Partnership for Inclusive Agricultural Transformation in Africa, Final Evaluation

Volume I – Final Evaluation Report

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Preface

In 2016, a group of funders came together, aiming to achieve greater impact through collaboration and alignment than they could achieve alone. The common entry point among these funders was a commitment to AGRA, an African-led institution focused on establishing a pathway out of poverty for millions of African smallholder farmers. This initiative was formalized as the Partnership for Inclusive Agricultural Transformation in Africa (PIATA) and informed by a 2016 DAI evaluation of AGRA's work.

As the initial phase of the PIATA partnership drew towards completion in 2021, the Bill & Melinda Gates Foundation, working in collaboration with the other PIATA partners, funded an independent program evaluation. Through a competitive process, we chose Mathematica based on their deep experience in performing rigorous independent evaluations, the strength of their proposal, and a team that included significant African expertise. We, along with other PIATA partners, have encouraged and applauded AGRA's commitment to transparency by making the full evaluation public for the benefit of the greater development community.

The evaluation provides useful insights, not only to AGRA, but also to the broader community as we seek to evolve our own understanding of what is needed to drive agricultural transformation and support smallholders as they work to develop environmentally sustainable, equitable food systems that contribute to fighting poverty and malnutrition.

Bill & Melinda Gates Foundation February 15, 2022

signed on behalf of the PIATA partner Monitoring, Learning & Evaluation group, Bill & Melinda Gates Foundation, the Foreign, Commonwealth and Development Office, the Rockefeller Foundation, the United States Agency for International Development

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We are also grateful to Tabitha Nduku, Lilian Onyegbulam, and Kelvin Mulungu, our consultants, for their valuable insights and contributions to in-country data collection and synthesis. Zena Mpenda, Tadele Ergetw, and Anabela Mabota served as capable data collection leads in Ghana, Tanzania, Ethiopia, and Mozambique, respectively under the guidance of Tim Njagi.

Margo Berends coordinated remote primary-data collection, coded interviews, and analyzed quantitative data. Hailey Hannigan and Ksenia Miliutinskaia provided qualitative coding support, and Anu Rangarajan provided quality assurance. We also acknowledge valuable analytical contributions from Anthony D'Agostino, Evan Fantozzi, Dadi Fundira, Anthony Harris, and Esteban Quiñones.

Finally, we wish to thank AGRA leadership and technical staff for their engagement with the evaluation and assistance with data and interpretation. In particular, we owe a debt of gratitude to Fadel Ndiame and Simiyu Gaitano for their time and leadership.

The Bill & Melinda Gates Foundation funded this study.

Conflicts of Interest

The Tegemeo Institute of Agricultural Policy and Development is an occasional partner and competitor of AGRA in policy reform work. Tegemeo representatives did not participate in any analysis related to policy and state capability under this evaluation.

Contents

Exhibits

Acronyms

AGRA	Alliance for a Green Revolution in Africa
AGRF	Africa Green Revolution Forum
CAADP	Comprehensive Africa Agriculture Development Programme
DFI	Development Finance Institution
GHG	Greenhouse Gas
LSMS–ISA	Living Standards Measurement Study-Integrated Surveys on Agriculture
M&E	Monitoring and Evaluation
MLE	Monitoring, Learning and Evaluation
MSMEs	Micro-, small-, and medium-sized enterprises
NAIP	National Agriculture Investment Plan
PFJ	Planting for Food and Jobs
PIATA	Partnership for Inclusive Agricultural Transformation in Africa
PID	Program Innovations and Delivery
SHF	Smallholder Farmer
SMEs	Small- and Medium-sized Enterprises
ToC	Theory of Change
USAID	United States Agency for International Development
UN	United Nations
VBA	Village-Based Advisor

Executive Summary

Since its launch in 2006, Alliance for a Green Revolution in Africa (AGRA) has worked to enhance smallholder African farmers' productivity and prosperity. In 2017, AGRA launched a new five-year strategy called Partnership for Inclusive Agricultural Transformation in Africa (PIATA), which targets three thematic areas: (1) policy and state capability to strengthen government capacity and accountability and the policy environment; (2) systems development to build and expand integrated delivery systems; and (3) partnerships to facilitate alignment between government priorities and private-sector interests. Ultimately, PIATA aims to transform the agriculture sector into a driver of inclusive economic growth and to increase incomes and improve food security for 30 million farming households across 11 focus countries by 2021.

The PIATA resource partners are the Bill & Melinda Gates Foundation; the United Kingdom's Foreign, Commonwealth, and Development Office; the Rockefeller Foundation; the United States Agency for International Development (USAID); and the German Federal Ministry for Economic Cooperation and Development (abbreviated as BMZ). As this strategy draws to a close, the resource partners asked Mathematica to conduct a final evaluation of PIATA as implemented by AGRA. The evaluation approach, findings, and strategic recommendations are presented below.

Evaluation approach

We used contribution analysis as our analytical approach to determine the relative contribution of PIATA to observed changes in expected outcomes for institutions, markets, and farmers. First, we developed an evaluable theory of change (ToC) for PIATA, working closely with AGRA stakeholders. Next, we gathered data on program implementation and outcomes along the ToC from multiple data sources: AGRA's program documents and data, including their 2020 farmer outcome survey and 2020/2021 stakeholder phone surveys (called Geopoll); over 50 semi-structured interviews with stakeholders across 11 countries; and 318 structured web surveys of AGRA grantees and non-grantees. Then we collected additional qualitative data to explore four of AGRA's key models: *village-based advisors* (VBAs), trusted lead farmers that provide smallholders with extension and market linkages; *consortia* that mobilize public and private partners to improve market systems and serve farmers in a designated geography; *flagships* that implement the government's key priorities through bankable agriculture projects; and *private sector partnerships for last mile delivery*. These "deep dive" data collection efforts included 12 focus group discussions with farmers and nearly 100 interviews with VBAs, public officials, private sector representatives, and implementers from Ethiopia, Ghana, Kenya, Mozambique, and Tanzania.

To assess PIATA's impact on farmers, we conducted three types of quantitative analysis. First, where time series data on outcomes were available, we assessed the impact of PIATA's national-level interventions using an interrupted time series approach. Second, we used a dynamic difference-in-differences design applied to subnational time series to evaluate the impact of PIATA's farmer-facing interventions in the areas targeted. We conducted this analysis using Ministry of Agriculture data from Ghana, Kenya, and Ethiopia, as well as multiple waves of the Tanzania Living Standards Measurement Survey–Integrated Surveys on Agriculture (LSMS–ISA). This allowed us to compare outcomes over time between specific areas targeted for AGRA's farmer-facing activities with comparable areas that would have only benefited from its national-level effort. Third, we used a matched-comparison design to evaluate the impact of PIATA's farmer-facing interventions on PIATA-targeted farmers in Burkina Faso, Ghana, and Nigeria using the latest round of AGRA's farmer outcome survey, which collected rich data on farmer-level characteristics and outcomes from targeted and comparison farmers in the same areas.

Drawing on all program data, qualitative data, and quantitative analysis, we drafted complex multi-source "contribution narratives" that describe PIATA's contribution to any observed outcomes in each of AGRA's thematic areas relative to other external factors. To compose the narratives, we first sorted all qualitative and quantitative analyses and discrete pieces of evidence—such as interview passages and impact estimates—into their corresponding steps in the ToC. Next, we determined the independence and credibility of each analysis and piece of evidence. We then assigned color codes to the evidence at each causal step along the ToCs and against causal link assumptions, indicating the strength of the evidence: green for positive evidence of desirable change, yellow for mixed evidence, red for evidence that change did not occur, and blue if there were insufficient data on desired change.

Evaluation findings by question

What has been the overall impact of the PIATA program?

PIATA was successful in developing key policy reforms, mobilizing flagships and partnerships, and reaching farmers with extension and seeds. In several countries, PIATA's policy reform work helped incentivize private sector engagement in the production and delivery of improved seeds. PIATA also stewarded flagships from design to full execution in Ghana and Burkina Faso, effectively leveraging public and donor investment. In these ways, AGRA fulfilled its intended role of catalyzing agricultural development through improved policies and increased investment. Building upon this policy and state capability work, PIATA was successful in increasing the supply of certified seeds through direct support to seed companies and enhanced linkages between input actors. PIATA's large investment in VBAs was also successful in boosting farmers' access to basic extension services across several countries.

