | 3.3 | 2.6 | **2.6** |




Source: VBA phone survey, December 2022.

N = 853.

**Climate change adaptation and nutrition were not emphasized as explicit training components in any country other than Kenya.** However, VBAs in other countries did train farmers on practices that could promote resilience**.** In Kenya, VBAs in some areas taught farmers regenerative agriculture practices to promote soil health and water conservation and nutrition-sensitive farming practices, such as establishing kitchen gardens with indigenous vegetables. Farmer education on these cross-cutting themes enhanced the impact of other program activities, such as training on GAPs and improved inputs. As one implementing partner in Kenya noted:

> *In these mother/baby demos as we promote the RA [regenerative agriculture] technology, we are also coupling it with the GAP. We have a case-a VBA was able to harvest 327Kg of maize from a 600M2 demo plot. So, they were able to see with good spacing, good crop management from a very small potion, you are able to get high production.* (Implementing partner, Kenya)

These practices were less central to VBA training in other countries and not an element of training often highlighted by VBAs or implementers. However, VBAs promoted some practices that have the potential to enhance farmer resilience. For example, farmers received up-to-date information on weather patterns to inform the best times for various farming activities. In Burkina Faso, some farmers learned how to create water retention basins and received irrigation pumps to conserve water in case of drought. In Mozambique, although trainings did not necessarily refer explicitly to "climate change," VBAs advised farmers on practices to maintain soil health, such as minimal tillage and practices to mitigate damage from weather events (such as flooding).

### Market access

**Stakeholders also highlighted improved input availability as a key innovation.** The program linked input suppliers, VBAs, and farmers in a virtuous cycle that provided farmers access to improved inputs, VBAs a potential income stream, and input suppliers an expanded market.

Through these links, VBAs were able to provide inputs to farmers in areas that were less often reached by input suppliers. Prior to the program, farmers from those areas had to incur high travel costs to access these inputs. Farmers further noted that they were able to access high-quality inputs more readily and in some cases at lower prices through the VBA connections. As one farmer explained:

> *This project has also helped us a lot, especially with fertilizer prices. On the market fertilizer costs 30000 FCFA. With the program, it costs only 12000 FCFA.* (Farmer, Burkina Faso)

The trust between VBAs and farmers helped accelerate this process. For example, stakeholders in Kenya reported that the solid relationships between VBAs and farmers made farmers more willing to pay VBAs in advance for inputs and trust that they would supply the inputs after purchasing them from suppliers.

### Digitalization

**Implementation of the AGRA-funded CropIn/SmartFarm app has been limited, as it is still in its early phases.** A planned program innovation was for VBAs to use specialized digital applications to augment their ability to reach farmers and share information more efficiently. However, the rollout and uptake of CropIn/SmartFarm in countries where it is being promoted has been limited. At the time of our data collection, Burkina Faso, Nigeria, and Mozambique were in the process of rolling out training, whereas trainings had been completed in Tanzania. In Tanzania, few VBAs reported using CropIn because they perceived the training to be too short for them to grasp all the functions. Respondents also reported that a main challenge in most countries was the lack of widespread mobile phone access, especially smartphones and more specifically the model of smartphone required to use CropIn. Even in cases where VBAs own or can access a smartphone, limited network connectivity, inconsistent supply of power needed to charge smartphones, and costly data and internet plans further hindered uptake. Respondents frequently suggested that digitalization initiatives could be improved through making the application as simple as possible.

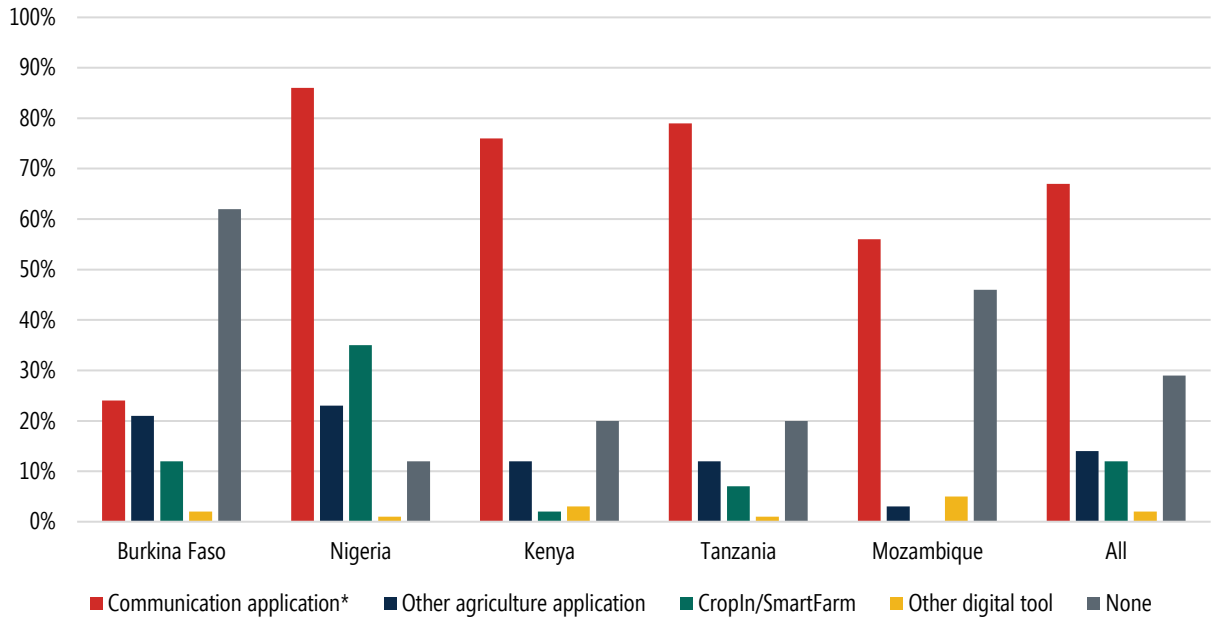
> *I think it needs to be very user friendly in terms of easier to be accessed. Because if it's complicated and you know the level most of farmers would be challenging for them to, to adopt.* (AGRA staff, Tanzania)

**Despite the limited use of AGRA-supported digital applications, many VBAs have experience using other digital platforms.** In Kenya, AGRA promoted Agribot for a limited period of time and trained 9,000 VBAs in its use. Implementers found this application to be helpful for VBAs to provide useful information (such as weather or market updates) to multiple farmers at once but noted that communication was limited since farmers could not send messages back to VBAs. Funding for this platform, however, has ended, and the VBAs we interviewed reported no longer using it due to limited support post program. Program partners have also introduced other platforms with similar and additional services. In Tanzania, several extension officers use and have trained VBAs on M-Kilimo to communicate extension and market information with farmers. In Nigeria, implementing partners introduced VBAs to an application that allows them to measure farmers' plots using GPS and another to register farmers and track their activity.

**VBAs also use social media such as WhatsApp groups and text messaging to facilitate communication between farmers, VBAs, and market actors.** Outside of agriculture-specific digital platforms, VBAs and farmers frequently noted that the use of WhatsApp groups, text messaging, and phone calls made information sharing easier overall. VBAs could also use these platforms to quickly respond to farmers' questions about GAPs or any other challenges they were facing. Some farmers even shared photos of issues in their plots over WhatsApp to ask VBAs for targeted advice. The program took advantage of remote communication during the COVID pandemic to allow VBAs to continue holding trainings and sharing information digitally while in-person gatherings were restricted.

**Survey data are mostly consistent with interviewee reports showing limited use of CropIn at the time of survey but high use of other communication applications**. As shown in Figure 2, VBAs more frequently use a communication application or other digital tool over AGRA-funded CropIn/SmartFarm. Particularly in Nigeria, Kenya, and Tanzania, a large share of VBAs use digital tools. In Burkina Faso, however, only 38 percent of VBAs reported using any digital tool or application. In Mozambique, no VBAs reported using CropIn since the process was only at the Training of Trainers stage at the time of survey data collection.

**Figure 2. Use of digital tools (among phone survey respondents, in percentages)**




Source: VBA phone survey, December 2022.

Note: These results are weighted by gender and age. Communication applications include SMS, WhatsApp, and Facebook Messenger. Other agricultural applications include specific country-based applications such as M-Kilimo, Agrodealers, NIMET Meteorological, ODK Data collection, Agribot, GPS, and FARMEX. Other digital tools include search engines and cash transfer applications.

N = 1032.

**Interviewees noted that smartphone technology is used more by youth and men farmers.** According to implementers and partners in Burkina Faso, women tend to own smartphones less frequently than men. Respondents in Burkina Faso and Nigeria also found that elder farmers faced more challenges with grasping the platform functionalities.

**The main opportunity for digitalization is likely in strengthening the links between VBAs and market actors rather than in training farmers on improved practices.** Agricultural experts and some program implementers were skeptical that digitalization of smallholder farmers would accomplish its objectives around more efficient communication between VBAs and farmers because access to smartphones among farmers is limited and trainings are more effective when conducted interactively. They suggest that there could be greater opportunity in using digital platforms to create a virtual marketplace that helps VBAs track their business activities and share that data with input sellers and offtakers in order to better manage stocks of input supplies and even extend credit. For example, in Burkina Faso, digital platforms facilitated communication between VBAs and input suppliers about input availability and demand. As one market actor noted:

> *We can say that the phone has made the work easier because it is not easy to travel. As soon as fertilizers are available in our stores, the agricultural presidents (local leaders in agriculture) are called and they come to do the sampling for the various producers. It is the presidents who know the hectares under cultivation. The telephone allows me to get in touch with the agricultural presidents and they in turn contact the VBAs on the phone. I don't have a direct link to VBAs.* (Market actor, Burkina Faso)

**Program costs**

**Collecting precise data on the costs of implementing the VBA program proved to be a challenge**. We relied on AGRA and implementing partner-provided budgets to estimate program costs, but it is difficult to distinguish the VBA costs from the costs of other AGRA activities. For our analysis, we relied on cost data that mainly consisted of budgets and/or expenses for consortium contracts within those countries as well as reports from program implementers on their main cost drivers (see Appendix A). Cost information related to AGRA's oversight and management of VBA implementation contracts and precise information on costs borne by VBAs (transportation, opportunity costs, expenses related to setting up businesses, and so on) was not available.

**Implementers in all program countries reported that training is the biggest cost driver of the program.** They highlighted acquisition of inputs for input kits and establishment of demo plots as the main costs related to training. In analyzing cost information received from implementing partners, we confirmed that most of the costs reported were related to preparation and supplies for and provision of trainings. There were other costs related to holding recruitment events and meeting with government officials and market actors. However, training costs were by far the largest component of the VBA budget.

**The cost per VBA and cost per farmer served varies between countries, with an average cost per VBA of $853 and an average cost per farmer served of $3.36.** The program costs, which include the costs of recruiting, training, and supporting VBAs during program implementation, are highest in Mozambique mainly due to larger distances between farmers and higher transportation costs (Table 4). These figures suggest that the total cost of the VBA

program is well below the cost of public extension agents, which one expert estimated to be around $10,000 per year per extension agent. However, any program costs should ultimately be compared to the monetized benefits as part of a larger cost-benefit evaluations (which will be conducted in Phase 2 of this evaluation) to truly understand the value of any investment in the program.

**Table 4. Cost, cost per VBA, and cost per farmer, by country**

| Country | Total cost | Number of VBAs | Number of farmers | Cost per VBA | Cost per farmer |
|---|---|---|---|---|---|
| Kenya | $681,892 | 1,751 | 280,753 | $407 | $2.54 |
| Tanzania | $724,810 | 5,033 | 693,096 | $144 | $1.05 |
| Mozambique | $5,012,854 | 2,288 | 775,504 | $2,191 | $6.46 |
| Burkina Faso | $4,934,231 | 4,293 | 974,214 | $1,149 | $5.06 |
| Nigeria | $2,081,313 | 5,554 | 1,221,923 | $375 | $1.70 |
| **Totals** | **$13,435,100** | **18,919** | **3,945,490** | **$853** | **$3.36** |

Note: Costs are in U.S. dollars.

**The VBA program is less expensive than the comparator program for which we had available data.** Table 5 covers programs that experts have named as comparators to AGRA's VBA model because they also promote both GAPs and market access. Several models, such as Sasakawa Uganda's Community Action Traders and the Village Agent Model in Uganda, offer very similar supports: community-based lead farmers who supplement extension agents by offering supports to farmers (including linkages to seed suppliers and off-takers) and promote practices to increase agricultural production. Information on cost per VBA and cost per farmer for these programs is limited, and cost similarities to the AGRA VBA model largely depend on the country of comparison, since there is variation in costs between countries. However, AGRA's VBA program appears to be less expensive per farmer and per VBA than this particular list of comparator programs.

**Table 5. Comparator programs**

| Program | Brief description | Cost per advisor | Cost per farmer |
|---|---|---|---|
| **Programs that are highly similar to VBA** | | | |
| Sasakawa Uganda—Community Association Traders (CATs) | CATs are village-based advisors to farmers on good agricultural practices who also are linked to seed suppliers and off-takers to increase farmers access to markets. CATs earn a commission. **High** level of similarity when compared to AGRA VBA model, with a smaller scale of reach. | ~ $1,250 per VBA[a] | Not Available |
| Village Agent Model (Uganda) | The Village Agent Model is a private sector-driven approach to agricultural value chains that uses agricultural produce marketers to help farmers increase their production by training 32,000 village agents in three years, or one village agent per 181 agricultural households. Funded partly through government levies and taxes (traders and farmers), but there was widespread concern that this would derail implementation. **High** level of similarity when compared to AGRA VBA model. | Not available | $31.05 per direct beneficiary |
| **Programs that are moderately similar to VBA** | | | |
| Farm to Market Alliance—Farmer Service Center | This program trains selected agri-entrepreneurs to start a Farmer Service Center serving 150–200 farmers at the village level with various inputs (fertilizer, seeds, soil testing, mechanization) as well as connection to produce buyers. All agri-entrepreneurs make some income from the program. **Medium** agri-entrepreneurs level of similarity when compared to AGRA VBA model, with more intensive support and focus on the agri-entrepreneur aspect. | Not Available | Not Available |
| Syngenta (Agri-Entrepreneur [AE] program, India) | AEs act as one-stop resource for providers by supplying access to high-quality inputs, offering knowledge and advise on crops, and facilitating market linkages and credit to 150–200 farmers each. **Medium** level of similarity when compared to AGRA VBA model, with a larger focus on rural youth and entrepreneurship and more intensive AE selection and business development supports. | $1,585 per AE | $5.80 per farmer[b] |
| Syngenta (Farmers Hubs) | Farmers' Hub is a one-stop commercial service platform designed by Syngenta Foundation for Sustainable Agriculture to facilitate access to high-quality inputs, machinery, markets, finance, and knowledge sharing. Hubs are close to farms but typically far from formal markets and serve 500–1,000 farmers each and link them to 10-20 buyers. Farmers' Hub operators earn revenue by trading farmers' products, selling inputs, and renting machinery and facilitating postharvest handling. **Medium** level of similarity when compared to AGRA VBA model, with differing focus on access to agri-machines, markets, and finance. | Not available | Not available |

| Program | Brief description | Cost per advisor | Cost per farmer |
|---|---|---|---|
| iDE (Cambodia) | Farm business advisors provide farmers in remote areas with access to higher-quality inputs and technology. They advise on improved agricultural practices and business skills, including crop diversity, planting tactics, water storage, postharvest storage, and market strategies. **Medium** level of similarity when compared to AGRA VBA model, with a larger focus on providing links between farmers and suppliers in remote areas. | ~$200 per advisor | Not available |
| Farm Input Promotions Africa Ltd. (FIPS-Africa) | FIPS trains VBAs on good crop/soil management, climate-smart technologies, and how to make money from input supply and related services. VBAs generate income through input supplying and offering their services to farmers. In addition, FIPS has developed partnerships with seed and fertilizer companies in the region who provide inputs to VBAs and conduct product demonstration to generate demand. **Medium** level of similarity when compared to AGRA VBA model, with a larger focus on food security and provision of services by FIPS trained VBAs includes livestock inputs and services, as well as seed production (not just sales). | Not available | Not available |
| **Programs that are only somewhat similar to VBA** | | | |
| One Acre Fund (1AF) | 1AF field officers are salaried employees of 1AF who provide training as well as inputs on credit, all of which are provided by 1AF. 1AF is partially funded by farmers' interest payments on loans as well as by donors. **Low** level of similarity when compared to AGRA VBA model, since field officers are salaried employees and 1AF procures and distributes inputs and provides credit. | Not available | $32.72[c] per farmer |
| myAGRO | myAgro provides employment opportunities through the commission-based Village Entrepreneur (VE) program. Equipped with a smartphone and myAgro's mobile applications, village entrepreneurs responsibilities include marketing myAgro inputs to farmers, helping farmers select the right package for their farms, and monitoring farmers' progress toward their layaway goals. They also do agricultural training. **Low** level of similarity when compared to AGRA VBA model, as VEs are connecting farmers to guaranteed inputs and delivery through myAGRO, not local seed companies/agri-dealers. | Not available | $74.22[d] per farmer |

Note: Costs are in U.S. dollars.

[a] Very rough estimate based in interview with Sasakawa official who report the number of VBAs and total program costs. These costs per VBA could go down if the program scales.

[b] Based on correspondence with program officials. These estimates are based on program costs, however, AE themselves invest an additional $1,526 in start-up costs, $305 of which is provided as a loan. If these costs are considered, the per farmer costs are $13.40 per farmer.

[c] Based on 2018 data, analysis from The Life You Can Save. These are donor costs per farmer served.

[d] Calculated using financial report from 2021 on foundation and government grants and annual report for estimates of farmers reached.