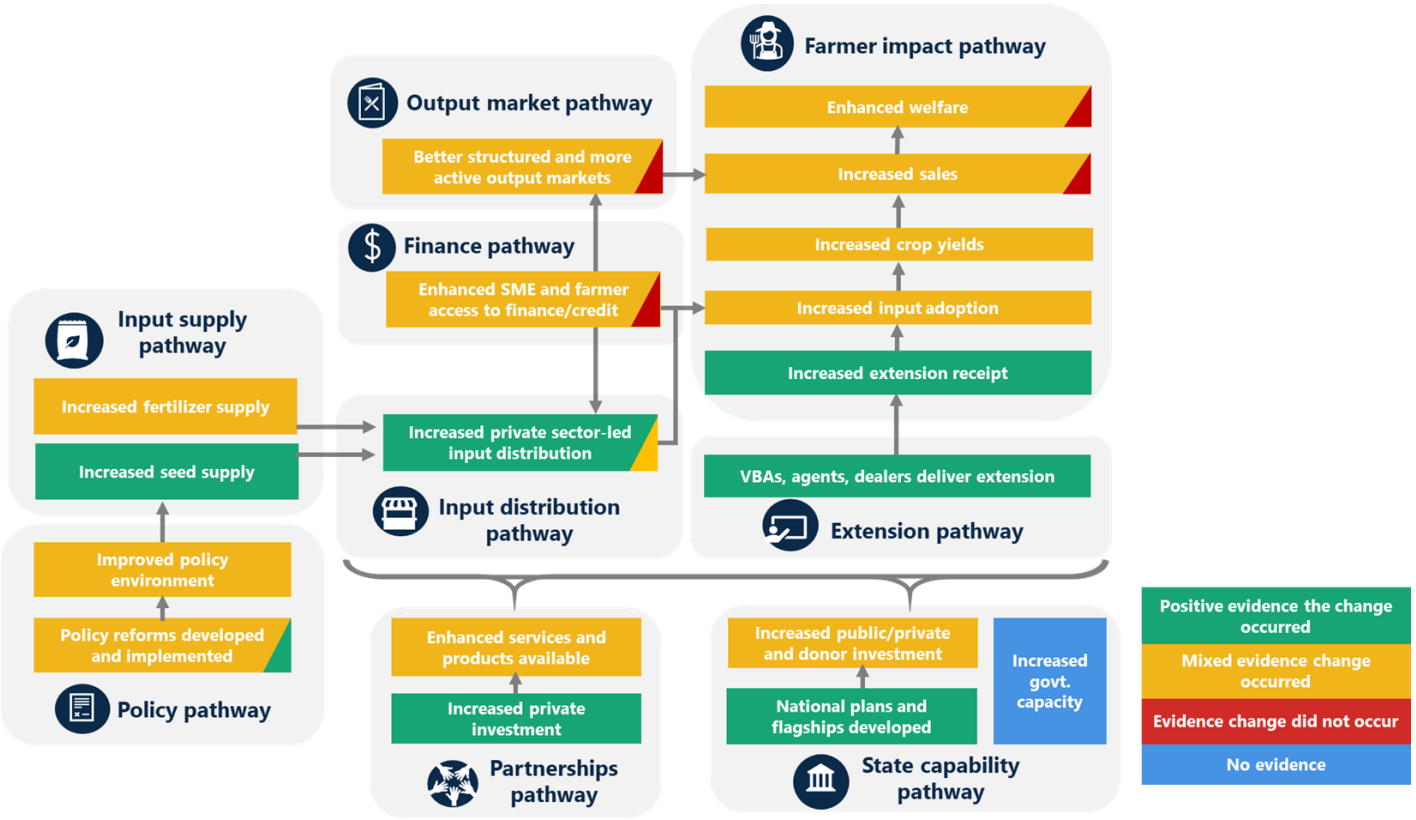
PIATA's impact on inclusive finance, output markets, and farmer outcomes was mixed. Nearly all market actors—including seed companies, agro-dealers, buyers, and farmers—reported acute credit constraints in interviews and surveys, despite PIATA's investments in inclusive finance. PIATA also had limited success stimulating output markets across focus countries, despite some notable achievements in a subset of countries and consortia. Rigorous analysis of household-level data from several countries suggests that PIATA increased farmers' access to extension. However, PIATA's impact on farmer-level outcomes—adoption of inputs, yields, sales, food security, and resilience—was mixed (Exhibit ES1). Notably, PIATA improved maize yields in Ethiopia, Ghana, and Nigeria, but not in Tanzania, Burkina Faso, or Kenya. Across these six countries, only farmers in Burkina Faso experienced improved maize sales as a result of PIATA. These mixed results likely reflect remaining farmer constraints in access to affordable inputs and output markets, as well as low per-farmer investment levels. These findings suggest that AGRA did not meet its headline goal of increased incomes and food security for 9 million smallholders, despite reaching over 10 million smallholders through its systems development work.

Is there evidence that AGRA's work on policy has changed how policies are developed and executed in target countries?

AGRA was successful in accelerating policy reforms, although it did not prioritize building policy making capacity. AGRA was successful in stewarding agriculture reforms through development and enactment, largely through consultants and seconded staff who helped public officials develop, enact, and implement modern and inclusive agriculture policies. Some AGRA-supported reforms had an outsized role in improving the policy environment and stimulating private investment, particularly seed system reforms in Rwanda, Ghana, and Nigeria. However, AGRA did not prioritize building public capacity for policy analysis and convening. With respect to sustainability, evidence suggests that governments are increasing their demand for policy reforms; however, strong reliance on AGRA support to deliver timely

policy reform has left public authorities with few incentives to build in-house capacity for policy analysis and enactment.

Exhibit ES1. Summary evaluation findings along AGRA theory of change



Note: Color accents signify outcomes for which evidence trends in a particular direction. For example, the color scheme for "Policy reforms developed and implemented" signifies that the full set of evidence of this outcome was generally mixed—and hence the outcome box is colored gold. However, there was more positive evidence of AGRA-influenced change (green) than evidence that change did not occur (red), resulting in the green accent on the right-hand corner of the box.

How has AGRA's support for building state capability affected governments' ability to plan, coordinate, and drive investment?

Governments have made some advances in developing National Agriculture Implementation Plans (NAIPs) and coordinating flagships alongside AGRA, yet they lack basic technical and managerial capacity. AGRA consultants and staff designed flagships, convened stakeholders to support them, and even directly executed flagships in Ghana. Where flagships were successfully implemented, government buy-in and ownership of flagships were strong, due in large part to authorities' central role in setting the vision for these programs. There is some suggestive evidence that AGRA's direct technical and financial support has enabled governments to plan and implement investment programs on their own, particularly in the case of flagships in Ghana and Burkina Faso. But there are no strong signs of increased capacity among ministry staff to plan and implement agriculture programs across AGRA's larger set of focus countries. Similar to AGRA's policy work, AGRA's 'results-oriented' approach of direct intervention in flagship design and execution has short-term payoffs in the form of active programs and delivered

services. However, this evaluation found no evidence that governments would continue to design and execute the next generation of agriculture flagships without AGRA support.

How successful has AGRA been in engaging the private sector as a partner?

AGRA has been successful in forging private sector partnerships and engagements. Since 2017, AGRA has partnered with over 100 organizations and has made 40 grants in a diverse set of investments. Most of these partners are private off-takers and input providers based in Africa. However, global technology partners, African financial institutions, multinational corporations based in Europe and the U.S., and large donors are also represented. Partnerships focus on last-mile delivery, mechanization, inclusive finance, regional trade, COVID-19 mitigation, and gender-inclusive small- and medium-sized enterprise (SME) services, among other topics. In terms of investment, AGRA reports that it has leveraged $141 million in investment from the private sector, surpassing its target of $100 million. This is an inherently difficult indicator to verify, given incentives for partners to over-report true leverage. However, stakeholders generally agreed that AGRA was successful in leveraging private sector investment.

To what extent have AGRA partnerships supported scaling business models toward increased investments and toward improving productivity of smallholder farmers?

AGRA has helped develop and scale profitable mechanization models, but unclear pathways to profitability remain for several other business models. AGRA's tractor purchase and mechanization service model has demonstrated strong financial viability across three countries. This success has generated investment from commercial banks and private players interested in scaling the model. However, the profitability of the majority of AGRA-supported business models is still unclear, and preliminary results are mixed. For example, a few digital financial and e-verification service models—such as e-Hakiki, AMTECH, and Success for People—have demonstrated strong potential for break-even, whereas digital extension for smallholder farmers and digital platforms for women-owned businesses have yet to establish viable business models. It is premature to assess the profitability of AGRA's full set of partnerships after four years, as five to seven years to break-even is a conventional benchmark.

In AGRA's areas of operation, how effective has AGRA been in driving integrated approaches to systems development?

Overall, AGRA had widespread success strengthening extension services and input markets, but less success in output and finance markets. Stakeholder discussions, AGRA surveys, and our structured web survey suggest that large AGRA investments in VBAs and extension systems increased farmers' access to extension in consortium target areas. Similarly, AGRA-funded support for seed companies and agro-dealers in consortia areas helped these SMEs strengthen their input linkages and leverage VBAs to meet growing demand. AGRA also had success strengthening output and finance markets within and alongside consortia, but in a smaller subset of countries and regions. Across all countries, stakeholders generally noted that AGRA-funded improvements in extension and input markets reached more farmers than improvements in output markets and finance. This likely reflects AGRA's well-established expertise and relationships in seed systems and input markets (relative to output markets) as well as the lack of strong overlap between farmers targeted by AGRA's inclusive finance initiatives on one hand, and consortia on the other.

Strategic recommendations

Based on the evaluation findings, we have the following strategic recommendations for the next phase of PIATA's work.

More fully leverage synergies and relationships to meet farmers' binding constraints. PIATA's mixed results on farmer yields and sales suggest that AGRA is addressing some, but not all farmers' binding constraints to agricultural transformation. Of these constraints, affordable inputs (through credit arrangements) and output markets are perhaps the most difficult to unlock. AGRA and partners could increase its potential for farmer impact by more robustly assessing farmer and SME constraints at the outset in target geographies and commodities, and formulating tailored interventions to address them. Given AGRA's catalytic and synergistic approach, these tailored interventions will likely require stronger integration of financial institutions, (hub) agro-dealers, and buyers into consortia from the outset, and even tighter integration between AGRA's policy and systems development teams in each focus country. Given current extension rates of less than 50 percent in most focus countries, AGRA should also seek to leverage government systems and other donors to boost extension access throughout consortia. Increasing extension efforts and leveraging public and private funding could help meet minimum thresholds of per-farmer investment that likely produced productivity gains seen in Ethiopia, Nigeria, and Ghana.

Develop a sustainability, scaling, and exit strategy for all key areas of work. The success of AGRA's VBA, consortia, and partnership work depends on its ability to identify, develop, and implement approaches that make it profitable for market system actors to engage smallholder farmers without external support. Our findings suggest that private sector partners and VBAs do not always find profitable models to engage with farmers. (This is to be expected given the inherent challenge of agricultural transformation.) We recommend that AGRA teams regularly assess their active partnership and consortia portfolios, and identify those activities that are unlikely to be profitable once initial funding is exhausted. Where profitability has not emerged and public funding may be necessary, AGRA can attempt to galvanize public or donor support before project close-out. Where private-led approaches do not reach break-even or public funding is not secured by a defined deadline, AGRA should exit those programs to conserve scarce resources.

More deeply engage with and empower civil society and smallholders. Building upon its commendable stakeholder consultation work in Phase 2, AGRA should engage with civil society and smallholders more deeply and even earlier in the policymaking and flagship development process. This higher level of civil society engagement in formative discussion could increase ownership of development programs and feasibly lead to greater public investment in crop diversification, better nutritional outcomes, and increased farmer capacity for entrepreneurial and welfare-maximizing activity. In addition, supporting the capacity of civil society and farmer groups to organize and speak with one voice—outside of specific policy reforms—could bolster their ability to lobby governments for more inclusive reforms in a credible manner.

Consider targeted capacity-building efforts while staying the course with results-oriented policy reforms. AGRA has shown technical expertise in delivering high quality and credible technical and financial support to accelerate policy reform processes. AGRA staff have also built strong relationships with governments and earned the trust of government partners in policy reform development and implementation. AGRA should leverage this expertise and credibility to continue its current 'results-oriented' focus on immediate reforms in focus countries—targeting those reforms that feature the strongest synergies with AGRA's systems development work. To complement this results-oriented work,

AGRA should enhance longer-term public capacity in policy development in a smaller set of countries with favorable conditions for retaining this capacity, including relatively apolitical agriculture ministries with permanent financial resources and low staff turnover. Capacity building in these countries could feature structured training and coaching supports, as well international learning exchanges.

Develop criteria to identify and prioritize flagships that have potential for agricultural transformation. AGRA largely follows countries' vision for flagships, even to the point of upholding inconsistent principles across countries. For example, AGRA supported flagships that involved highly targeted subsidies through the Planting for Food and Jobs flagship in Ghana, but it supported flagships that involved less targeted (and thus less distortionary) e-vouchers for seed and fertilizer in Kenya. To reduce these inconsistencies across countries and reinforce its own vision of agricultural transformation, we suggest that AGRA develop clear criteria to assess, prioritize, and influence flagships across countries. This could include general criteria related to flagships' concrete alignment with the nine articles of the Malabo Declaration, as well as topic-specific criteria (such as the efficiency of proposed input subsidies). Developing these criteria could enable AGRA to more critically assess government-proposed flagships and suggest changes that can make flagships even more transformative.

Become a more learning-focused organization with less burdensome grantee reporting and more rigorous farmer surveys. AGRA should consider convening its leadership, technical, and M&E staff to set a focused learning agenda grounded in its major evidence and decision-making needs for the next strategy. A more focused agenda could help determine changes in farmer outcome survey fielding, sampling, and timing that would be needed to more rigorously measure AGRA's farmer impact. A more focused agenda could also help streamline grantee reporting requirements to a minimal set of indicators.

Tackle critical issues facing agriculture in sub-Saharan Africa. AGRA already promotes climate-smart and drought-resistant crop varieties, which is highly commendable. However, its systems development work does not appear to fully account for farmers' poor access to irrigation and growing exposure to drought and other severe weather conditions. AGRA's next strategy should articulate these acute challenges and make more explicit investments in improving farmers' water use efficiency and climate resiliency. AGRA's next strategy could also formally recognize that agricultural technologies and practices—such as fertilizer use and rice cultivation—can negatively impact environmental conditions and greenhouse gas (GHG) emissions. In contrast, other agricultural technologies can help to reduce GHG emissions and store carbon. Cognizant of these linkages, AGRA could make more explicit investments in eco-friendly technologies and practices among smallholders. As it develops the next set of country strategies, AGRA could also assess the environmental impact of its fertilizer recommendations, as well as the alignment of its full set of proposed investments with national pathways to net zero.

Expand gender and youth inclusion efforts. Only a small portion of AGRA's portfolio features intentional diversity, equity, and inclusion programming. To remedy this, AGRA should strive to infuse its systems development and state capability work with upfront assessments of women's and youth's constraints, active engagement with women and youth about potential solutions, and tailored supports for women and youth when feasible. AGRA should also bolster the nascent initiatives and platforms serving women and youth, such as VALUE4HER and Deal room, with strong emphasis on building viable in-country business models and sustainability plans.

1. Introduction

The Partnership for Inclusive Agricultural Transformation in Africa (PIATA), launched in 2017, aims to catalyze country-led inclusive agricultural transformation by increasing smallholders' productivity, strengthening output markets, enhancing the agricultural sector's resilience to shocks and stresses, and improving coordination and accountability. Through its implementing partner, the Alliance for a Green Revolution in Africa (AGRA), PIATA seeks to transform agriculture from a source of subsistence into a driver of inclusive economic growth. PIATA, as implemented by AGRA, set an ambitious goal of increased incomes and improved food security for 30 million farmers across 11 focus countries by 2021. This includes increasing incomes and food security for 9 million farmers through direct assistance and increasing incomes and food security of an additional 21 million indirectly through strengthened public and private sector capacities.

AGRA defines agricultural transformation as a process by which individual farms shift from diversified, subsistence production to more specialized, market-oriented production. This requires greater reliance on input and output delivery systems and increased integration of agriculture with other sectors of domestic and international economies (AGRA 2017). To execute this vision, PIATA selected 11 focus countries based on AGRA's existing in-country assets, partner governments' commitment to agriculture, and potential for impact. Of these, AGRA is working directly in seven "push" countries that have relatively nascent agricultural systems: Burkina Faso, Ethiopia, Ghana, Nigeria, Mali, Mozambique, and Tanzania. In these push countries, AGRA focuses on building systems to drive transformation by improving farmers' access to seeds, fertilizer, and extension. In four "pull" countries—Kenya, Malawi, Rwanda, and Uganda—AGRA focuses its efforts on "pulling" production towards output markets through assistance to small- and medium-sized enterprises (SMEs) and improved access to finance. Other countries with "light-touch" AGRA investments are South Sudan, Togo, Zambia, and Côte d'Ivoire, which we do not consider for this evaluation.

PIATA organizes its work under three thematic areas that also entail cross-cutting emphases on gender, youth, resilience, and capacity building. Across all three thematic areas, AGRA gave over $113 million in grants to over 500 organizations in 11 focus countries. Grant funding was largely devoted to systems development, both within and alongside consortia. AGRA leadership and technical staff in Nairobi and country staff in each focus country also devoted a significant portion of their time to all thematic areas. AGRA staff conducted formative analyses and outreach, developed country plans, and convened stakeholders, among other activities. AGRA's key activities in the three thematic areas are described below.

Policy and State Capability. Through technical and financial assistance, as well as stakeholder convening efforts, AGRA staff support key agriculture policy reforms. The reforms are designed to promote transparent and fair "rules of the game," thus boosting private investment and regional trade. AGRA defines state capability as public capacity to (1) set the vision for agricultural transformation, (2) convene and coordinate stakeholders, (3) implement agriculture programs and deliver services, and (4) strengthen monitoring and evaluation (M&E) and mutual accountability systems, among other dimensions (AGRA Emerging Results: 2017–2020). Under its state capability area, PIATA works to strengthen these four dimensions of public capacity among its 11 focus countries. Through consultancies as well as stakeholder coordinating efforts, AGRA supports national agriculture investment plans (NAIPs) and large-scale, bankable agriculture programs called flagships. In some countries, AGRA also supports M&E planning for agriculture programs and direct implementation of flagships. Total grant funding for AGRA's policy and state capability work from

2017 to 2021 was $26.2 million. Jointly with AGRA's partnerships work, its policy and state capability investments were intended to indirectly reach 21 million smallholders across AGRA's 11 focus countries.

Partnerships. Under the partnerships thematic area, PIATA facilitates alignment between government priorities and private-sector interests to serve smallholder farmers and agribusiness SMEs. Through grants and institutional partnerships, AGRA's partnerships team seeks to identify, refine, and scale digital services, mechanization, and last-mile delivery solutions for smallholders. AGRA also hosts the Agribusiness Deal Room on annual basis. The Deal Room is an in-person and virtual platform that matches investors with public and private actors seeking capital for agriculture endeavors across sub-Saharan Africa. Total grant funding for AGRA's partnerships work from 2017 to 2021 was $2.8 million. However, most of AGRA's partnerships do not involve direct AGRA grant funding, relying instead on partner funding and sponsorships.