## VBA impact

VBAs reported that the primary pathway for earning additional income was from improved productivity on their own farms. Some VBAs were also able to earn incomes through agri-dealing, although only a small share were able to start agribusinesses, and the level of market development and infrastructure affected the ability of VBAs to earn income from input selling and off-taking. Across countries, the main challenges VBAs faced were the lack of access to finance and high transportation costs that limited their ability to pursue market opportunities. They also bore significant time burdens in providing extension services to farmers. Despite these challenges, VBAs were motivated to continue in their role by improved harvests, both for themselves and the farmers in their communities, as well as the income they earned as input sellers and agribusiness owners.

The VBA Program had a particular focus on women and youth. For example, each country aimed to have around 30 percent of VBAs be women. However, women VBAs face long-standing social and cultural norms that affect their recruitment and retention. They also have higher household time burdens and mobility challenges in their roles. Although youth are more difficult to retain as VBAs due to the lure of more lucrative opportunities and lack of land access, implementers find them to be skilled trainers because they seem quick to absorb and disseminate new agricultural knowledge.

### Income

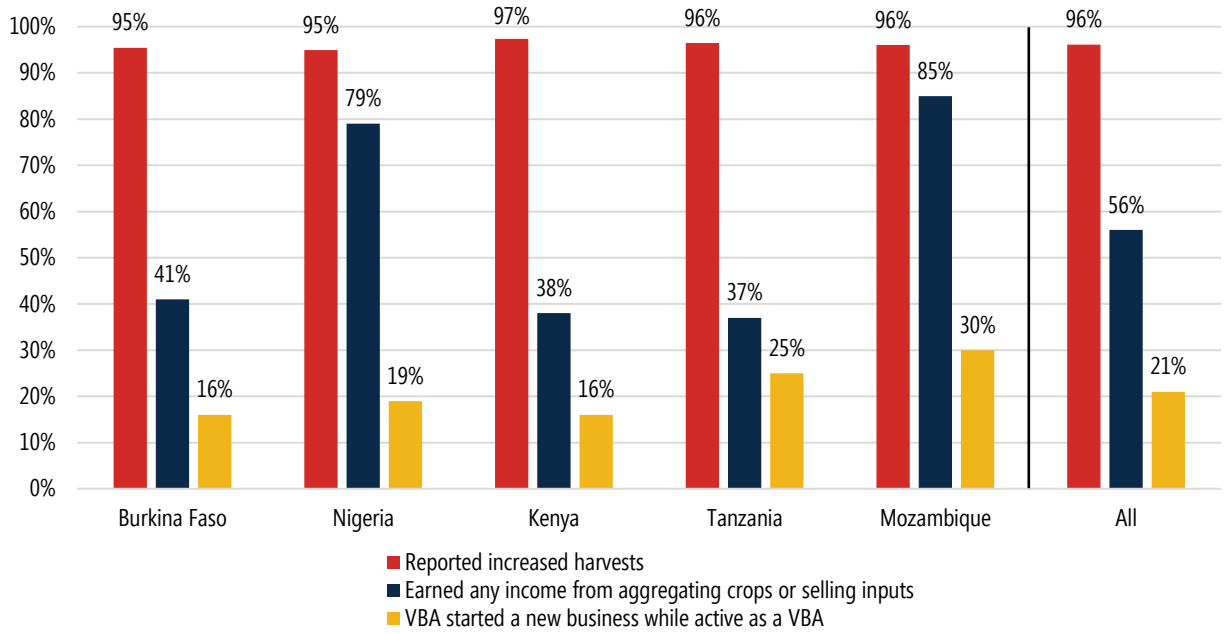
**Higher agricultural productivity is the main avenue of income for VBAs.** While the VBA program ToC anticipates that VBAs will earn additional income through a variety of means, such as improved connections to input suppliers, off-takers, and mechanization services, as well as starting their own agribusinesses, the most frequently cited reason for increased income was improvements to their own harvests. This was also backed up by the VBA survey data (Figure 3), which indicates that most VBAs reported harvest improvements from the program (96 percent across countries). After adopting the good agricultural practices learned during trainings, VBAs reporting increasing their yields enough to sell their surplus harvest. VBAs in Kenya and Burkina Faso reported using new storage techniques, which decreased crop waste and allowed VBAs to sell their crops when market prices were favorable. As a VBA in Tanzania noted:

> *Myself, I like [being a VBA] because even before AGRA project I used to grow maize, I used to cultivate one acre and get 2 bags (100kg each). But when AGRA came and educated me on good agricultural practices focusing on timely planting, use of improved inputs and timely application of the inputs, I tried to apply the knowledge, they gave me on a small plot as demo plot. It was very small but what I got from it was amazing, I got 2 bags of maize, I thanked God, that was something very new to me…. In the season 2020/2021, I cultivated 2 acres and got 43 bags of maize, I really thank God, I have never experienced such a huge amount of maize, I lived a satisfying life.* (Woman VBA, Tanzania)

**Just more than 50 percent of VBAs reported earning income from aggregating and/or input selling, although this greatly varied across countries.** In Mozambique and Nigeria, more than three-quarters of VBAs in the survey reported income from selling inputs or aggregating compared to less than 40 percent in Tanzania, Kenya, and Burkina Faso (Figure 3). An even smaller share of VBAs reported starting a new business (21% across countries).

However, VBAs in Mozambique also appear to have had greater success in starting agribusinesses compared to those in other countries (Figure 3).

**Figure 3. Percent of VBAs with improved harvests, income, and new businesses (percentage among phone survey respondents)**



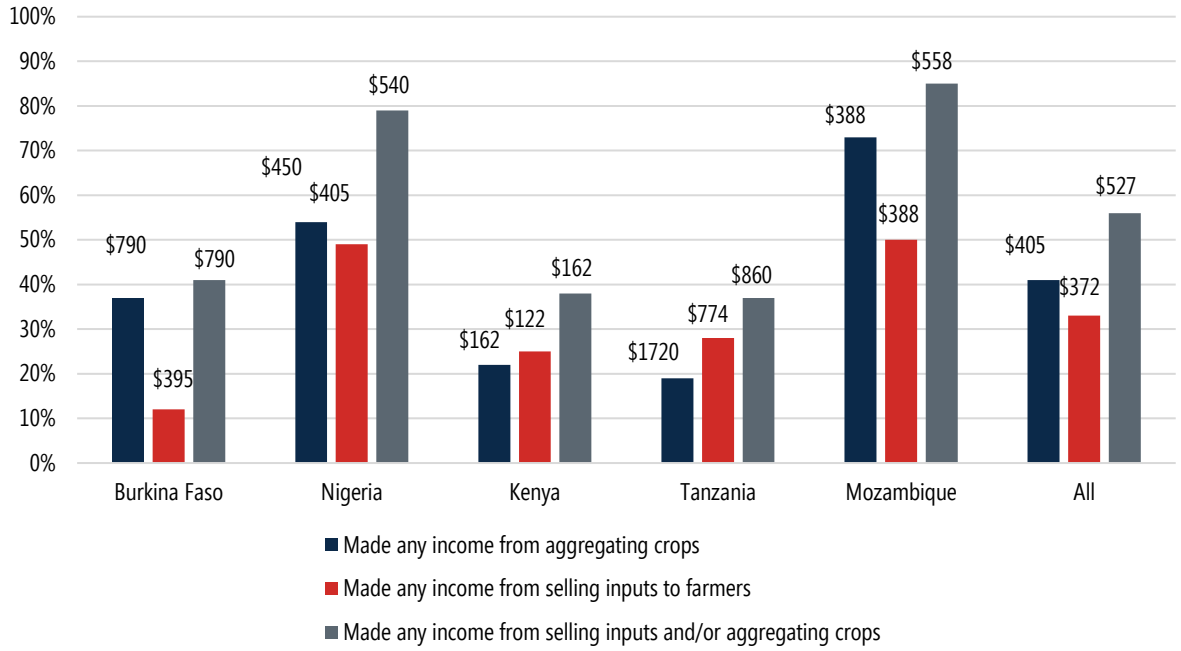

Source: VBA phone survey, December 2022.
N = 1,032.

**For the roughly half of VBAs who reported earning any income, the median income across countries was $527 annually** (Figure 4). We note that self-reported annual income can be unreliable, particularly over the phone and where earnings are irregular—as they often are for VBAs. In addition, there are notable outliers reporting very high income in each country (see Appendix B), and that is why we report the median rather than the mean. Finally, it is important to note that this is reported income and not reported profits, so it does not allow us to know if these activities are profitable after accounting for VBA investments.

**According to VBAs and implementers, more VBAs were involved in selling inputs than aggregating crops in all countries except for Mozambique.** VBAs reported that they typically sold inputs for companies or hub agri-dealers that AGRA introduced and earned a small commission on the sales. For example, many interviewees reported that VBAs in Nigeria often served as commission agents for large seed companies. Some of the VBAs and the farmers they worked with also became out-growers for seed companies, selling the grains they produced from seed inputs back to seed companies. However, in contrast to findings from qualitative interviews, VBAs from the phone survey who made an income from the program reported a slightly higher participation in aggregation than input selling (Figure 4). This contradiction may be due to the higher likelihood of more entrepreneurial VBAs having more continual access to phones and thus being more available to respond to survey questions. These VBAs also reported earning slightly more from aggregation ($401) than input sales ($372), which is known to have higher

profit margins. Interviewees suggested that if VBAs can break into aggregation, they may be more likely to remain in their role in the long run.

**Figure 4. VBA self-reported income from selling inputs and aggregating crops, by country (percent of VBAs who made any income and median incomes out of VBAs who made any income, among phone survey respondents)**




Source: VBA phone survey, December 2022.

N = 1,032.

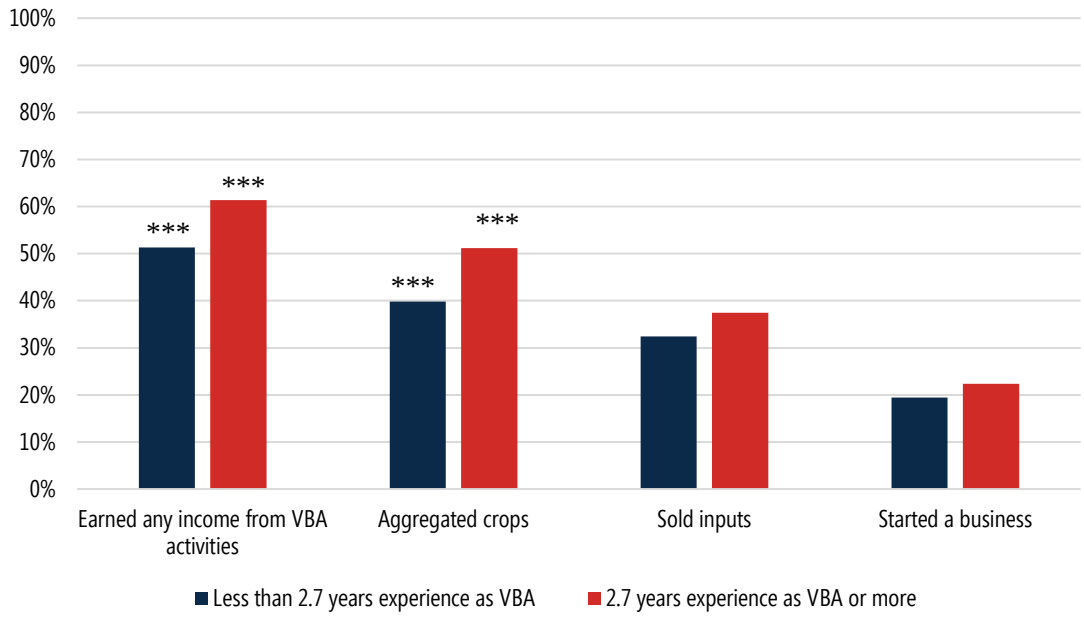
**Contextual factors, such as level of market development, affect the degree to which VBAs find success in income-generating activities.** The level of input and output market development in each country is likely an important factor in VBAs' ability to generate income from private-sector activities. According to several experts, markets that are less developed may provide more opportunities for VBAs to be successful. In Mozambique, VBAs were able to leverage the relatively less developed village-level input and output markets to establish themselves in the market. Stakeholders explained that the farmers VBAs serve are from remote villages with neither existing local input or output markets nor access to urban markets. On the other hand, in Kenya, where there is already high penetration of agri-dealers in rural areas, VBAs who wanted to sell inputs or establish agribusinesses faced more competition.

**For aggregation activities, infrastructure in each country appears to play a critical role for VBA success.** In Mozambique, stakeholders explained that collection centers and warehouses that were already established prior to the program in most villages allowed VBAs to easily aggregate farmer produce. In Nigeria, VBAs from areas where collection centers were built by program implementers reported being involved in aggregation activities. In areas where such infrastructure did not exist, VBAs suggested that future programs invest in building local warehouses and collection centers.

**In addition to market factors, VBAs in Kenya, Tanzania, and Nigeria who wanted to start input shops reported being hindered by business licensing costs.** For VBAs in Tanzania, this licensing process was especially cumbersome. Not only did VBAs have to pay separate training fees for each type of input they wanted to sell, but they also needed to be trained by the respective input regulatory authority and pay an annual fee for license renewal.

**The involvement of VBAs in private-sector activities may also be tied to their level of experience.** Survey data indicate that VBAs with more years of experience were more likely to earn income from VBA activities such as aggregating crops (Figure 5). Although the difference for more experienced VBAs selling inputs and starting a business were not statistically significant, the trends are consistent with qualitative data on the importance of trust in establishing working relationships with input providers, offtakers, and farmers.

**Figure 5. VBAs' income-generating activities by experience level (percent of VBAs among phone survey respondents)**




Source: VBA phone survey, December 2022.

* indicates statistical significance level of p<0.05,

** indicates statistical significance level of p<0.01,

*** indicates statistical significance level of p<0.001.

N = 1,021.

**Some VBAs also earned additional income by providing other agricultural services, such as pesticide spraying, plowing, and threshing;** however, survey data found that this was less than 10 percent of VBAs. In Nigeria, some women VBAs also reported earning additional income from postharvest processing and value addition (mainly rice processing and soya bean processing). These VBAs mentioned that they were able to make money from processing rice and producing soya milk—skills they learned from AGRA trainings. Some VBAs in Tanzania and Mozambique engaged in post-harvest activities such as maize and soy shelling. Some of

these VBAs reported using their profits from postharvest processing to further invest in agricultural inputs and farming.

> *My income increases because of the CBA program and my business income increases too, before in a month to get 5000 Naira is an issue but now I can get even up to 25000 to 30000 in a month. My most income comes from the processing of the grains.* (Woman youth VBA, Nigeria)

### Motivation

**VBAs were primarily motivated by improving their farming practice and those of their neighbors.** Many VBAs, implementers, and extension officials highlighted that VBAs were motivated and proud to be able to serve and support their communities and other farmers. Our survey data likewise show that the top two motivations reported by VBAs were the ability to improve their farming practices and help other farmers in their community (Table 6).

> *When you train the farmers, they will get the harvest, now you are eradicating hunger in your community. Yeah, and you won't struggle. They'll have maize, they will have enough food and the community will prosper well. But if you don't train them, they'll just go back and start planting the old ones, the harvest will decrease, then we start struggling.* (Woman VBA, Kenya)

Some VBAs reported social benefits from their roles. For example, VBAs in Burkina Faso, Kenya, and Nigeria noted that being a VBA increased their social standing and found the experience of becoming VBAs empowering, especially in terms of growing their leadership capabilities. One VBA in Kenya was elected assistant chief after becoming a VBA, suggesting increased community confidence in his leadership abilities.

**Table 6. Top motivations for continuing the VBA program, by country**

| | Burkina Faso | Nigeria | Kenya | Tanzania | Mozambique |
|---|---|---|---|---|---|
| Improved farming practices | **52%** | **71%** | **52%** | 48% | **60%** |
| I want to help farmers in my community | 27% | 70% | 50% | 33% | 35% |
| Higher income | 48% | 70% | 18% | **54%** | 29% |
| Training | 10% | 53% | 36% | 18% | 10% |
| Supports my business | 7% | 53% | 9% | 32% | 9% |
| Respect from community | 26% | 55% | 6% | 18% | 4% |
| Growing my market network | 2% | 41% | 6% | 11% | 6% |
| I am not motivated to continue | 1% | 3% | 6% | 8% | 1% |

Source: VBA phone survey, December 2022.

Note: Top motivation for each country is shaded in dark grey and the second and third most commonly cited motivations are shaded in light grey.

N = 1,032.

**VBAs, particularly those involved in agribusinesses, were also motivated by the additional income they earned.** In Tanzania and Burkina Faso, where the median reported incomes earned were higher than other program countries (Figure 4), nearly half the survey respondents cited higher income as one of their primary motivations (Figure 6). VBAs with agribusinesses in Kenya explained that they were motivated to continue engaging and providing trainings to farmers because this further increased their profits in a virtuous cycle. Trainings and demonstrations on the use of inputs generate demand for the inputs that VBAs sell. When farmers experience increased productivity from the improved inputs, they believe that the inputs are high-quality and reliable, and continue to purchase supplies from VBAs. As one VBA notes:

> *We were introduced to the companies [by AGRA]. I called the companies who bring me fertilizer … and farmers have observed that our fertilizer is the best. So, if I go and buy fertilizer and bring to sell to the farmers, I sell a lot because I have a shop and others in this group also have shops.* (Woman VBA, Kenya)

VBAs also have an incentive to continue to reach more farmers and to connect with them season after season to understand their preferences for different seed varieties and other products, and then provide those inputs.