Systems Development. Within systems development, AGRA invests in input supply and distribution, input and output markets, extension, and inclusive finance—at both national and regional levels. AGRA's two central models within systems development are consortia and village-based advisors (VBAs). Consortia include groups of specialized agriculture actors, including seed and fertilizer suppliers, extension agents, agro-dealers, NGOs, and—more recently—finance institutions who agree to work together to improve agricultural systems within a defined geography. These actors would provide integrated delivery of services, technologies, and knowledge to farmers and SMEs that serve them, thus addressing actors' binding constraints to growth. Often deployed within the context of consortia, VBAs are self-employed community leaders who provide farmers in their vicinity with training on good agricultural practices (GAP) and improved seeds and fertilizer, often through use of demonstration plots and free seed packs. Besides providing extension, VBAs are expected to sell farmers improved inputs and play a role in output aggregation, thus earning much-needed income through commissions. Total grant funding for AGRA's systems development work from 2017 to 2021 was $84.5 million, or around $10 per smallholder given AGRA's target of 9 million smallholders benefited through direct assistance.

Although these three thematic areas have distinct objectives and workstreams, they are all designed to catalyze large-scale public, private, and donor investment toward agricultural transformation. The catalytic nature of AGRA's work is vital, given the $23 to $31 billion annual gap in agriculture funding required for agricultural transformation (AGRA Strategic Partnerships presentation, 2021). The importance of catalyzing additional resources is particularly salient when considering AGRA's per-farmer investment of $10 through its systems development work. These limited resources call AGRA to work effectively at a system level to mitigate market failures, unlock large sums of public and private investment, and enhance public extension systems.

In this report, we evaluate AGRA's contribution to system-level outcomes of agricultural investment and market integration, in addition to farmer outcomes through PIATA. (In the remainder of the report, the term "PIATA" refers to PIATA-funded activities delivered by AGRA). Ultimately, the evaluation serves to achieve three broad objectives. The three objectives are:

To assess AGRA's overarching accomplishments during this second phase of PIATA (2017–2021).

To increase transparency and contribute to public discourse regarding AGRA's role in agricultural transformation across the continent.

To inform decision making regarding a potential next phase of partnership and tranche of funding.

PIATA resource partners posed several evaluation questions to meet these objectives, organized by thematic areas and sub-areas. At a high level, the questions interrogate PIATA's success in altering market systems, public institutions, and farmer outcomes since 2017, as well as the sustainability of PIATA's Phase 2 investments. (see Volume II, Appendix A for the full set of evaluation questions). Section 1 briefly presents the evaluation approach used to answer these evaluation questions. Section 2 presents the evaluation findings, organized by thematic area. Section 3 presents the strategic recommendations based on the evaluation findings.

2. Evaluation Approach

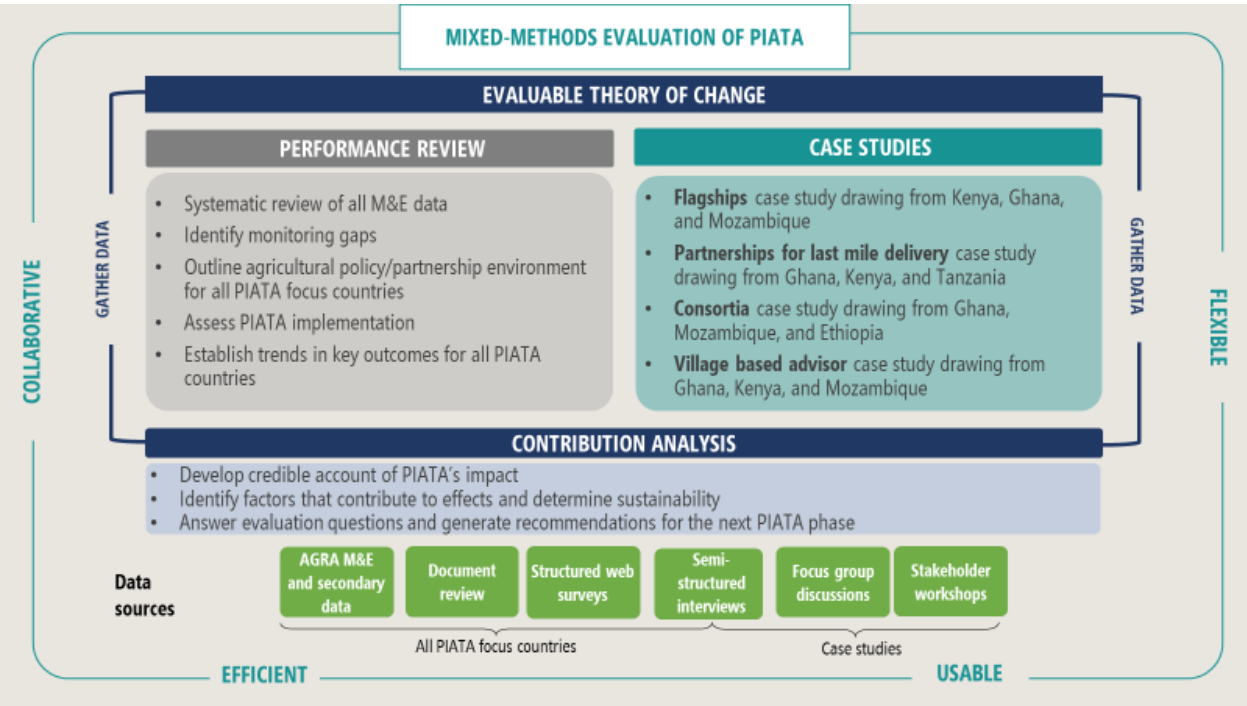
Overview

We used contribution analysis to assess how and to what extent PIATA's activities contributed to shifts in key outcomes from 2017 to the present. First, we co-created an overarching evaluable theory of change (ToC) for PIATA's full portfolio, as well as more detailed (or "nested") ToCs for AGRA's work in policy and advocacy, state capability, partnerships, input supply, input distribution, extension, inclusive finance, consortia, and farmer outcomes (see Volume II, Appendix B for the full evaluable ToC upon which all nested ToCs are based). Next, we gathered evidence on AGRA's implementation and progress toward outcomes along the ToCs, drawing on survey data, AGRA monitoring data and surveys, our own structured web survey, and key stakeholder interviews from all focus countries (see Volume II, Appendix C and D for more details on the web survey and qualitative data collection efforts, respectively).

Then we conducted additional qualitative data collection to explore four of AGRA's key models: VBAs, consortia, flagships and private sector partnerships for last mile delivery. These 'deep dive' data collection efforts included 12 focus group discussions with farmers and nearly 100 interviews with VBAs, public officials, SME representatives, and implementers from Ethiopia, Ghana, Kenya, Mozambique, and Tanzania.

Leveraging all quantitative and qualitative sources, we developed contribution narratives that describe PIATA's contribution to these outcomes, across PIATA and within the thematic areas. Throughout data collection, we assessed PIATA's strategy on empowering women and youth, how it was implemented, and how it may have influenced these populations' outcomes.

Exhibit 1. Evaluation approach



Jointly, the performance review, case studies, and contribution analysis answered all the evaluation questions posed by PIATA partners.

Exhibit 2 presents the data sources we employed in addressing the seven overarching evaluation questions.

Exhibit 2. Evaluation approach and data sources, by research question

Domain	Evaluation question	Key data sources
Policy and State Capability	**1.** How has AGRA's support affected government's ability to plan, coordinate, and drive investment? **2.** Has AGRA's work on policy changed how policies are developed and executed in target countries?	• Reports and monitoring data • 159 semi-structured interviews with AGRA staff, public officials, outside experts, and civil society representatives • Structured web survey with 51 AGRA direct partners and knowledgeable stakeholders
Partnerships	**3.** How successful has AGRA been in engaging the private sector as a partner?	• Reports and monitoring data • Semi-structured interviews with AGRA, private partners, and donors • Structured web survey with 49 AGRA direct partners and knowledgeable stakeholders

Domain	Evaluation question	Key data sources
Systems Development	**4.** How effective has AGRA been in driving integrated approaches to systems development? **5.** What outcomes has AGRA's extension approach created or contributed to? **6.** What outcomes has AGRA's seeds systems approach created or contributed to?	• Reports and monitoring data • AGRA Wave 1 and 2 Geopoll telephone survey • Interviews with consortia members, agro-dealers, seed company staff, and buyers • 25 focus group discussions with farmers and VBAs • Structured web survey with 161 AGRA direct partners and knowledgeable stakeholders
Farmer outcomes	**7.** How has PIATA contributed to farmer productivity, food security, and income across the 11 focus countries?	• LSMS-ISA Tanzania; AGRA farmer outcome surveys in Burkina Faso, Ghana, and Nigeria. • Semi-structured interviews with AGRA staff, donors, and outside experts

Notes: See Volume II, Appendix A for the full set of evaluation questions and their corresponding data sources

Qualitative analysis

For all interviews and focus groups, we conducted thematic coding of transcripts, triangulated accounts across stakeholder types, and distilled the findings into country-level narratives and nested ToCs, broadly organized around the key questions in our charge. We further distilled country-level narratives into portfolio-level qualitative findings. We also compared and contrasted the perspectives of AGRA staff, public and private actors, and farmers on the overarching value and effect of AGRA's direct and indirect support. Importantly, we synthesized farmer focus group transcripts to characterize their experience with VBAs and extension agents; their experience with improved seeds; and their self-reported production, sales, income, and household welfare. We also identified quotes that best distilled and communicated themes that commonly emerged among stakeholders.

Quantitative analysis

We conducted three types of quantitative analysis. First, for Ghana and Tanzania, where time series data on outcomes were available, we assessed the impact of PIATA's national-level interventions. Second, we evaluated the impact of PIATA's farmer-facing interventions in the areas targeted, using Living Standards Measurement Survey–Integrated Surveys on Agriculture (LSMS-ISA) survey data for Tanzania and Ministry of Agriculture data for Ghana, Ethiopia, and Kenya. Third, we evaluated the impact of PIATA's farmer-facing interventions on targeted farmers using AGRA's farmer outcome surveys in Burkina Faso, Ghana, and Nigeria. Below, we expand on these three approaches. (See Volume II, Appendix E for additional detail on the impact analysis methodology and findings.)