### Challenges

**VBAs highlighted numerous challenges in providing extension to farmers, including unreliable availability of inputs, large time burdens, and transportation costs.** Many VBAs cited frequent input delays or unavailability, limiting their ability to earn income from input sales and also sometimes resulting in farmers reverting back to the use of local seeds or previous agricultural practices. A few farmers also reported purchasing seeds for vulnerable farmers who were unable to access public seed distributions on their own as an additional cost. In Burkina Faso and Kenya, input challenges can affect VBA-farmer relationships, as one VBA noted:

> *Now for input issues, if a producer (farmer) needs the inputs, you promise him and if he does not receive the inputs, it creates a lack of trust between the producers and me. The assurance of the availability of inputs gives me credibility in the eyes of producers (farmers) and facilitates our work rapport.* (VBA youth, Burkina Faso)

In Nigeria, VBAs and implementers also reported challenges with adulterated seeds. Farmers complained to VBAs that the seeds they purchased from recommended agri-dealers marketed as "genetically improved" yielded no or little harvests. As a result, VBAs from one area brought the issue to the local government, who subsequently established a task force to monitor seed quality at local agri-dealer shops.

**Most VBAs reported experiencing large time burdens and high transportation costs associated with providing farmer training and advice.** These VBAs explained that the time they spent on training or providing extension services to farmers meant time away from working on their own farms or agribusinesses. In Burkina Faso, Tanzania, and Nigeria, some VBAs explained that those who have the money to hire help on their farms or with their agribusinesses are better able to meet their VBA responsibilities, albeit at an additional cost. VBAs from our phone survey likewise reported insufficient transportation as a top challenge (Figure 6). Transportation and fuel were the primary costs that VBAs had to pay out of pocket, particularly for those who reach many farmers spread across long distances. For example, in Nigeria, VBAs

reported that it was especially costly when responsible for up to 300 farmers (sometimes across different villages), both in terms of time and transportation. Some VBAs also reported having to pay to transport inputs from suppliers and to transport aggregated produce to off-takers. A few VBAs also reported having to pay transportation reimbursements so farmers could attend their trainings. Several recommended adding small stipends or reimbursements to the program to offset these costs.

**Figure 6. Top challenges for VBAs, by country**

| | Burkina Faso | Nigeria | Kenya | Tanzania | Mozambique |
|---|---|---|---|---|---|
| 1 | 45% | 53% | 48% | 39% | 40% |
| 2 | 42% | 47% | 25% | 39% | 23% |


Source: VBA phone survey, December 2022.

N = 1,032.

**Many VBAs reported that limited access to finance and credit was a major obstacle to engaging in agribusiness.** A key assumption in the program ToC is that VBAs and farmers have sufficient access to finance to allows for productive investments in farm or businesses. However, many VBAs emphasized that a lack of capital was the main barrier to starting agribusinesses or becoming agri-dealers. In Nigeria, for example, some VBAs needed to show input providers that they had enough capital to purchase initial inputs before they could serve as agri-dealers. VBAs already involved in input dealing or aggregating explained that they primarily needed capital to purchase higher volumes of inputs and outputs, either to produce at the volume necessary for off-takers or to accommodate farmers' demand:

> *In uplifting the farmers, one wants 250 chickens and another 300, we don't have enough to supply. We are looking for a way to get money to meet their demand quickly. We have created a huge demand we cannot meet.* (Woman VBA, Kenya)

Many VBAs reported that they were unable to access loans through financial institutions because they did not have a guarantor or sufficient collateral. Besides accessing credit through formal financial services, some VBAs found it difficult to receive inputs on credit from input providers. Implementers, input providers, and off-takers reported that VBAs often did not meet credit requirements and/or input providers had experiences with VBAs defaulting. In other cases, farmers and VBAs needed loans to expand production. Although implementers encouraged VBAs to apply for loans as farmer groups, qualification was largely dependent on the crop and volumes produced by the farmer group. Off-takers reported that farmers often defaulted when other buyers offered a higher purchase price or because environmental shocks affected farmer harvests.

In Kenya, VBAs appeared to have more linkages with financial institutions and services, such as the Kenya National Chamber of Commerce and *chamas* (or savings groups). However, VBAs in Kenya still named lack of access to finance as a main challenge and also found it difficult to

qualify for loans with higher ceilings or credit without a strong guarantor or transaction/credit history. For example, one VBA explained that if financial institutions would allow smallholder farmers to provide mobile money transaction history in lieu of bank account statements, more farmers would be able to access credit.

**Among VBAs who had a businesses, some also employed people.** Of the 40 percent of VBAs who had a business, nearly half reported having at least one employee (including part-time and seasonal work), a large share of which were young (Figure 7). The average number of employees per VBA business owner was 1.5, ranging from 0.7 in Kenya to 3.3 in Nigeria (Figure 8 and Appendix E).

**Figure 7. Employment generated by VBAs who had a business**

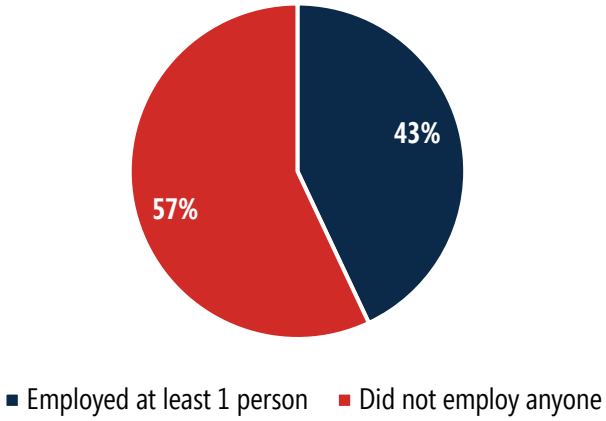
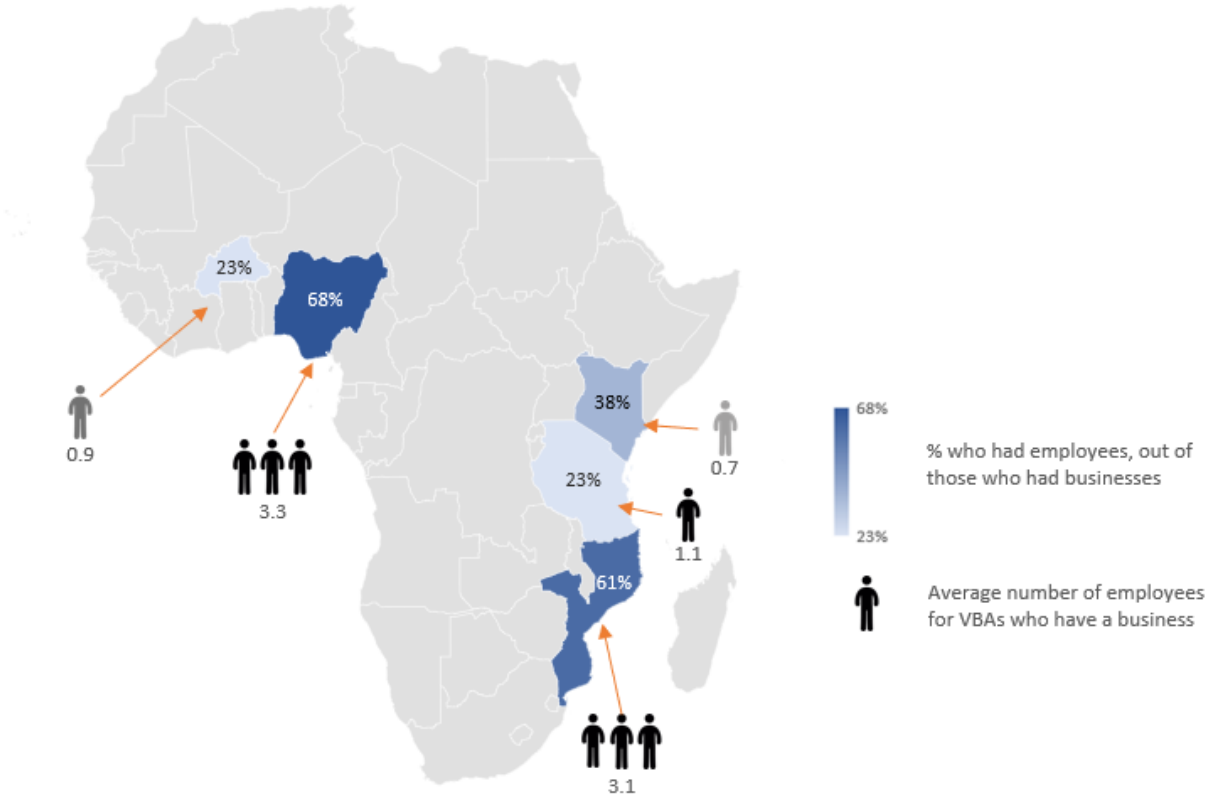


**Figure 8. Employment generated by VBAs, by country**




Source: VBA phone survey, December 2022.

N = 1,032.

**Women VBAs who owned businesses were more likely to hire women, and young VBAs were who owned businesses were more likely hire youth.** While all VBAs were most likely to hire youth, the type of ownership influenced the type of people VBAs were likely to hire. Women VBAs hired 16 percentage points more women than men VBAs, and youth VBAs hired 12 percentage points more youth than non-youth VBAs (Table 7).

**Table 7. Type of employment generated by VBAs who had businesses, by gender and age group of VBA**

| | Sample | Percentage of women employees | Statistically significant difference | Percentage of youth employees | Statistically significant difference |
|---|---|---|---|---|---|
| **ALL VBA** | **176** | **37%** | **N/A** | **81%** | **N/A** |
| **By youth status of business owner** | | | | | |
| Youth VBAs | 53 | 36% | NO | 90% | YES* |
| Non-youth VBAs | 123 | 38% | | 78% | |
| **By gender of business owner** | | | | | |
| Women VBAs | 66 | 47% | YES* | 75% | NO |
| Men VBAs | 110 | 33% | | 81% | |

Source: VBA phone survey, December 2022.

* indicates statistical significance level of p<0.05,

** indicates statistical significance level of p<0.01,

*** indicates statistical significance level of p<0.001.

N = 176.

### Gender and youth

**Most recruitment and retention challenges for women are related to long-standing social and cultural norms, resulting in fewer women than men VBAs.**[2] For example, in areas of Tanzania, Nigeria, and Burkina Faso, many married women must receive permission from their husbands before they are able to participate in the program. Their husbands may be hesitant to give that permission since VBAs are required to work and train with men in the community who the women are not related to.

> *Producers are not ready for their wife to work with another man. And it was a blockage for the selection of women.* (Implementer, Burkina Faso 1)

> *Following the specifications, the 2 VBAs must carry out the activities together, i.e. do the trainings together, work on the demonstration plots together, travel together to attend 2 or 3 day trainings with the project managers. In some localities it is very frowned upon to take another person's wife on a motorcycle to go to training outside the village. [We] had not taken this aspect into account and was a real obstacle to recruiting VBA women.* (Implementer, Burkina Faso 2)

In addition, recruitment criteria in some countries served as an obstacle to recruitment. For example, the ability to speak, read, and write in local languages as well as the country's official language was a difficult requirement for many women to meet in Nigeria and Burkina Faso, given rural women's lack of access to formal education.

**Implementers made efforts to overcome some of the barriers to recruiting women**. To address social and cultural barriers, implementers in Nigeria provided sensitization trainings,

[2] With the exception of Kenya, where women make up a majority of VBAs, women represent about one-third of VBAs or less in the evaluation countries (Table 2).

encouraging men to allow women to participate in farming activities by emphasizing that women's participation could contribute additional income to their family, and by offering inputs at a lower cost to women to incentivize their participation in farming and agribusiness endeavors. Implementers in Nigeria also reported that they had better success recruiting women to the program when women extension agents participated in the recruiting. In Burkina Faso, implementers began choosing a man VBA's wife or a woman VBA's older sister as the paired VBA to ensure gender quotas were closer to being met, while also addressing the cultural hesitancies around who women were partnered with men within the VBA role. Other implementers adapted their selection criteria to be more inclusive of women (for example, lowering education requirements). However, implementers continued to struggle to recruit women VBAs even with these modifications.

**Women reported additional challenges related to household responsibilities, mobility challenges, and cultural beliefs around women in leadership positions.** In general, women face many demands on their time outside of their roles as VBAs. Several described the VBA experience as having multiple full-time jobs. For example, women reported that they are expected to hold all child care responsibilities and do all household on top of their VBA duties.

> *As a woman, when I go to train, I come … [and] I have to go to the kitchen…. I have to go fetch for water, or look for firewood. Now that becomes one of the challenges for us women VBA, because you find, when a man VBA goes out there, he just gets home and calms down or he gets to sleep, but when I get [home] I go straight to the kitchen.* (Women VBA, Tanzania)

Implementers and VBAs across all countries emphasized that training and extension work can be particularly difficult for women with young children at home, especially those still of breastfeeding age. For example, the traveling for training (which can often require multiple days away from home) and engaging with farmers in remote areas are not possible for many women who need to adapt the role to focus their work closer to their homes. Mobility is also an issue for women VBAs as they often have even less access than men to resources like bicycles to safely facilitate the travel their role requires. In some areas, women are discouraged from traveling alone or with a man who is not their husband. Several implementers and VBAs in Tanzania, Burkina Faso, Nigeria, and Mozambique also reported that men showed some resistance to women holding trainings or being in leadership positions.

**Despite the challenges, most implementers reported that women VBAs perform just as well if not better than men VBAs in their extension activities,** partly because they are able to access a large web of social groups and because women farmers prefer working with them rather than men. Stakeholders also reported that women VBAs were more willing than men to work in the community without pay, and women were more solely focused on agriculture than men, who more often leave the program to search for other employment opportunities. Several farmers said women VBAs are trusted as agricultural experts in their communities and that the good agricultural practices they teach spread quicker in areas with a high percentage of women farmers.

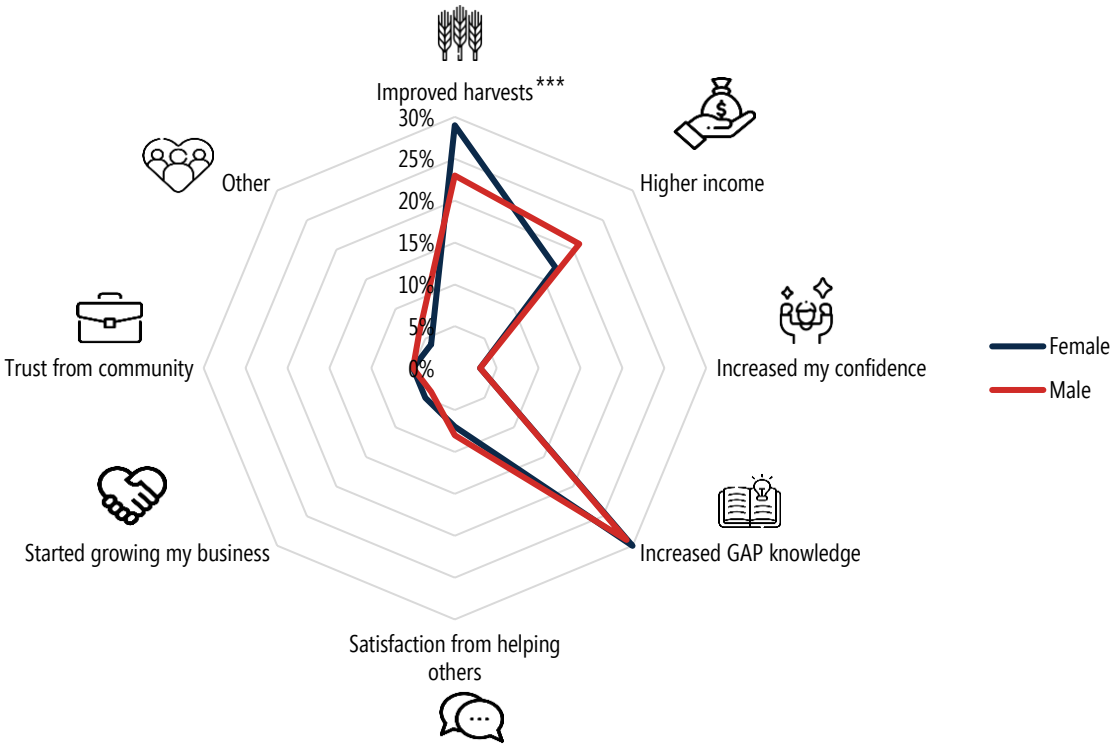
> *Yes, there are groups that don't let the men talk to them but if I go there as a woman they welcome and listen to me. There are very big cooperatives in our village that don't trust people easily but because am a woman and most of them are women too, they listen to me. I even connected them with a company to be buying seed.* (VBA, Nigeria)

Similarly, some input suppliers and farmers trusted women more than men when it comes to handling money. For example, in Mozambique, a group of farmers reported that, when giving VBAs money to purchase inputs, women tend to be more transparent and accountable.

**Interviewees reported that women farmers are likelier to attend trainings held by women VBAs rather than men VBAs.** The importance of having women VBAs lead trainings was emphasized in all countries. In Burkina Faso and Nigeria, husbands in some communities were more comfortable sending their wives for trainings when VBAs were women, which was particularly notable in areas in Nigeria where it was generally difficult to get women to participate in trainings.

**Women and men vary in how they assess the main benefits of the VBA program.** Generally, both men and women VBAs reported that improved knowledge of GAPs was the most important benefit of being a VBA. However, women were more likely than men to report improved harvests as the main benefit and men were more likely to cite increased income as a main benefit (Figure 9), which indicates that women may not have as much agribusiness opportunity as men who are VBAs.