Assessing national-level agricultural performance. We used interrupted time series analyses to evaluate the extent to which the staggered rollout of AGRA's national-level initiatives and regionally targeted farmer-facing interventions was associated with changes in national-level agricultural performance. Interrupted time series analyses allowed us to formally test for changes in the "level" (discontinuous jumps) and "trend" (changes in slope) of historical time-series data on agricultural performance at key junctures associated with AGRA's work, namely, the launch of Phase 1 in 2008 and of Phase 2 in 2017. Our data consist of official national-level statistics from the Ministries of Agriculture in two countries: (1) annual maize and rice yield between 2000 and 2020 in Ghana; and (2) annual maize and rice production between 1985 and 2019 in Tanzania. A key assumption necessary to attribute any

observed impacts in these two countries to AGRA's package of interventions is that no other large-scale changes (such as domestic agricultural policy changes or international agricultural market fluctuation unrelated to AGRA's work) occurred in or around the years in which AGRA launched its country-level efforts. We interrogated this assumption through a series of hypothesis tests, whereby we assessed the potential influence of outside factors—such as input subsidy programs and droughts—on productivity and production at the national level.

Assessing subnational impact of farmer-facing interventions. To assess the incremental impact of AGRA's farmer-facing interventions, we relied on a dynamic difference-in-differences design applied to subnational time-series data (on crop productivity and, in certain cases, access to extension services and input use). These data allowed us to compare outcomes over time between specific areas (such as distinct districts, counties, or regions) targeted for AGRA's farmer-facing activities with comparable areas that would have only benefited from its national-level efforts. Our data cover Ghana, Kenya, and Ethiopia (obtained from the respective Ministries of Agriculture), as well as Tanzania (extracted from multiple waves of the LSMA–ISA). This approach enabled us to rigorously control for regional characteristics (such as agroecological conditions) that could drive variation in outcomes in ways unrelated to AGRA's work. Depending on the spatial precision of the data available to us, the difference -in-differences design also enabled us to precisely account for region-specific trends and shocks that would otherwise have made it challenging to evaluate impacts (such as a drought that affected only one part of the country). Two key assumptions were needed to attribute observed impacts to AGRA's work. First, areas targeted by AGRA's work had to be trending similarly before the launch of AGRA's initiatives. Wherever data are available, we provide evidence in support of this assumption. Second, no other large-scale policy change could overlap spatially and temporally with the launch of AGRA's farmer-facing activities (i.e., no other initiative that could affect agricultural outcomes targeted the areas AGRA targeted during the same period). We assessed this assumption by evaluating alternate hypotheses for such national-level changes.

Assessing impacts on farmers targeted by AGRA. To evaluate impacts on farmers who directly benefited from engagement with AGRA, we used a matched-comparison design applied to data from the latest round of AGRA's farmer outcome survey, which collected rich data on farmer-level characteristics and outcomes from targeted and comparison farmers located in the same areas. The matched-comparison approach leverages these farmer-level characteristics (such as age, education, and total landholdings) to select subsamples of targeted and non-targeted farmers who closely resemble each other. In so doing, it partially accounts for underlying differences that exist between groups of farmers when an intervention is delivered non-randomly, which can bias estimates of impact. Given data availability, our analyses cover the three countries—Burkina Faso, Ghana, and Nigeria—where data on household-level characteristics, farmer practices, and agricultural outcomes are available for both targeted and non-targeted farmers.[1] A key assumption needed to attribute observed impacts to AGRA's work is that the observable characteristics used to conduct farmer-level matching were the main drivers of farmers' engagement (or lack thereof) with AGRA. Given that targeted and comparison farmers were in the same areas, the risk of intra-regional spillovers associated with AGRA's work also exists; such spillovers could lead us to underestimate the true farmer-level impact of AGRA's efforts. However, we understand from AGRA that their farmer-facing interventions focused on targeted farmers, reducing the concern for intra-regional

[1] In related analyses, we used an endogenous-treatment regression model to evaluate the extent to which farmers who did use extension services and improved inputs experienced improved crop productivity and higher food security using AGRA's outcome data from all seven countries in which these surveys were conducted (see Appendix E). We found a significant impact of adoption of extension and improved inputs on food security and crop productivity.

spillovers. In fact, even among targeted farmers, AGRA-promoted interventions were adopted by less than half of the farmers.

Contribution analysis

We used contribution analysis to synthesize evidence on PIATA's impact along the evaluable ToCs. Drawing on all quantitative and qualitative data and findings, we drafted complex multi-source "contribution narratives" that describe PIATA's contribution to any observed outcomes in each of AGRA's thematic areas. To compose the narratives, we first sorted all qualitative and quantitative analyses and discrete pieces of evidence—such as interview passages and impact estimates—into their corresponding steps in the overarching and nested ToCs as well as against causal link assumptions in the ToC. Next, we assigned a level of credibility to each analysis and piece of evidence. For example, quantitative analyses with strong counterfactuals and detailed first-hand qualitative accounts were assigned a higher credibility rating than pre-post monitoring data and general second-hand qualitative accounts. With this completed, we settled upon a strength-of-evidence assessment for the full set of evidence at each step along the ToCs. We also used process tracing to ensure rigor and reduce bias in our analysis. Process tracing is a rigorous qualitative method that explores competing hypotheses reflecting different plausible explanations of the causes of a given outcome. Through this approach, we posed a logical sequence of tests (such as hoop tests and "smoking gun" tests) to assess the credibility and plausibility of the claim that AGRA program models have had a direct contribution to observed outcomes (Collier 2011; Punton and Welle 2015). By weaving together multiple data sources, including interviews with key market actors, we generated credible summaries on how and why PIATA's program models contributed to change, and the specific conditions in which they were successful.

We also used our structured web survey of over 315 respondents, conducted in mid-2021, to estimate AGRA's general contribution to its headline goals of an improved policy environment, increased private investment, and increased access to finance, among others. Contribution scores capture the extent to which PIATA stakeholders reported a positive trend in key agriculture outcomes since 2017 and attributed this positive trend to AGRA's work. Contribution scores in the 'small' range reflect a general sentiment that AGRA made a small contribution to positive change relative to other public and private actors and donors in the agriculture space. Scores in the 'moderate' range reflect the sentiment that AGRA contributed to positive change alongside other actors, and scores in the 'large' range reflect the sentiment that AGRA made a large contribution to positive change relative to other actors. Given the large set of public, private, and philanthropic actors working in agriculture policy and systems in sub-Saharan Africa (SSA), scores in the 'large' range are expected to be uncommon. (See Appendix C in Volume II for more detail on contribution scoring.)

3. Evaluation Findings

Below we present results by thematic area, followed by overarching findings that span thematic areas. Within each subsection, we first summarize AGRA' s activities and ultimate goals, using the nested ToCs as a guide. Next, we give an overarching assessment of AGRA's performance along the ToC, using color coding to indicate whether the evidence was largely positive, mixed, negative, or absent. We also present key findings for the primary and secondary evaluation questions—first for AGRA's policy reforms and state capability, and then for partnerships and systems development. We conclude with a discussion of farmer outcomes, which represent the effects of the full set of AGRA's investments in policy and state capability, partnerships, and systems. These findings draw from the more detailed contribution narratives developed within each thematic area. (Appendix F in Volume II provides the full contribution narratives).

Spanning 2017 to 2021, the time period for this evaluation overlaps with the COVID-19 pandemic. From early 2020 through 2021, the pandemic disrupted input supply chains, limited farmers' and clients' access to public marketplaces, and further limited public and private financing and credit options for smallholders. Although all countries in SSA were adversely affected by the pandemic, some were hit harder than others. For example, 2020 was a particularly poor year for agriculture in Mali, which experienced a 20 percent reduction in the area cultivated in corn due to fertilizer shortages. To the extent possible, the evaluation's impact findings account for the detrimental effects of the pandemic by comparing treatment and comparison group farmers who likely experienced the pandemic in similar ways, given their geographic proximity. However, impact estimates may still reflect systematic effects of the pandemic on population movement, productive activities, and market behavior.

Policy and State Capability

Although policy and state capability were one thematic area in PIATA's ToC, we examine AGRA's implementation separately for these two topics.

A. Policy

AGRA's work in policy reform began in 2013 with efforts to improve the enabling environment for agribusiness investment in five countries: Burkina Faso, Ethiopia, Ghana, Nigeria, and Tanzania. Leveraging this successful work, AGRA invested over $6 million in policy reforms from 2017 to 2021 in most focus countries, with particularly large investments in Kenya, Ghana, and Mozambique. Reforms focused on modernizing and streamlining policies on subsidies, input markets, output markets, and trade policy, with the overarching goal of stimulating private sector investment. To this end, AGRA provided financial and technical support—often in the form of consultants and seconded staff—to help public officials develop, enact, and implement modern and inclusive agriculture policies. To promote inclusive policymaking, AGRA also facilitated and incentivized non-state actors to participate in the policymaking process. As a result of these efforts, AGRA anticipated that stakeholders would increase their demand for policy reforms and public authorities would build capacity to develop and implement reforms, thereby creating an improved policy environment for private sector investment in agriculture.