**Figure 9. Differences between men and women VBAs in reporting the most important impacts of being a VBA**



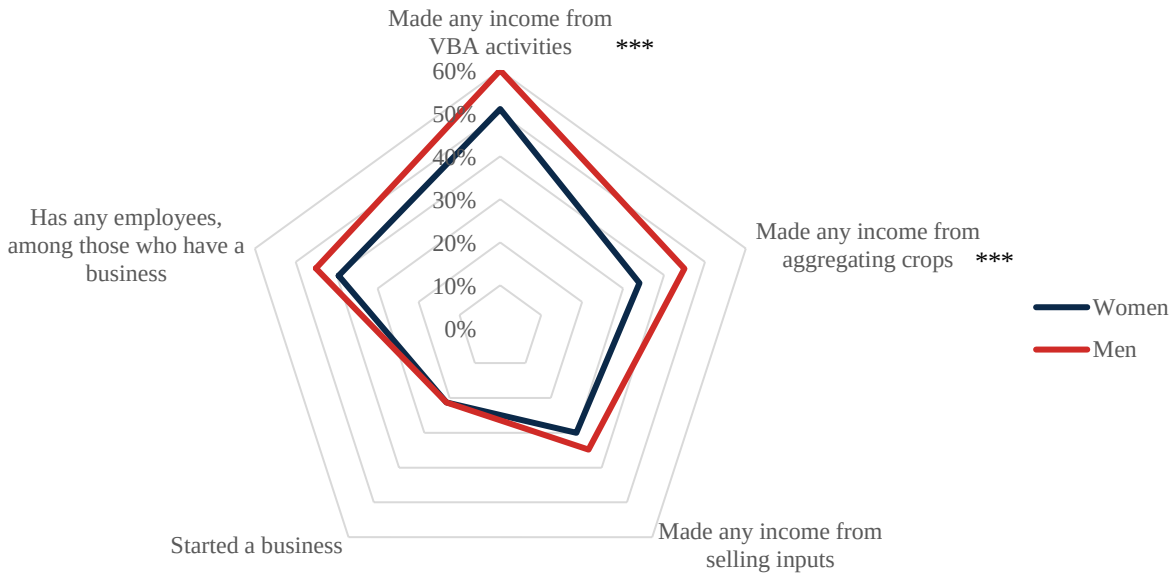

Source: VBA phone survey, December 2022.

N = 1,032.

**Some of the challenges that women face as VBAs may affect their outcomes**. While there was no significant difference in the share of women and men starting businesses as VBAs, women were less likely to earn income from their VBA activities, especially from aggregating crops, which is a more labor-intensive activity that can require significant travel (Figure 10).

When they did earn money, the women VBAs we surveyed reported earning on average 40 percent less than men ($344 U.S. dollars median annually compared to $574 for men), a difference which persisted across all countries (see Appendix F).

**Figure 10. Differences between men and women VBAs in income and business outcomes**




Source: VBA phone survey, December 2022.

* indicates statistical significance level of p<0.05,

** indicates statistical significance level of p<0.01,

*** indicates statistical significance level of p<0.001.

N = 1,032.

*Young VBAs*

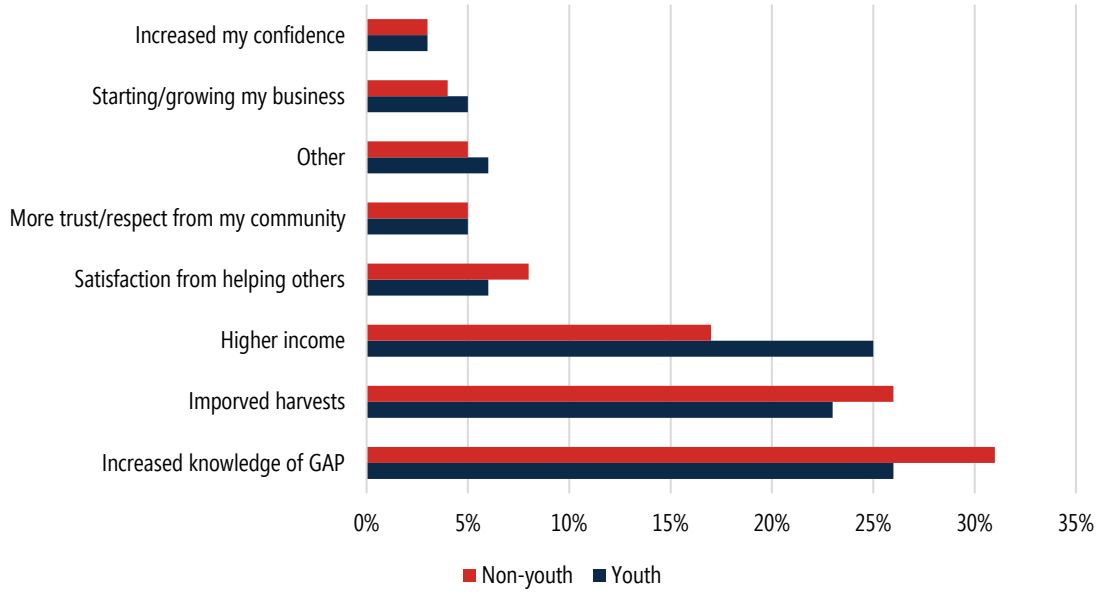
**Recruitment, and especially retainment, of youth VBAs was a challenge due to the lure of more lucrative positions and lack of access to land.** Young people tend to be more mobile, and stakeholders reported that they often leave rural areas to further their education or search for employment opportunities with steadier income streams than being a VBA can offer. Youth and gender might also intersect in terms of mobility because young, unmarried women are much more likely to leave their communities once they become married, posing an issue for recruitment.

Land ownership is also an issue in program countries since many young people do not own land to farm and use for demo plots.

> *There are some challenges with youth. Even to bring them onboard in agriculture is a challenge. But VBA is a good entry point for youth. Most of youth don't own land, so they cannot have demo plots. Farmers need to believe when they see practices. They are in school to be employed—VBAs do not provide employment. Some things are being done, but they are not sustainable. IF they can have access loans, and if they can be a part of the value chain, where they can fit. Then maybe they will agree to fit there.* (Extension Official, Kenya)

**The phone survey data also indicate that younger VBAs value income generation as the main benefit of being a VBA.** Figure 11 compares younger and older VBAs in terms of their perceptions of most important benefit of being a VBA. Twenty-seven percent of youth VBAs chose higher income as the main impact of the program compared to only 18 percent of VBAs above the age of 35. Even though higher income was prized among youth, there were stark differences between young men and young women. Young men were twice as likely as young women to cite higher income as the most important impact of being a VBA (Appendix H). Conversely, young women twice as likely to cite increased harvests as the most important benefit. This difference probably reflects a greater focus on the family and farm among young women and greater focus on income generation among young men.

**Figure 11. Differences between younger and older VBAs in reporting the most important impacts of being a VBA**




Source: VBA phone survey, December 2022.

* indicates statistical significance level of p<0.05,

** indicates statistical significance level of p<0.01,

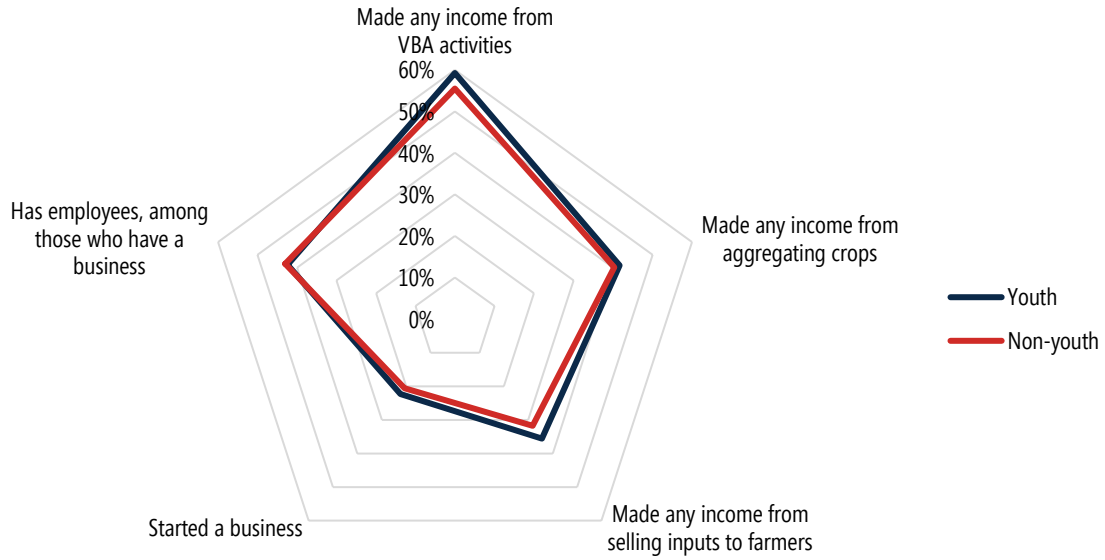
*** indicates statistical significance level of p<0.001.

N =1,032.

**Despite recruitment and retainment challenges, implementers report that active youth VBAs perform very well in their roles.** Compared to older VBAs, some implementers found youth VBAs were more adept at using technology and grasping new agricultural knowledge to disseminate to their farmers, since they tend to embrace innovation more quickly. In Nigeria, respondents noted that young VBAs also tend to have had high levels of education, which could aid in digital literacy and in learning new information to teach to others. Agri-dealers interviewed particularly appreciated the communicative skills of younger VBAs and reported that they are often more focused on the business side of their role. Similar to how women VBAs are likely more effective in relating to and training women farmers, implementers and younger VBAs report that they are better able to connect with, motivate, and train other young people involved in farming. Several unmarried young VBAs also noted that compared to VBAs with families, they have fewer competing responsibilities and find the VBA role easier to balance with their personal life.

**Despite the advantages that younger VBAs offer, survey data does not show significant differences in business-related outcomes for younger and older VBAs.** In the analysis of our survey data, we found that younger VBAs did not earn more income than older VBAs, nor were they more likely to start a business and employee workers in their business (Figure 12).

**Figure 12. Differences between younger and older VBAs in income and business outcomes**




Source: VBA phone survey, December 2022.

* indicates statistical significance level of p<0.05,

** indicates statistical significance level of p<0.01,

*** indicates statistical significance level of p<0.001.

N = 1,032.

To improve the attractiveness of the VBA model to youth, several stakeholders suggested tailoring the program to the concerns that younger people have. Some implementers and experts suggested providing monetary incentives or specialized access to credit for youth to start businesses (such as postharvest services) in order to get them to join and remain in the program.

## Systems change

As the theory of change indicates, the VBA program is both embedded in public extension and private market systems and also has the potential to exert influence on those systems. Our evaluation finds that the primary impact pathways are increasing yields and profits for farmers and income for VBAs themselves. However, the existence of a large VBA program ultimately affects the reach of the public extension program and private sector markets. VBAs have the potential to improve the overall market ecosystem by increasing the market reach of current actors and even drawing in new market actors. In this section we examine the interaction of VBAs with public and private systems, how VBAs work with those systems, how those systems affect VBAs' chances of success, and how the VBA program impacts those systems.

### The VBA Program within Country Systems

Each country has a similar set of system actors that operates in a specific policy context, and the strength of relationship of those actors with VBAs and farmers varies across those contexts. Below we briefly describe the main contextual features that affect the VBA program. Figures 13–17 show system actor maps for each country and illustrate the relative influence of the actors and the strengths of the linkages between them. Across all countries implementers played a key role in building the relationships between VBAs and market actors, especially input suppliers. These relationships appeared to endure after the implementers' contracts have ended. However, in most countries we found relatively weak links between VBAs/farmers and off-takers, with the notable exception of Mozambique (Figure 14). In some countries, like Kenya and Nigeria, VBAs were more likely to connect directly with the seed companies, whereas in Tanzania they work more directly with town-based agri-dealers. In all countries the connection between VBAs/farmers and financial institutions or insurance providers is weak to nonexistent. Implementers and VBAs also worked with local level governments, who are supported by national government bodies to various degrees. For example, in Kenya authority is devolved to the country level, so the relationship between VBAs and country-level government authorities is the most important. Finally, all countries exhibited strong linkages between VBAs and extension authorities, which helped support the connection between VBAs and farmers. Below we present individual country actor maps and country context descriptions.

*Kenya*

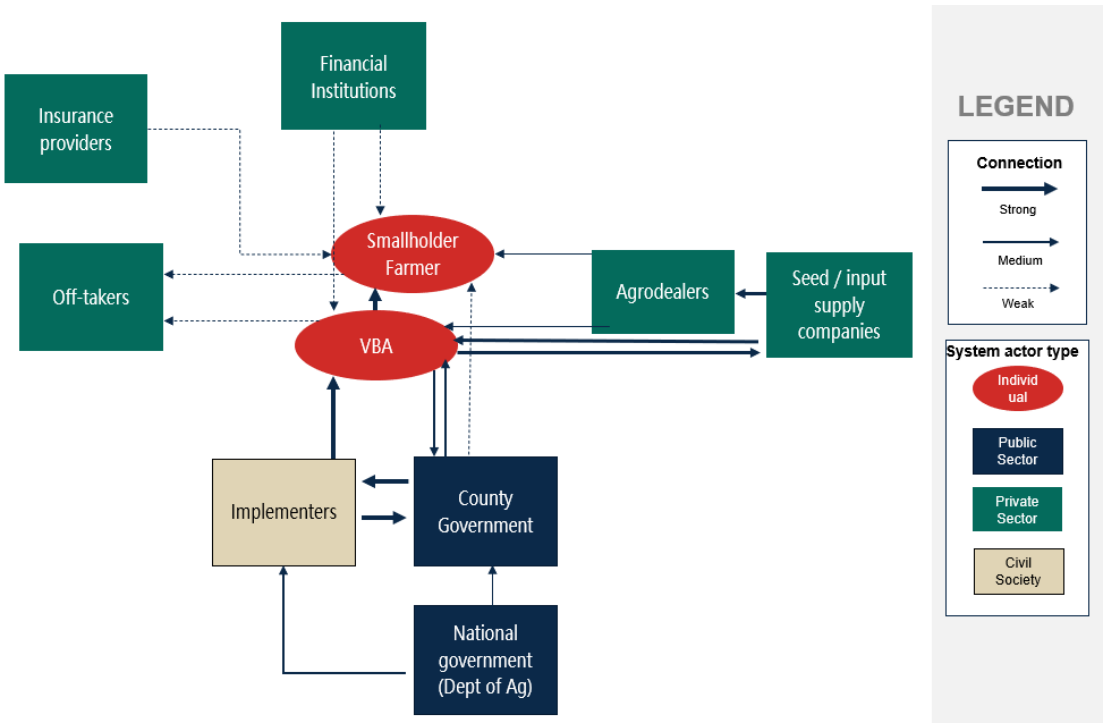
In Kenya, the average farm size is .86 hectares[3] and fertilizer use is quite high at 65.2 kg per hectare of arable land.[4] The extension program has one extension officer per 1,193 farmers[5]. The agrodealers network is quite robust with 5,611 agrodealers and a ratio of 1 agri-dealer per 1,915 agricultural households.

[3] All farm size data from FAOStat.
[4] The African Union-Abuja declaration rate is 50 kg/ha. All fertilizer estimates are from World Bank data compiled from Food and Agriculture Organization, electronic files and web site
[5] All extension officer and agrodealers ratios are from the African Seed Access Initiative (TASAI) country reports.

In Kenya VBA program areas, we found relatively weak links between VBAs/farmers and off-takers. VBAs in Kenya tended work more directly with seed and input supply companies and less with agrodealers in obtaining inputs. There was slightly more availability of finance and credit than in other countries; however, in practice VBAs found it difficult to access credit given high interest rates and the pre-requisites for establishing creditworthiness. There is a relatively high penetration of agrodealers in some of the VBA areas in Kenya which can limit VBAs' ability to operate as agrodealers.

In Kenya, governmental authority is devolved to the county level, so the relationship between VBAs and county-level governments is the most important. County-level officials noted that devolution of power from the central government to the counties has made the extension program even more resource constrained, increasing their interest in working with VBAs.

**Figure 13. Kenya Actor Map**



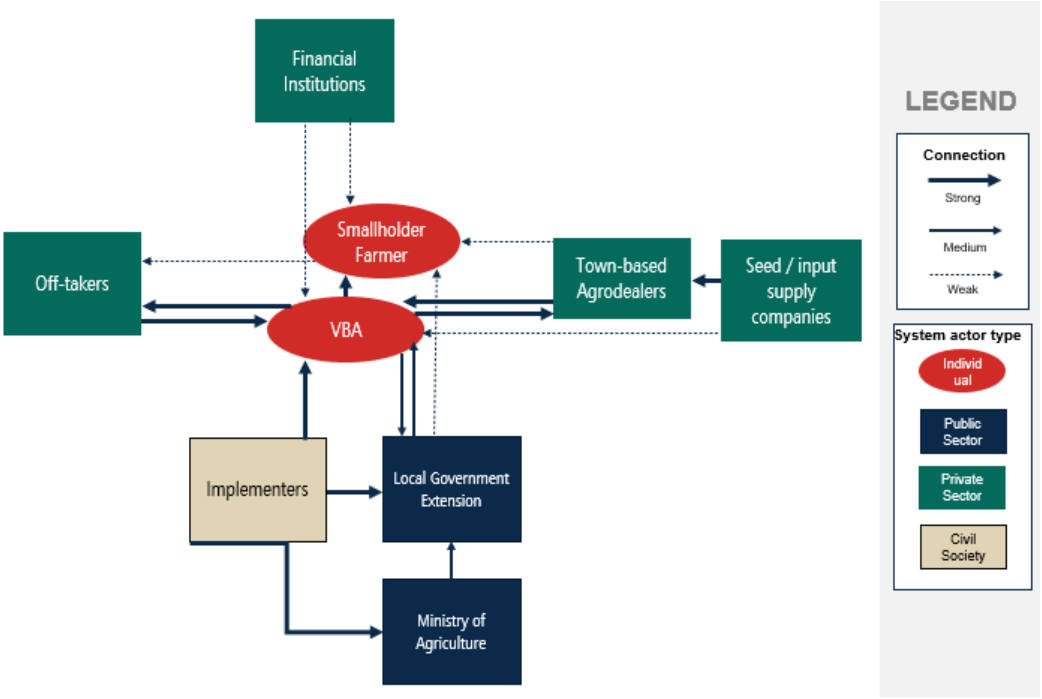

*Mozambique*

Mozambique is less densely populated than the other countries of our study and has a rural population of just over 20 million, the majority of whom are employed in agriculture. The average farm size is 1.2 hectares[6] and fertilizer use is relatively low at 11.2 kg per hectare of arable land. The extension program has one extension officer per 693 farmers, but farms are quite dispersed making reaching farmers more challenging. The agri-dealer network is very limited with only 145 agrodealers and a ratio of one per 29,655 agricultural household.

[6] CGAP (2016). National Survey and Segmentation of Smallholder Households in Mozambique

Unlike in other countries, in VBA program areas there were strong links between VBAs and off-taking markets. These links were facilitated by high integration between input suppliers and off-takers and pre-existing warehouse infrastructure in the areas where VBAs worked. In terms of inputs suppliers, VBAs worked most often with town based agrodealers and less with seed companies directly, given the greater proximity to agrodealers than seed companies. The VBA areas in Mozambique are sparsely populated and underserved by market actors in general, so there is room in the market for VBAs to fill an open niche. As in all countries, farmers and VBAs in Mozambique had poor access to credit and financial institutions.

**Figure 14. Mozambique actor map**




*Tanzania*

Tanzania's large rural population is predominantly employed in agriculture, and the average farm size is somewhat larger than other countries in our review at 1.89 ha. However, fertilizer use is relatively low at 15.9 kg per hectare of arable land.[7] The extension program has one extension officer per 820 farmers, but farms are quite dispersed making reaching farmers more challenging. The agri-dealer network is large with only 7,189 agrodealers and a ratio of one per 1,085 agricultural household.

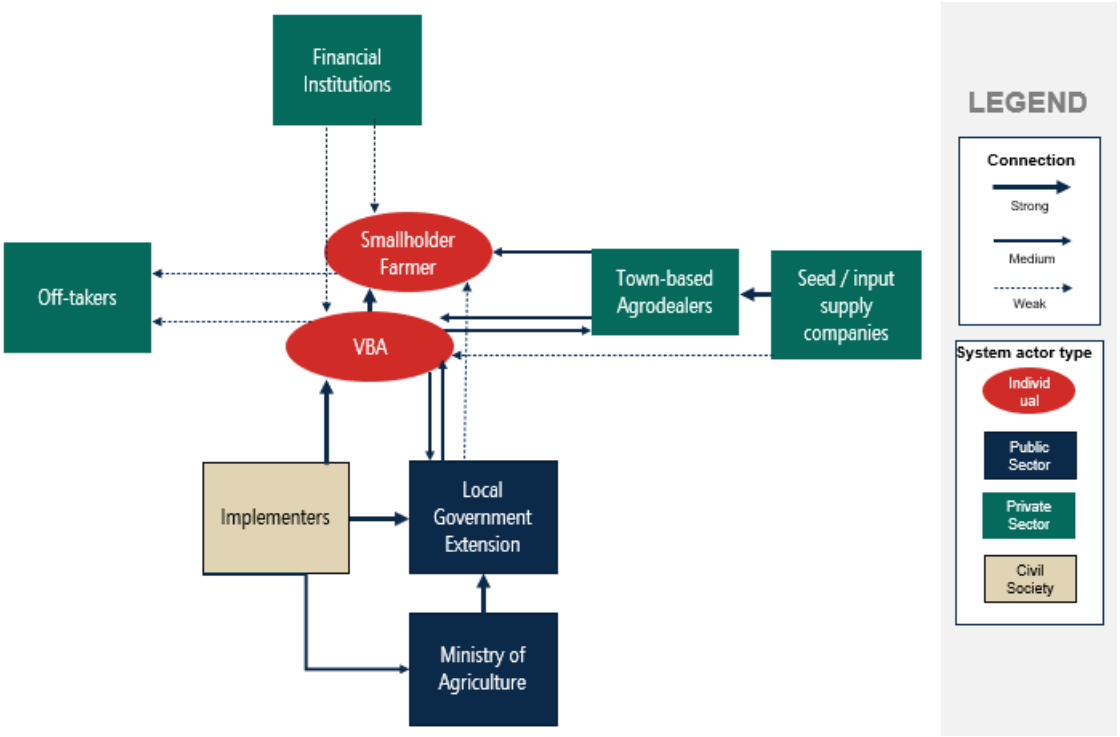
As in other countries, VBAs in Tanzania had relatively weak links with off-takers. This was due in part to selling price unpredictability, a lack of large grain purchasers and farmers preference for selling to briefcase buyers in VBA program areas. As in Mozambique, VBAs were less likely to work directly with input suppliers and more likely to work directly with town-based

[7] World Bank 2020

agrodealers due to their greater proximity. The connection between VBAs/farmers and financial institutions or insurance providers in Tanzania is weak to nonexistent.

In the past year, the Ministry of Agriculture put in place a fertilizer subsidy program with frequent changes in implementation, causing confusion in private sector markets. For example, the subsidy program recently prohibited the sale of unsubsidized fertilizer and allowed only town-based agrodealers to sell it, locking VBAs out from that revenue source. At the same time, the government recently ratcheted up interest in and resources for the extension program. For example, the government increased the agricultural sector budget by over 200 percent with the goal of improving extension services, agricultural research and irrigation infrastructure.

**Figure 15. Tanzania actor map**




*Nigeria*

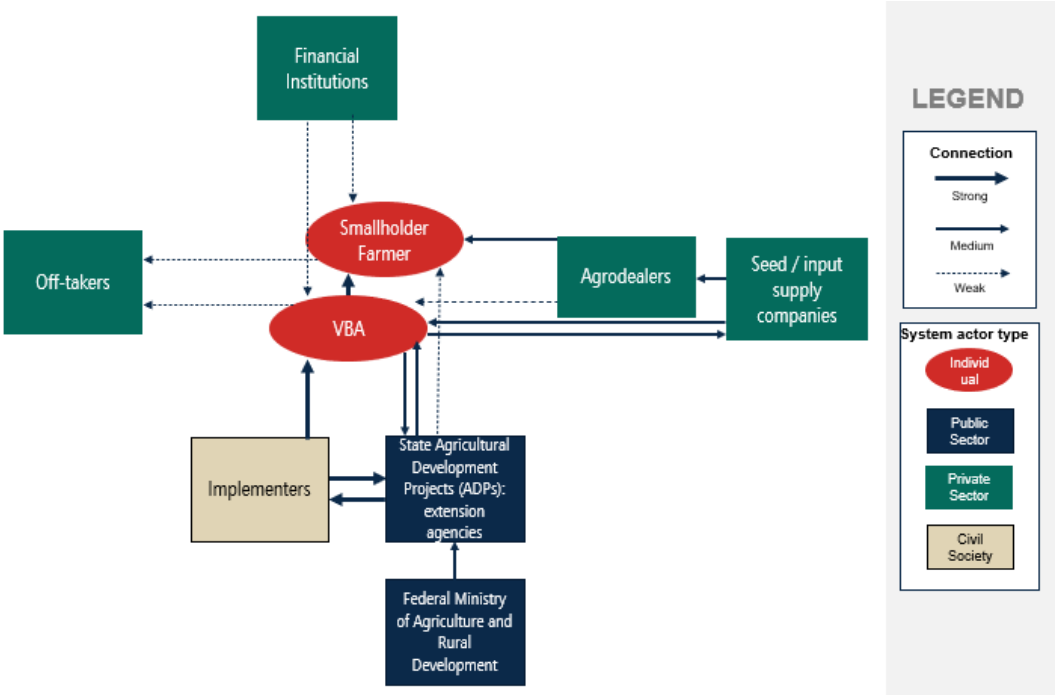
Nigeria has a very large rural population, most of whom are employed in agriculture, and the average farm size is only 0.86 ha. Fertilizer use is relatively low at 19.6 kg per hectare of arable land. The extension program is inadequate to serve the large population with only one extension officer per 7,500 farmers, and farms are quite dispersed making reaching farmers more challenging. There are only 30 registered agrodealers in Nigeria but a larger network of unregistered agrodealers. Recently farmers are facing higher fertilizer costs because the federal government fertilizer subsidy ended in 2021.

As in most other countries, there were relatively weak links between VBAs, farmers, and off-takers. However, in VBA program areas in Nigeria, seed companies sometimes also operated as

grain buyers which integrated the value chain and helped some farmers access output markets. VBAs were also more likely to work directly with seed companies and input suppliers than agrodealers. Program implementers facilitated these relationships to ensure the transparency and traceability of seed sources, and also to increase VBA profits through the selling of high-quality seeds. VBAs working directly with seed firms and input suppliers rather than agrodealers removes middlemen in the supply chain and helps VBA's gain experience as agribusiness experts. As in other countries of our study, the connection between VBAs/farmers and financial institutions or insurance providers is weak to nonexistent.

The Nigerian agricultural extension system is decentralized and each state independently runs an Agricultural Development Programme (ADP). Currently VBAs are only operating in two states (Niger and Kaduna) and collaborate with each state's ADP. In order to scale, the VBA program would need to partner with each individual ADP.

**Figure 16. Nigeria actor map**




*Burkina Faso*

Burkina Faso has a relatively smaller rural population than the other countries of study, the vast majority of whom are employed in agriculture and who have generally low crop productivity due to low rains and nutrient poor soils. Fertilizer use is relatively low at 17.3 kg per hectare of arable land. The extension program is large, with one extension officer per 424 farmers. Burkina Faso has 1,460 agrodealers with a ratio of one per 1,173 farmers. Burkina Faso also has a relatively well- established farmer cooperative system.

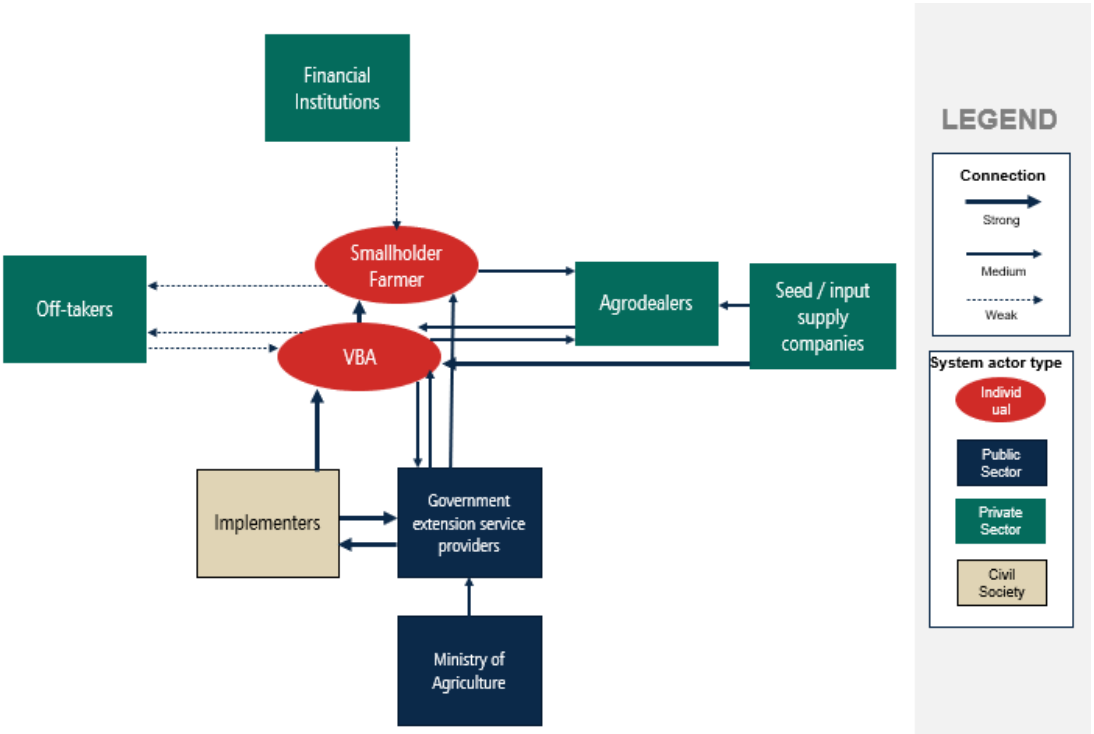
As in other countries, the links between farmers and off-takers in Burkina Faso was rather weak, as reported by interviewees. VBAs interacted mainly with agri-distributors who are easily

accessible and represent seed and input supply companies in many localities. Seed companies and input suppliers also have outlets in certain areas not far from their companies, which made collaboration between VBAs and the companies easier. The connection between VBAs/farmers and financial institutions or insurance providers is weak to nonexistent because financial institutions do not provide credit to farmers due to a lack of guarantee and insurance products are not available.

Implementers and VBAs work with the extension service providers, who are supported by the Ministry of Agriculture. The government subsidizes fertilizer and while the subsidized price is slightly lower than the market price, the government cannot satisfy the demand for fertilizer at this price. To help farmers access inputs, the government sends fertilizer to provincial and departmental agriculture departments for resale to producers, but it often arrives too late. In addition, the subsidy program prohibits VBAs from selling chemical fertilizers. Instead, VBAs tend to act as intermediaries, and collect information about farmers' needs to transmit to agri-distributors who supply the inputs.

Authority for agricultural extension in Burkina Faso is devolved to the provinces. Local extension workers are supervised by the technical support zone leader of the Ministry of Agriculture. The government would like to expand the VBA program throughout the country so that more farmers have access to agents who can advise them on good practices.

**Figure 17. Burkina Faso actor map**



### Private sector systems-level changes

*Connection with input markets*

**Respondents from all countries reported that VBAs expanded input suppliers' market share and reach**. VBAs appeared to be successful in both connecting farmers to input suppliers and generating an increase in farmer demand (through trainings, demonstration plots, and tester packs), which input suppliers in turn satisfied. In locations with low population density, like Tanzania and Mozambique, VBAs were also able to improve the accessibility of inputs to farmers, sometimes by setting up input supply shops in areas where the closest shop was a long distance. In some cases, the presence of VBAs appeared to encourage additional suppliers to open outlets there. Specifically, in Kenya some interviewees reported that VBAs had been able to generate enough demand among farmers for improved seeds to motivate seed companies to expand their supply to VBA areas. In all countries, interviewees reported that input suppliers increased their sales due to the VBA program. An implementer in Burkina Faso noted:

> *There are suppliers who could not sell 100 tons of fertilizer but today they sell 500 to 600 tons of fertilizer. For example, a supplier said that before the project, that his turnover did not exceed 30,000,000 FCFA but that today he is at 150,000,000 FCFA of turnover.* (Nongovernmental organization officer, Burkina Faso)

**Despite this increase in input supply and access, high prices, lack of access to credit, and poor infrastructure limit market transactions.** In our survey of VBAs, high input prices were the number one challenge cited by those who engaged in input selling (see Appendix C). High prices not only limit farmers' ability to purchase a sufficient number of inputs, but they also reduce VBAs' opportunity to earn a commission. A lack of credit also prevents farmers from purchasing at the amounts they need and VBAs from purchasing enough product from input suppliers who demand upfront payment. Finally, interviewees cited long distances and poor physical infrastructure as significant barriers to market access that VBAs were not able to fully overcome.

**Government input subsidies at times complicated the private market system.** In Burkina Faso, input suppliers reported feeling undercut by the government fertilizer subsidy program, which meant that farmers could purchase subsidized fertilizer more cheaply than VBA-supplied fertilizer. (However, the late delivery of subsidized fertilizer helped ensure that there was still some demand for unsubsidized fertilizer.) There was a similar challenge in Tanzania, where the government can discount fertilizer by as much as 50 percent and prohibit the sale of unsubsidized fertilizer. VBAs reported that since the government only authorized certain generally town-based distributors to sell subsidized fertilizer, VBAs would be largely excluded from fertilizer sales.

*Connection with output markets*

**Output market strengthening has not been a key aspect of the program in most countries, but some countries had more success.** In Kenya, farmers in VBA areas generally do not grow enough surplus produce to incentivize VBAs to aggregate, and farmers are also reluctant to form groups. In Tanzania, farmers also preferred to sell individually rather than in groups, and there appeared to be relatively few buyers—thereby putting farmers in a poor negotiating position. However, there were cases in which facilitating off-taking worked more smoothly. According to

survey responses in Burkina Faso, Nigeria, and Mozambique, VBAs had relatively more success in earning income through aggregating produce. In Mozambique, VBAs were more successful in their market activity because of a dearth of market actors in rural areas, coupled with the availability of storage warehouses. In Burkina Faso, the farmer cooperative system is relatively well established, which may have made it easier for VBAs to organize farmers into groups or work with pre-existing groups to aggregate crops. In Nigeria, seed suppliers and grain buyers were often the same company, so VBAs benefited from the linkages established at the input side to also support off-taking.

**Interviewees articulated multiple challenges in working with output markets.** The most frequently cited challenge in the survey of VBAs was the fluctuations in prices for those who engage in off-taking activities (see Appendix D). VBAs reported that that it was difficult to ensure that the selling prices farmers agreed to accept early in the season would be sufficient for farmers to maintain their commitment. At harvest time, if farmers could receive a higher price from another buyer, they had a hard time honoring their agreements. In other cases, farmers might do such "side selling" simply because they have an urgent issue that demands cash. As one VBA in Tanzania noted:

> *By the time you want them to do bulk selling, you find that most of them had some challenges and had already sold their produce…. And because the farmer is constrained he sells to the trader and this seem to be easy to the farmers as the trader goes to his/her house, the farmer does not have to transport the produce, this is a relief to a farmer.* (Woman VBA, Tanzania)

VBAs additionally reported that buyers had challenges with farmers not producing either enough volume or enough high-quality produce for them to engage in aggregation activities.