Evaluation questions

To assess AGRA's contribution to policy reforms, government capacity for policymaking, and the policy environment for agricultural transformation, we answer several evaluation questions along the ToC (see Exhibit 3).

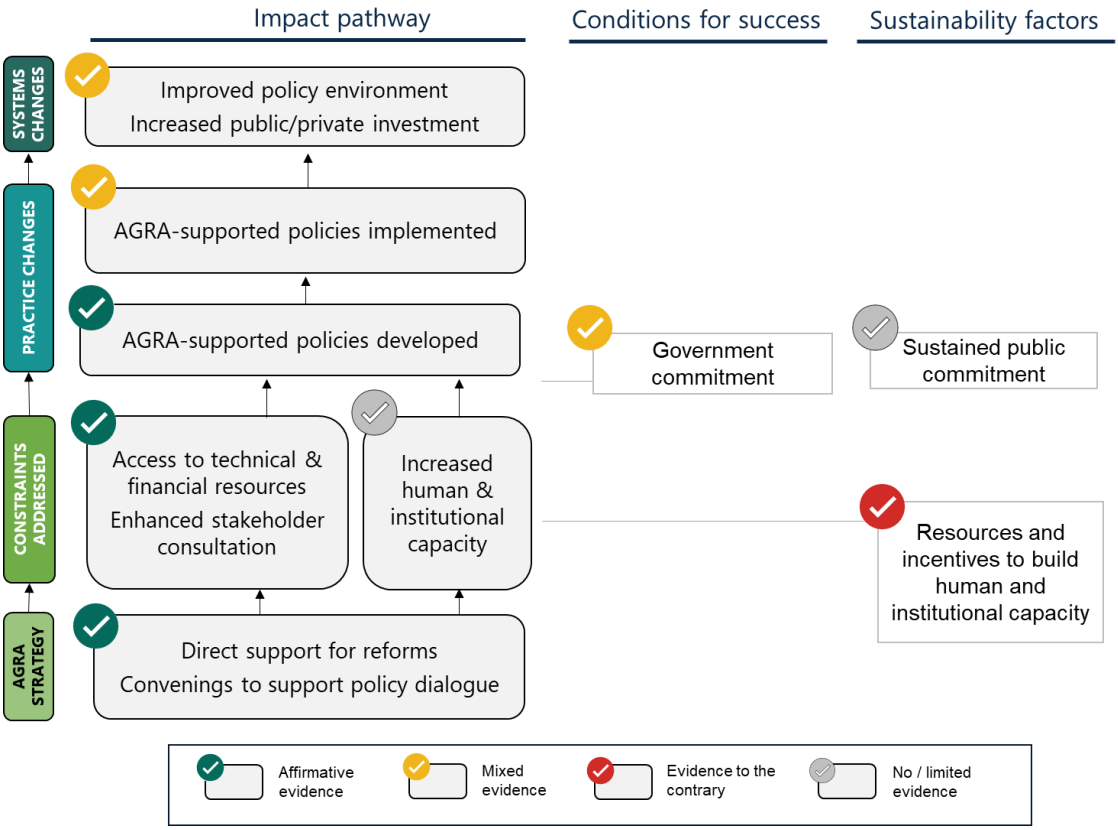
Exhibit 2. Evaluation questions on AGRA's policy work

Primary question:
• Is there evidence that AGRA's work on policy has changed how policies are developed and executed in target countries?
Secondary questions:
• How successful was AGRA in partnering and collaborating with other actors in creating a conducive policy environment? • To what extent has AGRA helped to strengthen government capacity to effectively develop, pass, and implement policies? • What evidence is there that suggests outcomes are sustainable beyond the life of the intervention?

Key evaluation findings

AGRA was successful in accelerating policy reforms and increasing stakeholder participation in policymaking. AGRA provided ministries of agriculture with a range of financial and technical support to further the policy reform process, including (1) financial support to conduct policy research and convene stakeholders, (2) consultants and seconded staff to support reform processes, (3) convening activities to increase non-state actors' participation in the policy reform process, and (4) grants to build information systems to serve analysis and advocacy. Through this support, AGRA helped initiate 72 agriculture policy reforms across the 11 target countries in the areas of seed, fertilizer, and output market access, among others (AGRA Program Performance Report Q4, 2020). This high volume of reforms initiated in five years represents strong performance against AGRA's initial target of 55 reforms. However, 33 of the 72 reforms were not implemented by 2021, likely due to resource constraints, COVID-19 delays, and multi-year timelines commonly associated with policy reform. Stakeholders noted multiple actors were involved in policy reform processes, including several ministries and agencies as well as the World Bank, IFAD, and USAID, among other donors. Although these other actors played a role in policy reforms, stakeholders mentioned that AGRA's support was the most catalytic, given their strong connections to government and convening power, particularly with the private sector. In interviews, civil society representatives also reported increased participation in the policy reform process as a result of AGRA's inclusion efforts, even if their participation came late in the formulation process (Exhibit 4).

Exhibit 3. Evaluation findings along the policy ToC

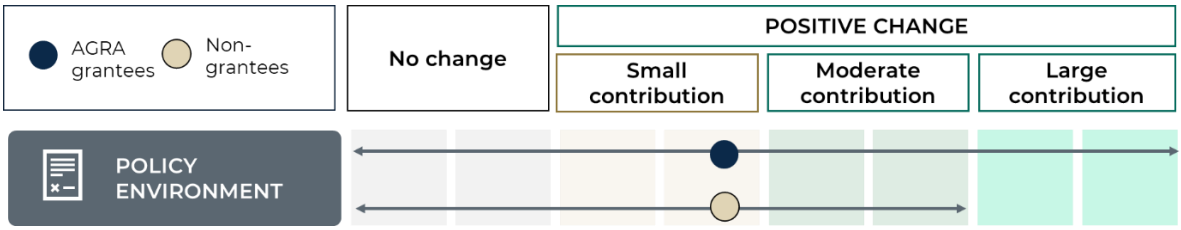


AGRA-supported reforms in finance, aflatoxin, and seed production may have the most potential to impact SMEs and farmers. Although AGRA supported over 70 policy reforms, some of these policies are more likely to have a high impact on farmers and the private sector relative to others. AGRA's work on agriculture finance policy reform in Burkina Faso and Kenya may have an outsized impact on SMEs, given the high historic risks and costs of agriculture finance in the region. Similarly, AGRA's work on policy reforms related to aflatoxin mitigation in Ghana and other countries have the potential to reduce mortality and contribute to large benefits in terms of health and well-being for smallholders and consumers. Lastly, AGRA's work in seed and fertilizer policy reforms in Rwanda, Ethiopia, Ghana, Nigeria, and other countries could incentivize SMEs and stimulate farmers' access to improved inputs, provided reforms are well implemented.

According to stakeholders, AGRA's policy work was effective, but its contribution to the agriculture policy environment was small. Over 85 percent of respondents to a structured web survey reported that the policy environment for agriculture had improved over the past four years, likely reflecting the combined effect of various efforts from national governments, multilateral institutions, and donors to stimulate private investment in agriculture through generalized and targeted policy reforms. However, respondents assigned AGRA a small contribution to these changes (Exhibit 5). This is somewhat surprising, given stakeholder accounts of the catalytic role AGRA played in fast-tracking policy reforms. This relatively low contribution may reflect the fact that nearly half of AGRA-supported reforms had not yet been implemented by the end of Phase 2. However, some AGRA-supported reforms

had an outsized role in improving the policy environment and stimulating private investment, particularly seed system reforms in Rwanda and Ethiopia.

Exhibit 5. AGRA's contribution to the agriculture policy environment, 2017–2021



Source: 2021 Structured web survey; N = 51 AGRA direct partners and knowledgeable stakeholders

AGRA's success with policy reform has incentivized governments to request more AGRA support, rather than build capacity. In interviews across all 11 countries, government counterparts reported no plans to replicate AGRA's reform processes or realign their internal financial and human resources to change their overall approach to policy reform as a result of AGRA's support. Instead, governments have increased their demand for AGRA's continued policy support, particularly highly qualified consultants and stakeholder convening efforts financed by AGRA. In part, this is a testament to AGRA's success in fast-tracking policy reforms in focus countries, as well as public authorities' limited financial and human resources. However, as long as AGRA-financed consultants and seconded staff are available, governments are unlikely to build capacity in analysis, stakeholder consultation, and policy enactment and execution in future years.

B. State capability

With $10 million in funding, AGRA supported NAIPs, flagships, and Comprehensive Africa Agriculture Development Programme (CAADP) reporting across all 11 focus countries, with a particularly large investment in state capability development in Burkina Faso ($3.9 million). AGRA funded consultants and provided direct technical assistance to design and support NAIPs, results-based monitoring, and flagships. AGRA also funded meetings, convenings, and agriculture sector working groups to support flagships and NAIPs. In addition, AGRA funded enhancements to Ministry of Agriculture monitoring and evaluation systems through direct grants, ministry staff trainings, consultations, and equipment donations. Taken together, this support was intended to help national governments develop, implement, and monitor complex and wide-reaching agriculture programs. These programs would then crowd in large-scale public, private, and donor investment in agricultural transformation.

Evaluation questions

We answered several evaluation questions to assess how AGRA's support affected governments' ability to plan and coordinate agricultural programs (see Exhibit 6).

Exhibit 6. Evaluation questions on state capability

Primary question:
• How has AGRA's support to state capability affected governments' ability to plan, coordinate, and drive investment?