*Success factors*

**Market linkages were strengthened when the VBA program helped established trust between VBAs and market actors and when the program selected VBAs who were entrepreneurially minded.** Interviewees noted that VBAs were able to establish good working relationships with input suppliers and off-takers when implementing partners helped facilitate those arrangements and vouch for VBAs. Market actors were more likely to work with VBAs when a well-known implementing partner made the introduction to VBAs. Establishing and maintaining trust between VBAs and market actors over the duration of the relationship was also frequently cited as a key factor of success. Some input suppliers, for example, provided an increasing amount of product in advance of payment to VBAs over time as they continued to develop trusting relationships. Finally, implementers noted VBAs who were "entrepreneurially minded" were more able to sustain business and be proactive in finding customers and building trust with market actors. As one implementer noted:

> *We are talking about people who know that in the agricultural sector there is business to be done for the provision of agricultural services and products, it is also agricultural businesses. They can sell these services because they have this entrepreneurial spirit and make better use of their work.* (Implementer, Burkina Faso)

**VBAs were more likely to become market actors themselves when faced with poorly integrated value chains in which they could find a niche for operations.** VBA market

linkages were also stronger in geographies in which there was relatively low competition of competing agri-dealers. In Kenya, for example, an expert we interviewed with high visibility across countries noted that in Kenya there is high market penetration, with an agri-dealer in nearly every village, making it more difficult or VBAs to establish a foothold in the market. Whereas in Mozambique, the lack of competition among both village-based input suppliers and aggregators allows VBAs to establish small businesses more easily. However, VBAs were able to more easily thrive and link farmers to the market in places with a great number of downstream actors, such as seed companies and grain buyers. In Tanzania, for example, the lack of large grain purchasers made it more difficult for VBAs to engage in aggregation activities; whereas in Nigeria, the larger number of seed companies and grain buyers allowed VBAs to perform that critical market linkage.

The components that maximize VBA's opportunity to forge strong market linkages are outlined in the text box below. While program components can promote these linkages, contextual factors are highly determinative.

**CONDITIONS CONDUCIVE TO A STRONG LINKAGES WITH MARKET ACTORS**

**Program conditions**

- Facilitated linkages with suppliers and offtakers
- VBAs have an "entrepreneurial" mindset
- Business development support

**Country conditions**

- Open niche in local supply and off-taking markets
- Sufficient infrastructure (for example, transportation and warehouses)
- Access to credit for VBAs
- Lack of government input subsidy program that excludes agripreneurs as sellers (input markets)
- Relatively low and stable prices for inputs (inputs markets)
- Relatively high and stable/predictable prices for product (output markets)
- Pre-existing farmer groups/cooperatives (output markets)

**Public sector systems-level changes**

**Respondents, including extension officials, across all countries found that the VBA model complemented the public extension and advisory system, and extension officials strongly support the program.** Implementers and government extension officials emphasized that the VBAs have been an important support in addressing the extension agent-to-farmer ratio gap. Before the program, stakeholders reported that extension agents rarely or never visited some areas, but working with VBAs enabled extension training to reach farmers in these communities:

> *[The VBA program] really helps our work, places we cannot reach, we use them to reach to the people, and we interact with the communities on regular basis, so it really consolidated our work and they are still doing that.* (Extension official, Nigeria)

The role of VBAs was important in the Kenyan extension system, for example, where VBAs are reportedly beginning to fill service gaps in areas of government devolution of central authority to the counties. An extension official from one area explained that they would be training VBAs to take over some services, in part due to resource constraints tied to devolution. In one area where the ward extension official was planning to retire and there had been delays in finding a placement, he stated his belief that trained VBAs would be able to work alone without extension official oversight to continue providing services to farmers.

> *The truth is, we don't have much resources in the counties which have been devolved, but people are just hoping things would work…. We are still planning to train the VBAs thorough so they can also take over certain services like layout of soil and strengthening conservation. They need some knowhow and some experience to do the right thing…. During the first phase, we trained all but within a very short time and I believe, may be before I exit, we shall train more and retrain more so that they can know how to use this board [soil leveling kit], they know how to use it to lay the contours.* (Extension official, Kenya)

**Public extension staff frequently cited instances of integration between the VBA model and the local extension program.** For example, implementers said that extension agents closely coordinated with the VBA program in multiple ways: they supported the selection of VBAs, oversaw VBA activities with farmers, and either directly trained VBAs on context-specific good agricultural practices or worked with program implementers to participate in VBA trainings. Extension agents trained VBAs on practices such as proper seed spacing and fertilizer use, and in Kenya and Burkina Faso also covered regenerative agriculture and water conservation techniques. VBAs would then bring these practices to farmers within their communities thereby expanding the reach of the traditional extension agents. The relationship between the VBAs and government extension agents also continued after program implementation ended. Our survey data found that in all countries except Nigeria, VBAs had been trained or contacted by government extension officers at least twice during the past six months, and the majority found government extension officials to be helpful (Table 8). The relationship appears mutually beneficial because VBAs allow extension agents to reach more of the farmers in their areas, while extension agents, who have more technical agricultural knowledge and training, provided VBAs with guidance on challenges their farmers are facing. In Nigeria, one VBA provided examples of coordination with the extension agents:

> *So we snap pictures [of farming and crop issues] and send them to the extension agents. If there is any correction, they tell us about it and we adjust it. Sometimes they even call us themselves to check if there are issues or problems. In a month, [VBAs] have two to three meetings with [their extension agent], there we discuss issues and share ideas.* (Woman youth VBA, Nigeria)

**Table 8. Percentage of VBAs who said government extension officers are very helpful**

| | Burkina Faso | Nigeria | Kenya | Tanzania | Mozambique | All |
|---|---|---|---|---|---|---|
| Total survey respondents | *200* | *200* | *229* | *200* | *203* | *1,032* |
| Number of times VBAs received training conducted by government extension officer in last six months | 2.0 | 1.3 | 2.0 | 2.6 | 2.0 | 2.0 |
| VBA finds government extension officers helpful | 95% | 78% | 86% | 79% | 76% | 83% |

**Close collaboration with VBAs allowed extension officials to better understand challenges faced by farmers.** Extension officials reported that they no longer had to visit every village to diagnose or identify their farming challenges, instead they were able to rely on VBAs to provide village-specific information. In Kenya, one extension official noted:

> *It is a two-way [model]…. We can't say we are the ones who are giving them information, we also get information from them. There is a lot of indigenous knowledge which they can bring. When we are discussing, some [VBAs] say ''this problem has been solved by doing this or I discovered a farmer who is doing something very unique'' and we go there. Even diseases, they are discovering quite a number of diseases—they come and tell us there is something unusual about a certain crop and we can call research people to come and work on it. So it is a two-way [model].* (Extension official, Kenya)

**Extension officials and implementers across almost all countries have advocated for the formal inclusion of VBAs into their national and subnational policies and budget allocations.** In Burkina Faso, the Ministry of Agriculture has formally adopted the VBA model, aiming to scale up the approach within the extension system throughout the country. In these efforts, extension officials and implementers highlight how VBAs support the public extension system. In Kenya, the VBA model has been included as an extension approach in the Kenya Agricultural Sector Extension Policy (2022), with funding and investments for supporting private sector extension services to exist alongside the public extension program. In these advocacy efforts, extension officials and implementers highlight how VBAs support the public extension system. In Nigeria, implementers recommend that future VBA programs also invest in capacity strengthening of extension officials themselves, as they serve a critical role in supporting and overseeing VBAs. The experts we interviewed also emphasized the importance of formalizing the relationship between VBAs and government institutions that can scale and sustain the program through formal adoption into the government program or through support and official recognition of the VBA program in its current form.

**However, the implementation of and budget allocation for VBA-related policies may be subject to local political considerations**. For example, in Kenya, one expert explained that although the local government was a proponent of the model, they were voted out of office, requiring new advocacy efforts for buy-in with the new administration. Additionally, the devolution of governments in Kenya and Tanzania may bring constraints around fund allocation toward VBAs. The strength and priorities of the national government may also be an important factor in the sustainability and scalability of the VBA model. In Tanzania, an expert explained

that the government is currently exhibiting strong interest in the extension system, providing resources such as motorcycles and digital equipment that they likely would not have shown interest in seven years ago.

## Sustainability

### Evidence of VBA model sustainability

**There is evidence of sustainability even after AGRA support has ended, as VBAs continue in their role of connecting farmers to markets and extending extension support.** In all countries, some VBAs who have set up businesses have simply maintained those businesses along with the farmer contacts who have become their customer base. As indicated in Figures 3 and 4, not all VBAs were earning income or successfully starting businesses; however, given the challenging economic environment in rural areas, we might not expect a high percentage of VBAs to do so without financial support. VBAs report that they not only continue to sell inputs or aggregate products but they also continue to train farmers and be a resource to them when they have questions on agricultural practices. In many countries extension officers also continue to use VBAs to reach a larger number of farmers.

**Some VBAs have gained more employment due to skills gained as VBAs**. For example, in Nigeria, seed companies reported having hired VBAs as agents. In Kenya and Burkina Faso, some VBAs were absorbed into a public extension program. In Tanzania, many VBAs were hired in similar roles by other agricultural nongovernmental organizations. While these examples do not necessarily speak to the sustainability of the VBA program, they do indicate that VBAs gained skills that will support their livelihood as individuals.

**The primary sustainability pathways are through being formalized in a public sector program or through maintaining a sustainable agribusiness.** Possibly one of the quickest pathways for scale is through the wholesale adoption of the program into the national extension system. This is currently in process in Burkina Faso where the Ministry of Agriculture has formally adopted the VBA model and is aiming to scale up the approach within the extension system throughout the country. The security situation and limits on mobility made the government was even more reliant on VBAs to extend the reach of extension agents, who are not allowed into some areas of the country. Interviewees also report that there are discussions of formally adopting the VBA program in Nigeria. Specifically, implementers in Nigeria are advocating for the passage of a national bill that would create an agency that formally recruits VBAs to provide last-mile extension services in partnership with public extension agents.[8] In countries in which more decision-making authority is devolved to the states or counties, the main pathway is through adoption at those lower levels. In both Kenya and Tanzania, county-level officials report interest in incorporating the VBA program or mimicking the program by using some kind of village-based farmer/trainer.

**Some VBAs were continuing their VBA work due to their newfound position in the market.** The private sector avenue for sustainability offers a win-win in which input suppliers, for example, benefit from VBAs networks, and VBAs maintain a source of income from commissions, thus creating an interlinked sustainability mechanism.[9] With such a strong and

[8] Information on the national budget implications was not available at the time of our report.
[9] In Nigeria, the commission was around ten percent and set by seed companies.

mutually beneficial relationship, VBAs can sustain themselves in this role. As one implementer noted:

> *If there's a good linkage between them [VBAs] and market actors, they can both do business. They can do business because, uh, these big companies do not have to go down to the village level. To start, uh, establishing their own distribution network. Yeah. If the VBAs are already there, they just sit back down running.* (Implementer, Tanzania)

There is some concern, however, that if sustainability occurs primarily through the private sector, then training farmers might take a "back seat" to maintaining a profitable business. In addition, if there is no continual training of VBAs, their knowledge could become dated and motivation for providing extension might decrease.

**Strategies for sustaining the model**

**The VBA model has multiple sustainability pathways, each requiring a different strategy. The private market sustainability pathway requires more intensive selection, training, and financial support.** The comparator programs we examined that had more of a focus on agri-entrepreneurship saw the majority of their agri-entrepreneurs "graduating" from the program. However, these programs work more intensely with their agri-entrepreneurs, have more rigorous selection processes, and also higher investments per agri-entrepreneur. One comparator program, the Syngenta Foundation's Agri-Entrepreneur (AE) program in India, sees about 75 percent of its AEs "graduate" from the program after establishing successful businesses. One component is, of course, intensive business development support, but another is in the initial selection process, which includes minimum educational requirements and psychometric testing to select for the type of AE who can succeed in business. The Farm to Market Alliance program also credits its success in nearly all its Farmer Service Center leaders earning income to mainly "selecting the right people" who have the capacity to sustain a business and are respected in the community. While these agri-entrepreneurs are often trained to provide extension support, it is not the primary focus of the model. If AGRA is to follow this model, it would require a different cost structure, shifting more resources to business development training and initial selection and overall higher investment per VBA. This model might also help attract more youth who are keenly interested in income generation.

**The public sector sustainability pathway requires strong relationships with government actors and formal links with government institutions.** Experts and interviewees from all countries stressed the importance of establishing strong, favorable, and productive links with public sector actors in order to encourage sustainability of the program. Specifically, they report that formal recognition of VBAs by government in policies and budget allocations is important for sustainability. Government support can help by formally incorporating and scaling the program. But even formal recognition, without institutionalization, can help by giving VBAs a more official status and smoothing the way to interact with both market actors and farmers. A visible "seal of approval" from the government can make it easier for VBAs to forge new relationships with farmers and also give private actors more confidence in doing business with VBAs. This pathway does not necessarily dictate that the agri-entrepreneurship aspect of the program would disappear; however, it would mean that the expectations for the percentage of VBAs who are successful business owners might be lower.

**However, the VBA program is unlikely to be fully sustainable without continued support to solidify relationships and help VBAs overcome known challenges.** While the interview and survey responses found evidence of VBAs continuing in their work in some areas, we also found that it would be challenging for the program to sustain itself at peak levels of VBA activity without additional support. A number of interviewees, include extension experts, noted that it could take longer than three to four years to solidify the public and private sector relationships and ensure that VBA activities are sustained over the long term.

> *It's true as I said, it's the duration of the project that does not stabilize the results. After 3 years, the program still needs support, because we must maintain relations between VBAs and partners. The bonds must be strong before we withdraw.* (Implementer, Burkina Faso)

Some note the inherent challenges of relying solely on the private sector avenue for sustainability, with one expert stating, "If it is subsistence farmers (they are targeting), they [VBAs] may not recover costs unless we invest in them." Others cited the relatively low profit margins and seasonal nature of inputs sales as challenges. VBAs themselves note the lack of access to credit as another major impediment to starting a sustainable business. Some interviewees suggested implementing support such as start-up grants, loans, or even storage collection centers that can be co-owned by VBAs. All this points to the need for major investment in training support as well as start-up capital if a private sector sustainability pathway is to be prioritized. Many implementers noted the need for continued or refresher training to ensure that VBAs remained motivated and had current information. As one extension official provider noted:

> *They* [VBAs] *may continue to work* [after AGRA funding ends] *but not at the same rate or to the same level as they were the first time, you know there is that tendency to forget, so, you need to be reminded every time.* (Extension official, Tanzania)

## Theory of change assessment

While not all elements of the full ToC were in scope for this evaluation (such as an increase in farmer profits), we were able to evaluate many of the ToC components and assumptions. The overall *logic* of the ToC—that VBAs should expand the reach of extension, improve farmers' practices and harvests, and generate income for VBAs themselves—held. However, upon conducting this evaluation we made a distinction between the two systems change pathways illustrated in the ToC in Figure 1. There is a systems change pathway to improved resilient supply and demand of extension programs, generally through the public sector. There is also a distinct pathway for private sector systems change, which occurs as VBAs strengthen links to input and off-taking markets and accelerate their own involvement in those markets. These pathways are also in line with AGRA's systems change framework in which the "vital signs" of a health system include profitable market performance, strong supply and demand of public and private products and services, and a healthy enabling environment.

In addition, the initial ToC did not include an explicit pathway for VBAs to earn income through improving their own practices and yields. However, the survey data showed that, from the VBAs' perspective, this was the greatest benefit of the program to their own livelihoods. Therefore, we added pathways from VBA establishing demonstration plots and conducting training to their own improvements in income.

We assessed the pertinent components of the ToC and related assumptions, as indicated in Table 9. We found relatively strong support for the early outcomes related to training and connection to input suppliers, but mixed support for connections to off-takers. We also found strong support for the impact of the VBA program on the reach of the extension program but mixed support for VBAs' ability to earn income. However, many of the key assumptions related to VBA-level impacts are only partially held. For example, the desire and ability of women to become VBAs was lacking in many countries, digitization infrastructure was sometimes inadequate, and access to financing was lacking. Overall, VBAs appeared to be generally successful in expanding the reach of extension and improving market linkages. However, the lack of access to capital and challenges in connecting to off-taking markets, weak infrastructure, and lack of programmatic focus on entrepreneurship mean that it would be difficult to sustain the program purely through market systems.