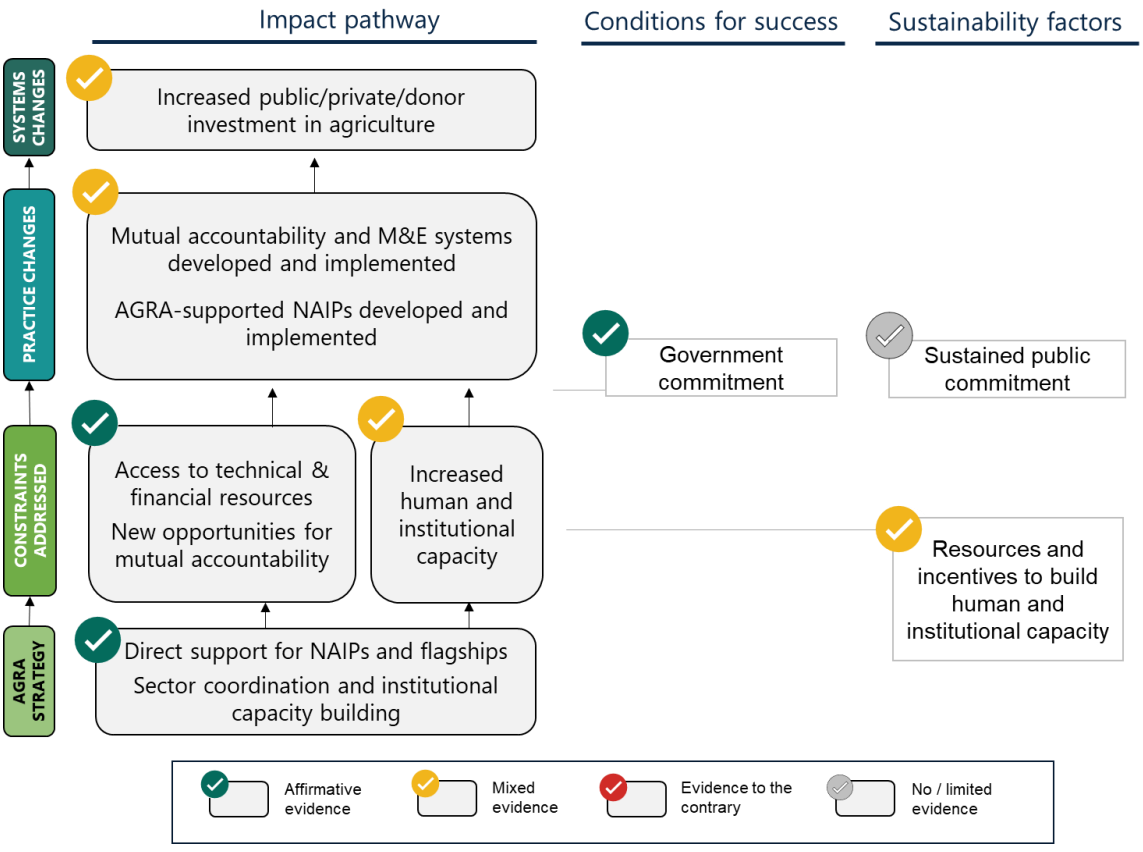
Secondary questions:

- How is the state capability approach supported by AGRA a relevant tool to facilitate and fast-track NAIP implementation in focus countries? Are governments buying in to flagships?
- How effective has AGRA's input into NAIPs and national development plans been in improving government capabilities for planning and strategy?
- How does AGRA's work affect public investment flow and funding?
- To what extent have flagships served AGRA's inclusion goals, particularly with respect to women and youth?

Key evaluation findings

AGRA was successful in facilitating and fast-tracking multiple NAIPs and flagships. From 2017 to 2021, AGRA helped develop several flagships, of which six proceeded to some stage of implementation. The two countries that began flagships early in Phase 2, Ghana and Burkina Faso, had the most success in leveraging donor and public resources and proceeding to execution at scale by 2021. AGRA had a major role in designing the flagships and mobilizing support and funding for them, most notably through the Planting for Food and Jobs (PFJ) flagships in Ghana. Strong and continued national government commitment to flagships was a key condition to their prompt advancement. This condition was met largely during Phase 2 because AGRA's support for flagships was responsive to acting administration priorities. Beyond 2021, the fate of flagships depends largely on continued commitment from future political appointees and governing regimes, as well as public authorities' longer-term incentives to build in-house capacity to develop and execute these agriculture programs.

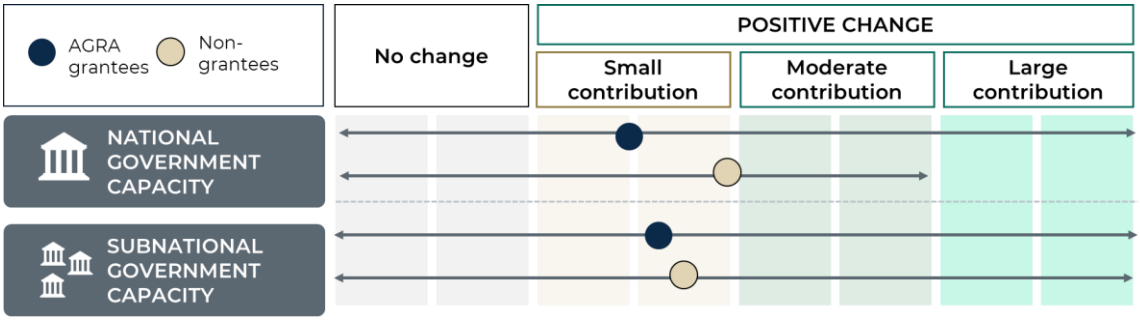
Exhibit 7. Evaluation findings along the state capability ToC



Governments have made advances in planning and coordinating flagships alongside AGRA, but they still lack basic technical and managerial capacity. Government buy-in and ownership of flagships are strong, due in large part to AGRA's willingness to adopt and support public officials' visions for flagships. This highly responsive approach essentially guarantees government ownership of flagships, barring regime changes. However, it may also limit AGRA's ability to reorient flagships that are not aligned with agricultural transformation goals and government commitments. In terms of analytic capacity to design flagships and managerial capacity to execute them, most governments were still heavily dependent on AGRA support to fill capacity gaps as of 2021. Perhaps for these reasons, survey respondents generally assigned AGRA a small role in building national and subnational capacity to drive agriculture programs since 2017 (Exhibit 8). Despite this modest progress overall, there is evidence that AGRA's direct technical and financial support has enabled a smaller set of governments to plan and implement investment programs on their own. In Ghana, Nigeria, and Ethiopia in particular, public officials have made large strides in planning and administering agriculture programs.

> **The capacity building that AGRA has done is only when they do workshops or have a consultant who has a methodology; then people are able to learn things from there.**
> ***—Public official***

Exhibit 8. AGRA's contribution to public capacity for agricultural programming, 2017–2021



Source: 2021 Structured web survey; N = 51 AGRA direct partners and knowledgeable stakeholders

AGRA helped crowd in and align donor and public funding through flagships in four countries. In Burkina Faso, Ghana, Kenya, and Tanzania, AGRA's support helped governments mobilize investment for flagships. For example, AGRA's leadership in writing the strategic plan for Ghana's PFJ flagship helped leverage an estimated US$260 million in public and donor funding. Similarly, World Bank officials credited the investments they made in Kenya's flagship to AGRA's convening efforts. In Mozambique and Ghana, stakeholders also noted that flagships provide central frameworks for various actors—including national governments, donors, and AGRA—to align their efforts and coordinate investments. For example, AGRA's leadership on PFJ helped representatives from the World Bank, Global Affairs Canada, AfDB, FAO, and the USAID-Ghana Mission to align their multiyear agriculture investments. In interviews, public officials and AGRA staff noted that flagships have also leveraged private sector investment. However, interviewees provided few tangible examples of this leverage.

Flagships do not incorporate gender and inclusion goals, with some notable exceptions. Malawi and Mozambique flagships are centrally focused on promoting women and youth involvement in agriculture, which is commendable. Also commendable are explicit targets for women and youth in the rice flagship in Burkina Faso and the agro-industrialization flagship in Tanzania. However, most flagships outside

Malawi and Mozambique reflect no systematic assessment of barriers to participation for women and youth. Furthermore, collection of age- and gender-disaggregated data to track flagship progress is sporadic.

Stakeholders reported that AGRA's flagship development support was somewhat inclusive, but there is room for improvement. Although AGRA and public officials engaged key stakeholder groups such as civil society and farmers in the process, civil society stakeholders reported that often these consultations occurred once programs were already generally conceived. As a result, AGRA-supported flagships mostly reflected government priorities and had a somewhat narrow focus on basic grains and subsidies. Conceivably, consulting a wider range of civil society and private sector actors could generate more diverse flagship concepts around sustainable local food and agricultural systems, food and nutrition security, soil management, and suitable financing packages for SMEs and farmers.

Partnerships

Through partnerships, AGRA has attempted to address some of the primary constraints to agriculture investment in Africa: information asymmetries and high transaction costs between investors and capital seekers, lack of technology dissemination, and limited linkages between investors and downstream technical partners. Through grants, non-funded partnerships, and the Agribusiness Deal Room, AGRA has attempted to link global buyers, investors, and technology players with agribusiness SMEs, farmers, and other downstream partners. From 2017 to 2021, AGRA supported strategic partnerships through over 100 engagements and nearly $3 million in funding. Most partners are private off-takers and input providers based in Africa. However, global technology partners, African financial institutions, multinational corporations based in Europe and the U.S., and large donors are also represented. Partnerships focus on last-mile delivery, mechanization, inclusive finance, regional trade, COVID-19 mitigation, and gender-inclusive SME services, among other topics. The overarching goal of these efforts is increased private sector investment in agriculture, leading to stronger (and more) SMEs and a wider array of last-mile services and products available to smallholders.