**Table 9. Assessment of theory of change**

| ToC element | Assessment |
|---|---|
| **Early outcomes** | |
| VBAs establish demo plots, train men and women farmers, and distribute minipacks of seeds and fertilizers | **Strong support**. VBAs appeared to be engaged in each of these activities and reported not only training farmers on good agricultural practices but applying them themselves. |
| VBAs connect farmers to input suppliers, mechanization services and finance; VBAs start input supply SMEs | **Moderate support**. Survey indicates that just more than 50% of VBAs were making money in connecting farmers to markets and only 20% were starting their own businesses, suggesting there is room to facilitate more connections to markets. |
| VBAs connect farmers to off-takers | **Mixed support**. Interviewees in all countries, except Mozambique, noted that connecting farmers to off-takers was very challenging and was less supported and occurred less frequently than connections with input suppliers. However, our VBA survey results contracted this somewhat with a relatively higher percentage of VBAs reporting earning income in off-taking than providing inputs in Burkina Faso, Nigeria, and Mozambique. |
| **Intermediate outcomes** | |
| Extension program reaches more farmers with higher quality training | **Strong support**. VBAs were able to expand the reach of extension good agricultural practices training and the farmers we interviewed were favorable in their assessment of this training. Many also reported that the training was more effective due to the VBAs' ties with the communities. |
| Farmers adopt good agricultural practices production and postharvest practices (including those related to climate change adaptation and nutrition sensitive agricultures) | *Not assessed.* |
| Farmers adopt improved inputs, including climate smart seed and nutrient dense seed | *Not assessed.* |
| Farmers increase market sales | *Not assessed* |
| VBAs earn additional income | **Mixed support.** 50% of VBAs reported earning some income, but there was lots of variation among countries. In addition, it is not clear how stable the income is over the year and to what degree VBAs are making profit rather than just revenue. |

| ToC element | Assessment |
|---|---|
| **Farmer/VBA outcome** | |
| Farmers yields improve | *Not assessed* |
| Farmers income, profit, food security, resilience and nutrition improve | *Not assessed* |
| VBAs sustain involvement | **Mixed support.** There is some evidence the VBAs are continuing to sustain their work even as funding has ended, both training farmers and continuing to connect them to markets. However, without a consistent funding source or repeated training it is unlikely that the VBA program will be sustained at its peak levels. |
| **Systems level outcome** | |
| Improvement in rural advisory/extension system | **Moderate support**. The existence of the VBA program has expanded the reach of extension services and worked collaboratively with public extension programs. Some public programs have absorbed VBAs formally or adopted similar models. |
| **Assumptions (related to VBA pathways)** | |
| Governments implement policies that support sustainable market-led, pluralistic, and coordinated extension | **Partially holds.** Government policies were generally not perceived to be large impediments to the VBA program. However, some input subsidies could make it difficult for VBAs to earn income and some licensing requirements make it difficult for VBAs to start businesses. |
| Digitalization infrastructure is adequate | **Partially holds.** In Nigeria many VBA smartphones were incompatible with the digital application. In Mozambique, cell phone connectivity is a challenge and many farmers, particularly women farmers, do not have access to cell phones. |
| Inputs are accessible and available | **Largely holds.** Inputs were generally available to VBAs, but the prices were often too high and financing was a consistent challenge. |
| Financing/credit to VBAs is accessible and available | **Does not hold.** VBAs across all countries noted that they struggled to get the credit they needed to support their income-generating activities. |
| Women want/are able to become VBAs | **Partially holds.** In Kenya women were able to become VBAs. In other countries with more restrictive gender norms, it was difficult to attract and retain women VBAs. |

## Recommendations

Our findings suggest that there are a range of program refinements that have the potential to make the program more effective and sustainable in the future. Some recommendations involve specific aspects of the model, while others involve adapting the way the model is implemented in each country.

**Assess each country of operation to determine the appropriate sustainability pathway.** There is wide variation among countries in terms of the percent of VBAs who are able to successfully earn any income or start their own businesses. In countries with well-established markets of agri-dealers, for example, there may not be much room for VBAs to fill that market connection role. VBAs have a better chance to thrive as agri-entrepreneurs in countries, like Mozambique, that have less competition. In addition, some counties have national and county-level governments quite favorably disposed to expanding the reach of their extension program. AGRA should assess each environment to determine the likely sustainability pathway and design programs and targets for each environment, potentially using an assessment checklist as indicated previously. Countries with a gap in last-mile delivery but otherwise strong input and output markets are good candidates for an agribusiness sustainability pathway. Countries that

lack those conditions but have a robust public commitment to extension might be better candidates for a public extension sustainability pathway. For example, in Mozambique and Nigeria, AGRA might assess those countries as being more conducive to a market-based sustainability pathway and then set a target for 60 percent of VBAs to be agri-entrepreneurs, whereas in Kenya AGRA could set a lower agri-entrepreneur target but a larger target for government and policy advocacy. This would also likely involve a change in focus for VBA activities (training, AGRA supports, and so on) in each country.

**Facilitating access to credit, business start-up support, and a broader basket of goods and services can help VBAs earn more reliable income.** AGRA should consider supporting VBAs with start-up capital and increased business development support if the goal is to ensure that they sustain viable businesses. VBAs across all countries cited the lack of credit as limiting their ability not only to set up businesses but also to operate as go-betweens from farmers to input suppliers who often require upfront payment. Additionally, if meaningful income for VBAs is a primary goal, AGRA should provide more supports to ensure that VBAs can earn income not just at planting and harvest time but throughout the season by broadening the range of income-generating activities, including providing vegetable seeds and poultry (both of which also have nutrition benefits) as well as mechanization and value-addition activities.

**Formalize a relationship with government actors to promote sustainability**. Given the overall support of the public extension programs for the VBA model and their expressed interest in formalizing the partnership between VBA and extension agents, AGRA should work with extension programs to have VBAs recognized as partners during program implementation. This could happen through a formal certification recognizing that VBAs completed a minimum level of training and are working closely with extension agents. In addition, we found that visible symbols such as t-shirts or identity cards might increase the recognition of VBAs and shorten the time to gain the trust of farmers. In addition, the closeout of AGRA's financial support should involve a process whereby VBAs are formally incorporated into the public extension program or recognized by local extension offices via memoranda of understanding or other official agreements.

**To encourage more youth to become VBAs, AGRA should focus on the aspects of the program that are most attractive to youth.** Because younger VBAs are at a different life stage, they have unique needs and concerns that affect their participation in the VBA program. For one, they are likely to be more influenced by peers and concerned about community acceptance and opportunities to increase their skills. Branding to increase their visibility in the community and access to technology appear to be important aspects of the program for youth. In addition, younger VBAs are seeking income-generating opportunities and are more likely to remain in the program if it offers a reliable income. At the same time, they tend to be even more capital constrained and in need of mentorship than older, more established VBAs. In order to increase the share of younger VBAs in the program, AGRA should consider adding special programs for youth. For example, additional financial supports targeted to youth (loans or grants) coupled with mentorship aimed at young entrepreneurs could help them start businesses and maintain the businesses through the start-up phase. Offering a program like this should also include a plan for monitoring and rapid assessments to figure out how to fine-tune the specific interventions that work for youth.

**To include more women as VBAs, AGRA should consider ways of addressing cultural norms through working directly with community leaders and focusing on women-dominated crops.** Most interviewees reported that women make excellent VBAs, working tirelessly and reaching more farmers. They also note that women are better at reaching and relating to women farmers. However, many areas struggle to recruit and retain women VBAs. Because the major barriers for women VBAs are cultural, AGRA should consider programs to build community-level acceptance of women as VBAs by working in concert with religious and community leaders. In addition, AGRA can consider carving out a niche for women VBAs to focus attention on crops and value chain activities that are more traditionally considered women dominated, as this would face fewer cultural barriers. However, AGRA would need to take care that this focus does not simultaneously limit the income-generating opportunities for women.

**While digital platforms are just starting their roll-out, AGRA should conduct an early assessment of implementation challenges to conduct course corrections and clarify the strongest likely pathways along the theory of change.** While this evaluation was not able to assess the full roll-out of digitization due to the timing of data collection, we did uncover several emerging challenges that warrant attention. Application use was hindered by compatibility and connectivity issues, and some VBAs report wanting additional training in order to fully understand the application capabilities. Some interviewees expressed doubt on the applications' ability to materially improve farmer training, but there was more interest in the potential to better connect VBAs with input and off-taking markets. Further, VBAs and implementers were not wholly clear on the primary function of the digitization. If the VBA program is to be successful, early implementation challenges should be identified and addressed and the pathway for change should be clearly articulated and emphasized to implementing partners, VBAs, and farmers. This situation is ripe for a formative or rapid cycle evaluation to identify challenges and propose more immediate course corrections.

**AGRA should consider greater focus on promoting improved nutrition and climate-smart practices as a regular part of VBA training.** AGRA 3.0 strategy prioritizes both climate resilience and improved nutrition as key cross-cutting issues. However, outside of Kenya, none of the VBA programs formally emphasized these priority areas that have farmer behavior change at the heart of their theories of change. The VBA program is a key avenue for promoting practice changes, and AGRA should capitalize on the program’s reach to promote these practices more broadly.

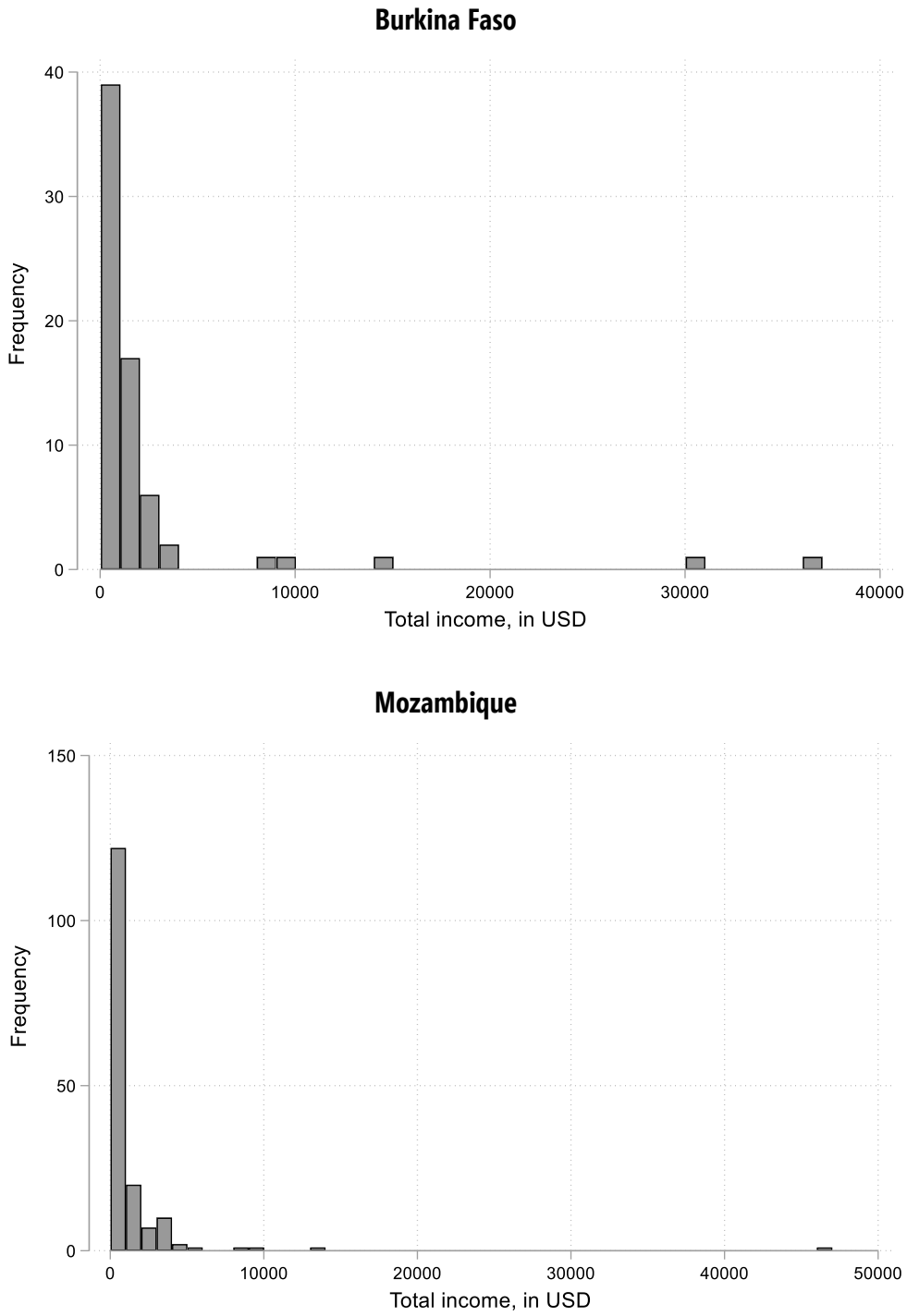
# Appendix A

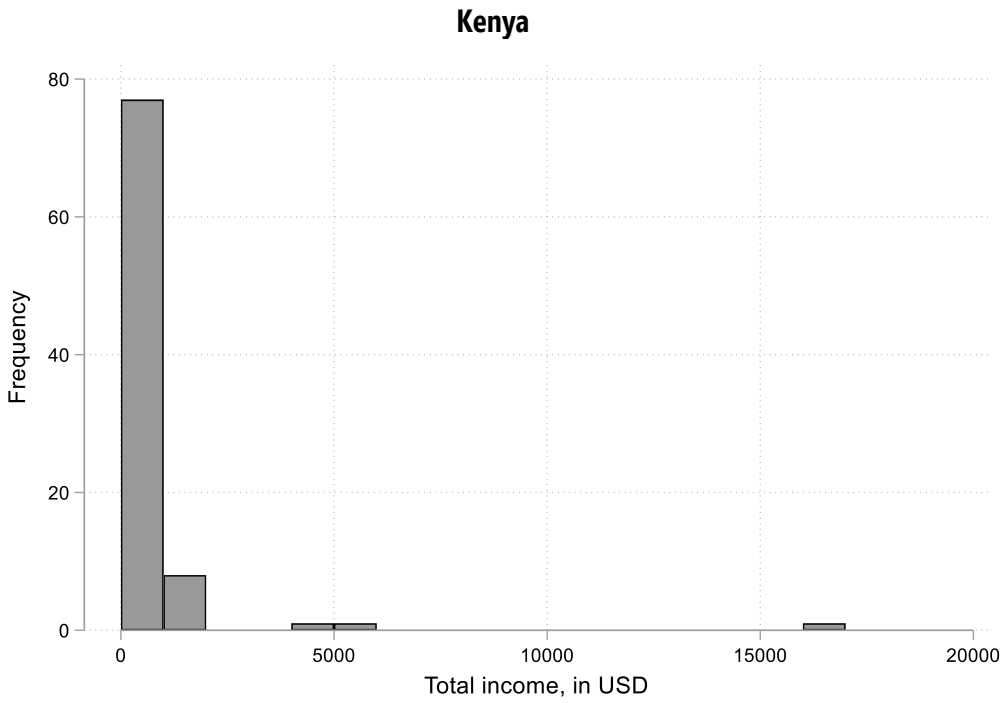
**Table A.1. Cost information received by country**

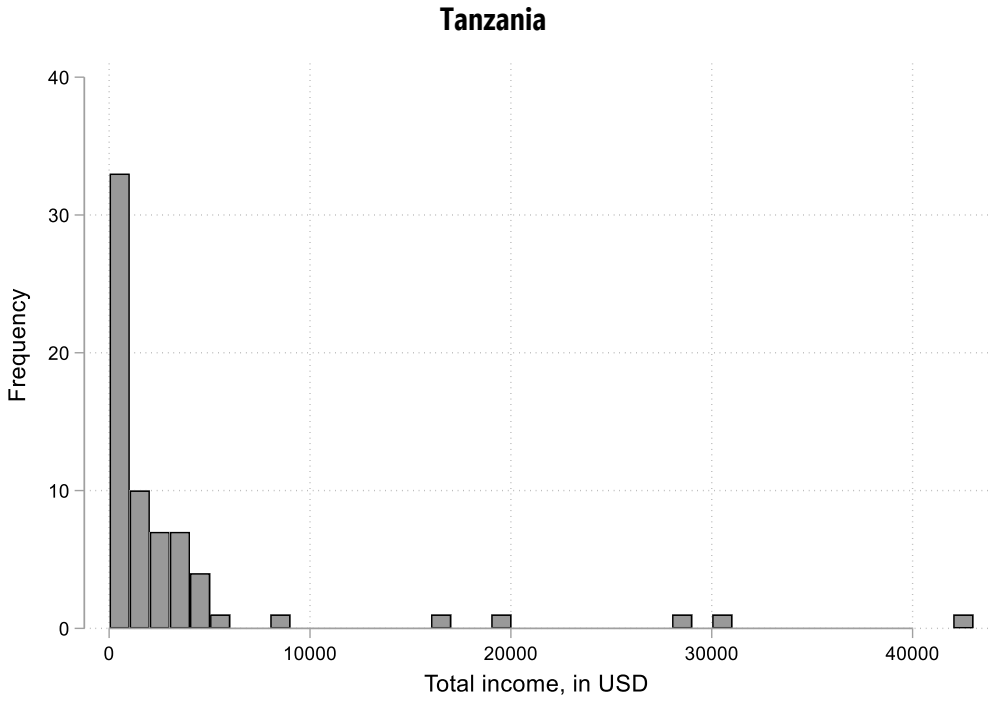
| Country | Cost information received |
|---|---|
| Kenya | Three-year LDRI Budget (2019); Total costs for IKEA–Farm Africa and IKEA–CGA |
| Tanzania | Summary program costs provided by AGRA staff |
| Mozambique | Expenses for program consortia members (UPCT, MICAIA, ISPM, AENA, AFAP, Kulima, Agrimerc, and Luteari, 2017–2022) |
| Burkina Faso | GRADcg Total Budget; three-year APME2A Budget |
| Nigeria | Total costs by program partner (Kaduna, Niger, NAERLS, Value Seed, NANTS, and EXAF) |

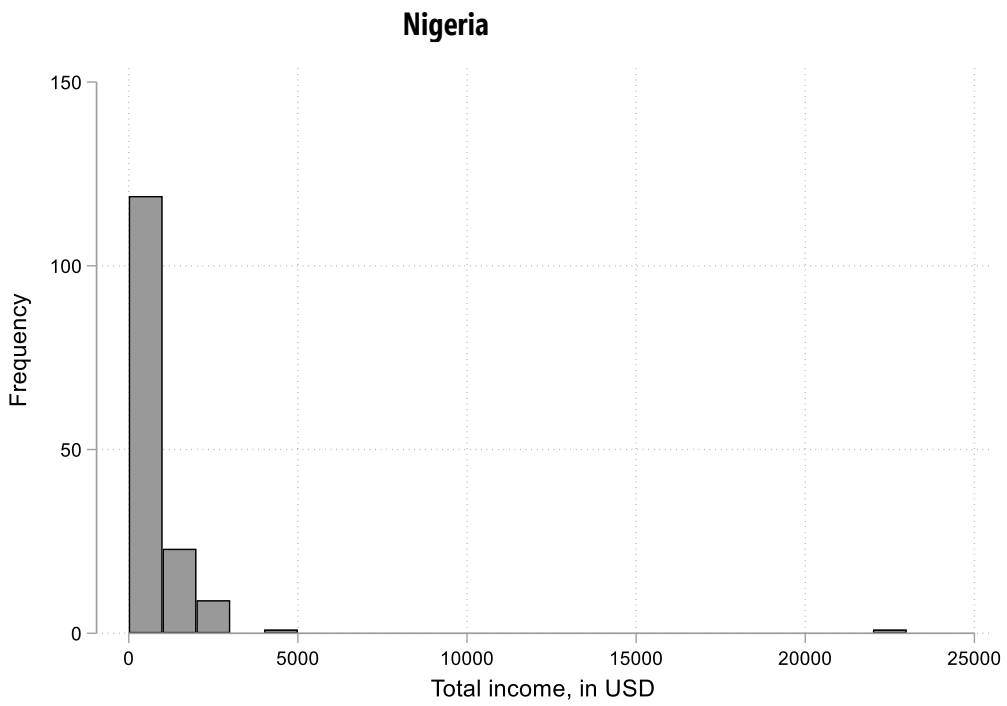
# Appendix B

**Figure B.1. Distribution of total income made from selling inputs and aggregating crops, by country, in U.S. dollars**




Kenya
Frequency
0
20
40
60
80
0
5000
10000
15000
20000
Total income, in USD


Tanzania
Frequency
0
10
20
30
40
0
10000
20000
30000
40000
Total income, in USD


Nigeria
150
100
50
0
Frequency
0
5000
10000
15000
20000
25000
Total income, in USD

# Appendix C

**Table C.1. Top challenges of being a VBA, by country**

| | Burkina Faso | Nigeria | Kenya | Tanzania | Mozambique | All |
|---|---|---|---|---|---|---|
| Total survey respondents | 200 | 200 | 229 | 200 | 203 | 1,032 |
| Not enough financial assistance for VBA duties | 42% | 53% | 48% | 26% | 23% | 39% |
| Insufficient transportation | 45% | 46% | 22% | 39% | 40% | 38% |
| Difficult to reach enough farmers | 23% | 37% | 22% | 31% | 12% | 25% |
| Not enough income | 14% | 42% | 25% | 9% | 14% | 21% |
| Training was insufficient | 26% | 16% | 11% | 39% | 8% | 20% |
| Farmers are not interested in being trained | 7% | 25% | 16% | 18% | 4% | 14% |
| Difficult to balance farm work with VBA duties | 7% | 30% | 12% | 8% | 13% | 14% |
| Lack credit to start business | 3% | 44% | 3% | 19% | 4% | 14% |
| Difficult to build connections in the market | 8% | 28% | 2% | 18% | 11% | 13% |
| Business registration process is challenging | 2% | 47% | 0% | 11% | 2% | 12% |
| Other | 5% | 5% | 8% | 4% | 13% | 7% |
| Access to inputs | 5% | 0% | 17% | 2% | 11% | 7% |
| None | 2% | 8% | 8% | 9% | 9% | 7% |
| I moved away from the area | 9% | 9% | 0% | 10% | 0% | 6% |
| Farmer mistrust | 1% | 0% | 11% | 2% | 0% | 3% |

Source: VBA phone survey, December 2022.

Note: Top challenge for each country is shaded in dark grey and the second and third most commonly cited motivations are shaded in light grey.

# Appendix D

**Table D.1. Top challenges for VBAs selling inputs**

| | Burkina Faso | Nigeria | Kenya | Tanzania | Mozambique | All |
|---|---|---|---|---|---|---|
| Total survey respondents | 29 | 104 | 62 | 64 | 104 | 363 |
| Input prices are too high | 53% | 63% | 40% | 64% | 14% | 45% |
| Inputs not available when farmers need them | 17% | 35% | 22% | 66% | 21% | 33% |
| The nearest input suppliers are too far | 14% | 38% | 34% | 11% | 28% | 27% |
| Farmers are waiting for subsidized inputs | 11% | 68% | 13% | 21% | 4% | 27% |
| Did not receive enough support to build networks | 7% | 38% | 6% | 19% | 12% | 19% |
| Other | 0% | 4% | 30% | 8% | 39% | 19% |
| Poor quality of inputs blamed on VBA | 24% | 33% | 15% | 8% | 6% | 17% |
| There is already a retail input seller in the village | 10% | 30% | 9% | 6% | 8% | 14% |
| Farmers do not want many inputs | 3% | 29% | 3% | 9% | 4% | 12% |

Source: VBA phone survey, December 2022.

Note: Top challenge for each country is shaded in dark grey and the second and third most commonly cited motivations are shaded in light grey.

**Table D.2. Top challenges for VBAs aggregating crops**

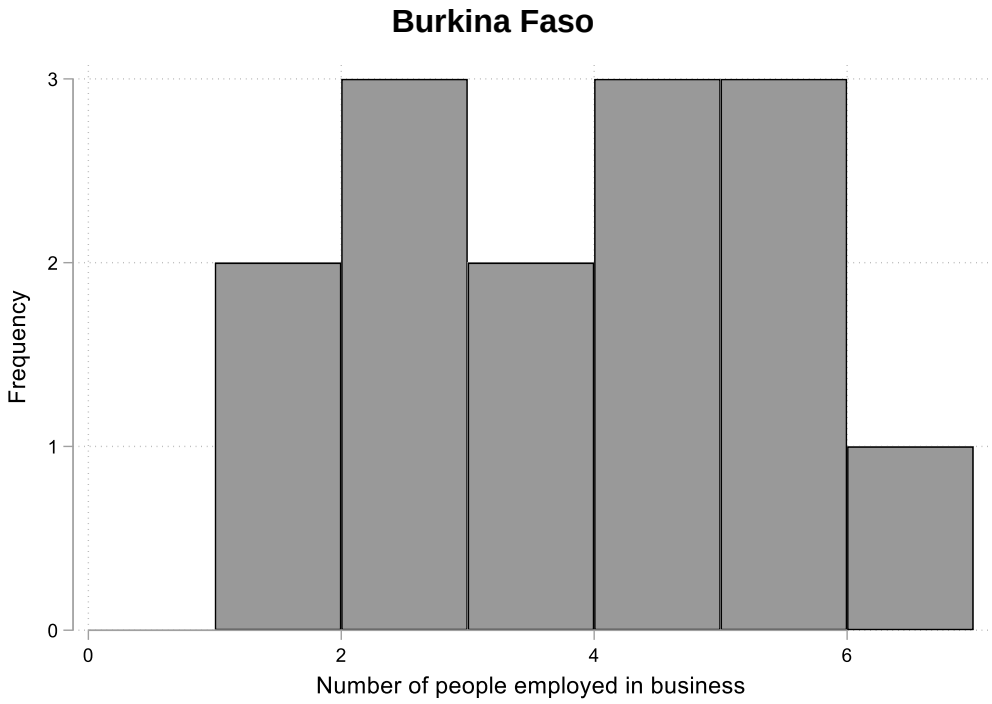
| | Burkina Faso | Nigeria | Kenya | Tanzania | Mozambique | All |
|---|---|---|---|---|---|---|
| Total survey respondents | 93 | 109 | 57 | 53 | 154 | 466 |
| Fluctuations in output prices cause price disputes | 62% | 63% | 45% | 80% | 9% | 45% |
| Farmers sell their produce to other buyers | 39% | 44% | 19% | 39% | 10% | 28% |
| Challenges connecting farmers to off-takers? other | 6% | 4% | 28% | 14% | 53% | 25% |
| Too many aggregators in the area | 27% | 48% | 12% | 21% | 8% | 24% |
| Farmers face difficulty meeting off-takers' quantity demands | 8% | 37% | 14% | 19% | 11% | 18% |
| Farmers face difficulty meeting off-takers' quality demands | 5% | 33% | 17% | 20% | 11% | 17% |
| There are more input suppliers than off-takers | 11% | 28% | 9% | 18% | 4% | 13% |
| None | 9% | 9% | 16% | 3% | 14% | 11% |

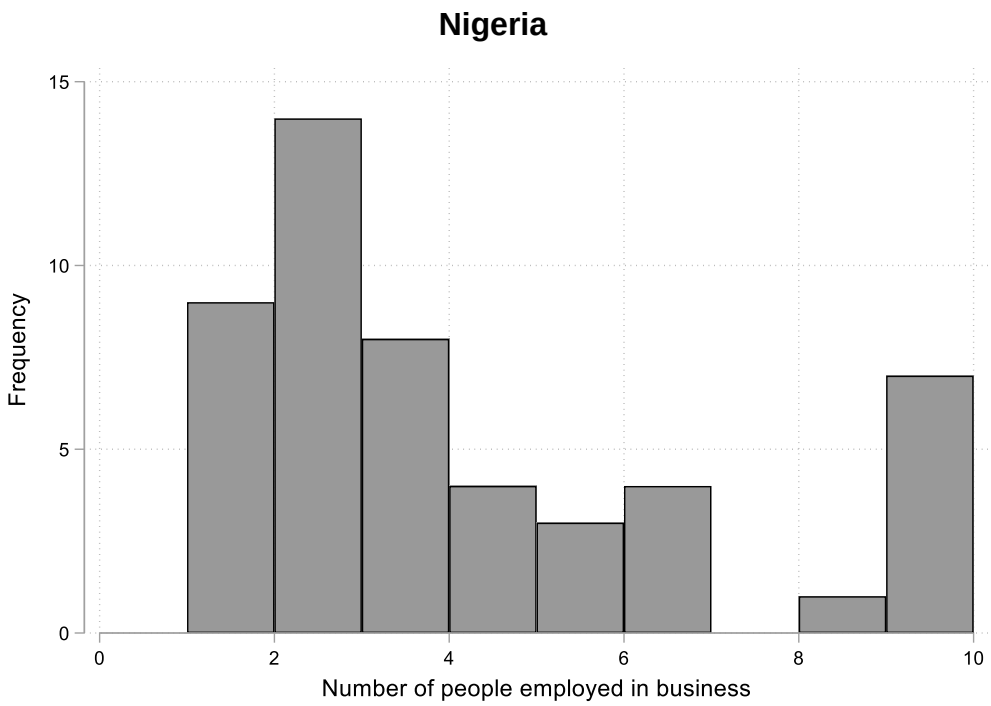
Source: VBA phone survey, December 2022.

Note: Top challenge for each country is shaded in dark grey and the second and third most commonly cited motivations are shaded in light grey.

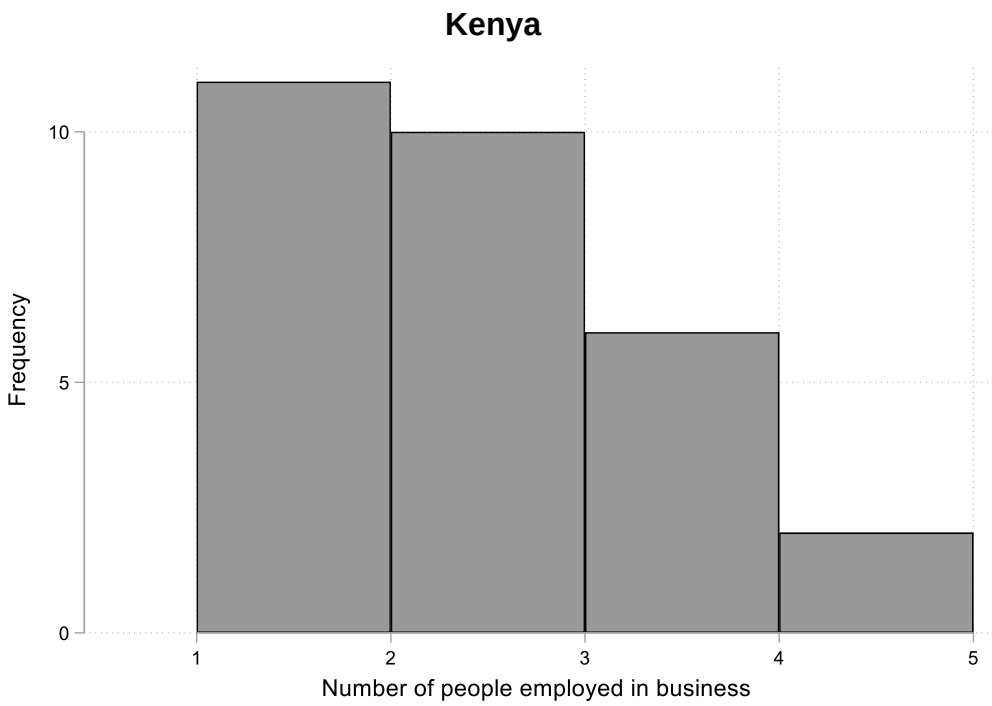
# Appendix E

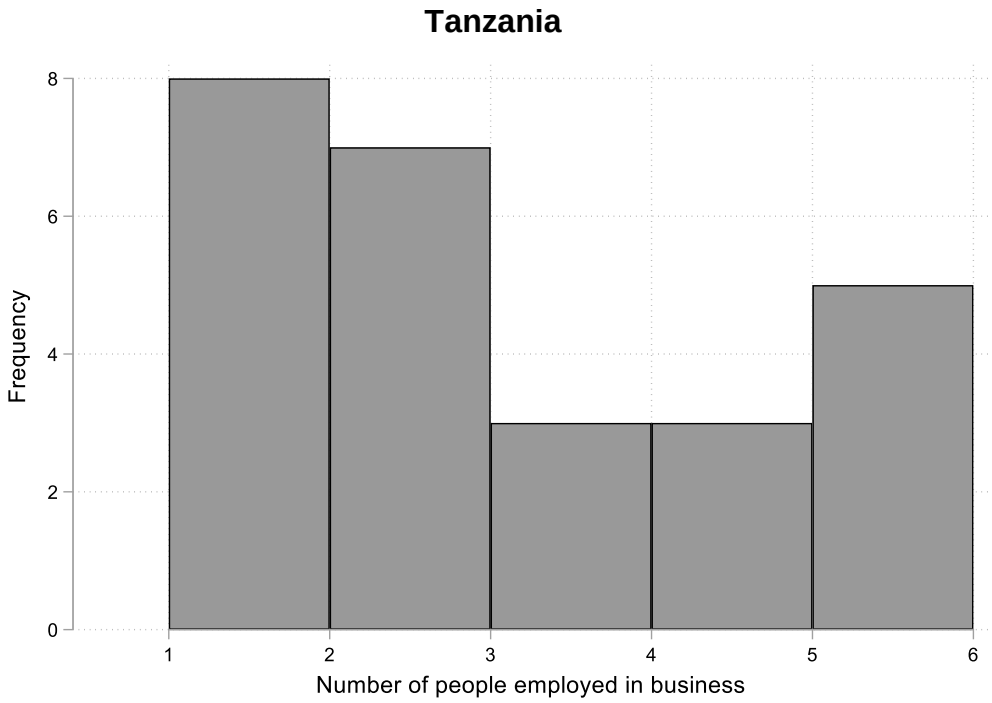
**Figure E.1. Distribution of employees, by country, among VBAs with employees**




Nigeria
Frequency
0
5
10
15
0
2
4
6
8
10
Number of people employed in business


Mozambique
Frequency
0
5
10
15
0
2
4
6
8
10
Number of people employed in business


Kenya
Frequency
0
5
10
1
2
3
4
5
Number of people employed in business


Tanzania
Frequency
0
2
4
6
8
1
2
3
4
5
6
Number of people employed in business

# Appendix F

**Table F.1. Median total income generated from VBA activities (USD), by gender and country**

| | Burkina Faso | | Kenya | | Mozambique | | Nigeria | | Tanzania | | All | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female |
| N | 49 | 20 | 41 | 47 | 143 | 23 | 93 | 60 | 33 | 35 | 359 | 185 |
| Median | $988 | $672 | $122 | $178 | $620 | $310 | $563 | $338 | $860 | $1,247 | $574 | $338 |

**Table F.2. Median total income generated from VBA activities (USD), by age group and country**

| | Burkina Faso | | Kenya | | Mozambique | | Nigeria | | Tanzania | | All | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Youth | Non-youth | Youth | Non-youth | Youth | Non-youth | Youth | Non-youth | Youth | Non-youth | Youth | Non-youth |
| N | 16 | 53 | 14 | 74 | 40 | 126 | 72 | 81 | 28 | 40 | 170 | 374 |
| Median | $790 | $948 | $97 | $178 | $388 | $620 | $472 | $619 | $2,580 | $774 | $465 | $553 |

# Appendix G

**Table G.1. VBA business activities by country**

| | Burkina Faso | Nigeria | Kenya | Tanzania | Mozambique | All |
|---|---|---|---|---|---|---|
| N | 62 | 74 | 76 | 107 | 95 | 414 |
| Food vending | 39% | 17% | 13% | 29% | 54% | 33% |
| Farm inputs supply | 3% | 49% | 34% | 45% | 20% | 31% |
| Farm outputs supply/aggregation | 14% | 25% | 37% | 18% | 18% | 22% |
| Livestock | 42% | 20% | 14% | 25% | 8% | 20% |
| Other | 13% | 9% | 23% | 3% | 29% | 16% |
| Providing farming advice | 3% | 41% | 6% | 25% | 3% | 15% |
| Animal feed | 0% | 26% | 12% | 24% | 6% | 14% |
| Processing of crops | 0% | 27% | 5% | 10% | 0% | 8% |
| Booking service provided | 3% | 17% | 0% | 7% | 5% | 6% |
| IT training | 0% | 20% | 3% | 0% | 2% | 4% |

# Appendix H

**Table H.1. Differences between young men and women VBAs in reporting the most important impacts of being a VBA**

| | Female Youth | Male Youth | P-value |
|---|---|---|---|
| ***Sample*** | *134* | *150* | |
| Increased knowledge of GAP | 27% | 28% | 0.895 |
| Higher income | **15%** | **28%** | **0.019** |
| Improved harvests | **33%** | **17%** | **0.002** |
| More trust/respect from my community | 4% | 7% | 0.355 |
| Other | 3% | 7% | 0.236 |
| Satisfaction from helping others | 7% | 7% | 0.86 |
| Starting/growing my business | 6% | 4% | 0.524 |
| Increased my confidence | 4% | 2% | 0.222 |

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