Evaluation questions

To assess AGRA's success in engaging the private sector, we answered several evaluation questions (see Exhibit 9).

Exhibit 9. Evaluation questions on partnerships

Primary question:
• How successful has AGRA been in engaging private sector partners?
Secondary questions:
• To what extent are AGRA partnerships supporting scaling business models toward increased investments and toward improving productivity of smallholder farmers? • How has AGRA's support worked to address bottlenecks in last-mile delivery and cluster development? • To what extent has AGRA leveraged public and private investments in the agriculture sector across the 11 focus countries? • What role has the Agribusiness Deal Room contributed to new partnerships and investments across the continent? • What evidence is there that suggests outcomes are sustainable beyond the life of the intervention? • What role and impact have Development Finance Institutions (DFIs) and other innovative financial solutions had in de-risking investments in agriculture to micro-, small-, and medium-sized enterprises (MSMEs)?

Key evaluation findings

AGRA has successfully engaged with the private sector, leveraging millions in private funding. Through its matchmaking and proactive partnership development efforts, AGRA has attracted private sector investment (see Exhibit 10). AGRA reports that it has leveraged $141 million in investment from the private sector, surpassing its target of $100 million (AGRA's Evaluation Report 2017-2020, Theme 2: Strategic Partnerships, May 2021). This is an inherently difficult indicator to verify, given strong incentives for partners to over-report true leverage. However, stakeholders generally agreed that AGRA was successful in leveraging private sector investment, assigning AGRA a small-to-moderate contribution to an overall positive tendency in private investment in agriculture over the past five years (see Exhibit 11).

Exhibit 10. Evaluation findings along the partnership ToC

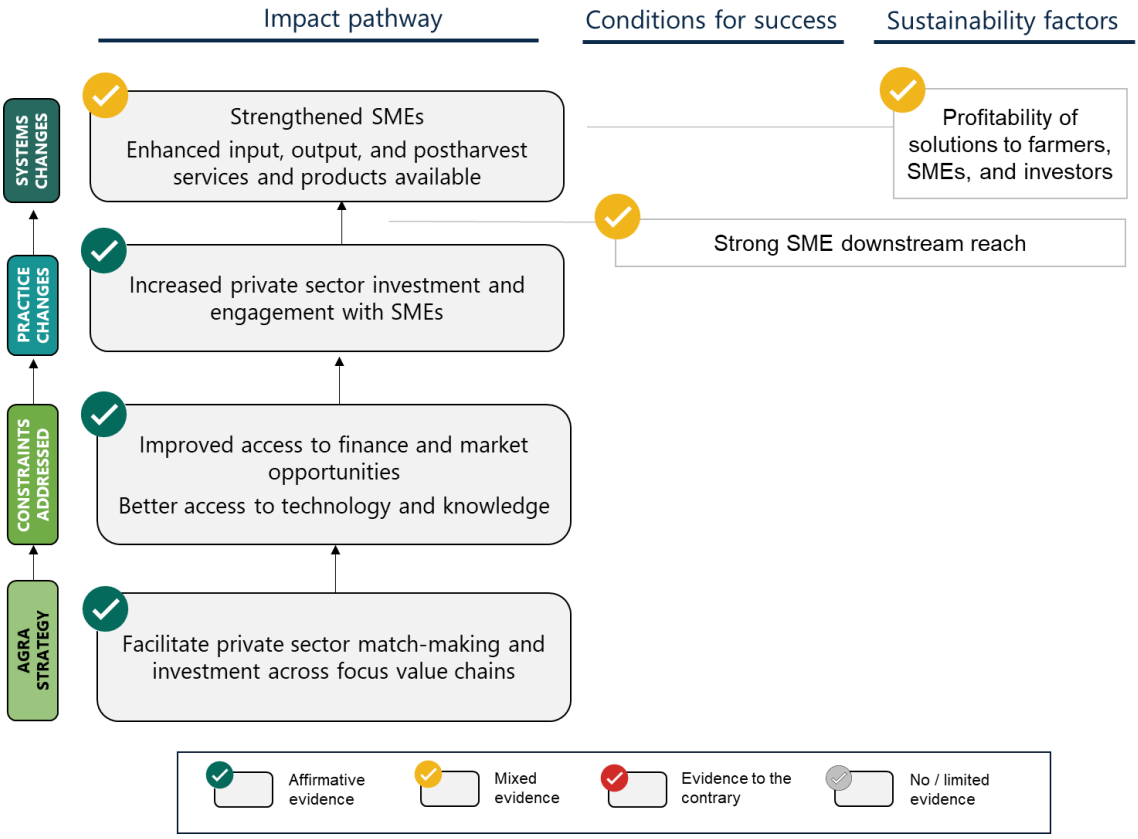
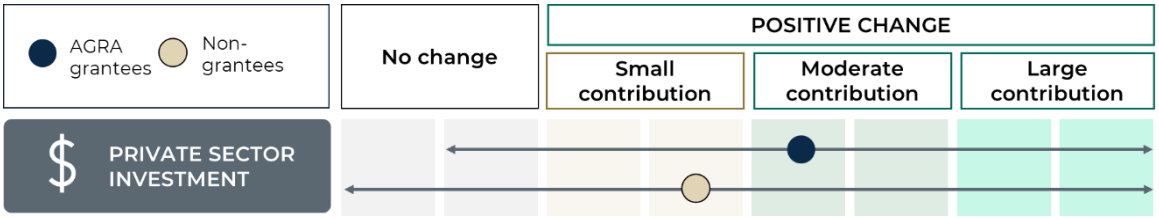


Exhibit 11. AGRA's contribution to private investment in agriculture, 2017–2021



Source: 2021 Structured web survey; N = 49 AGRA direct partners and knowledgeable stakeholders

AGRA's partnerships team has played a large role in providing smallholders with access to mechanization, and to a lesser extent inputs and extension. Of AGRA's entire partnerships portfolio, the mechanization models have shown the strongest ability to de-risk lending, boost the uptake of mechanization, and earn profits for SMEs and farmers. From 2017 to 2021, AGRA successfully scaled mechanization models through Trotro in Ghana, ETC Agro in Tanzania, and Hello Tractor in Kenya—extending their reach to tens of thousands of farmers. And through partnerships with Microsoft, Bayer, and AFAP, AGRA has extended digital extension services, fertilizer, and seed to smallholder farmers. For example, over 700 VBAs are using digital platforms to register farmers and broadcast information on weather, seeds, and fertilizer to over 30,000 farmers through AGRA's partnership with Microsoft. Most

of these services are still in pilot stages, and thus small in scope compared to the magnitude of farmers' current needs.

Sustainability and successful scale-up of new models hinge on their profitability, which is unclear at present. Across multiple partnerships, AGRA has helped structure and begin to scale a few profitable models that might ensure long-term private sector engagement—notably tractor rental services. However, the profitability of the larger set of AGRA-supported business models is still unclear, and preliminary results are mixed. For example, a few digital financial service models have demonstrated strong break-even potential, whereas digital extension services have yet to establish a viable business model. It is premature to assess the profitability of AGRA's full set of partnerships after four years, as five to seven years to break-even is a conventional benchmark. Longer-term private sector engagement with farmers at scale will depend on whether AGRA can help surface and expand models in the realms of input delivery, extension, inclusive finance, mechanization, and output markets—and whether these models can demonstrate profits at scale. It also depends on AGRA's ability to prioritize partnerships that leverage its strengths relative to other actors in this space, including its strong downstream connections with SMEs, its credibility with public officials, and its growing network of multinationals and investors.

The Agribusiness Deal Room has been successful in linking investors with capital seekers, but it overlooks the "hidden middle." The Deal Room is an in-person and virtual platform that matches investors with public and private actors seeking capital. The number of Deal Room participants and investors has grown dramatically since the forum's inception in 2018. By 2021, AGRA had recorded over $300 million in investment commitments linked directly to the Deal Room, and many of AGRA's current partnerships originated in this forum. In interviews, however, stakeholders noted that the Deal Room has some redundancies with other similar forums and often features a mismatch between investors and capital seekers, as investors often offer too little capital that is not tailored to the African market and context. To create a unique niche for the Deal Room among matchmaking forums, stakeholders encourage AGRA and its partner, the African Green Revolution Forum (AGRF), to invest even more in finding the African "hidden middle" of micro-, small, and medium-sized enterprises (MSMEs) that have the most potential to expand operations, yet some of the fewest opportunities for finance. However, serving this segment would require that AGRA provide even more technical assistance (TA) to prepare MSMEs for interactions with investors.

> **The Deal Room is business as usual with many actors looking at few deals…. AGRA and partners need to invest more in the Deal Room TA programming and go a tier lower and support the hidden middle [of African SMEs] and make them more attractive to the bigger financiers.**
>
> ***–Private sector partner***

AGRA's blended finance and SME finance investments have likely de-risked finance and stimulated lending, but they have not penetrated consortia at scale. AGRA currently pursues a two-pronged approach to inclusive finance: (1) blended finance to increase the availability of capital, and (2) SME finance to lower the cost and risk of agriculture lending. The Agribusiness Capital (ABC) Fund is one of AGRA's most recent investments in blended finance. AGRA invested $5 million in first-loss capital into the fund and offers TA for investees alongside capital to further de-risk investments. Since 2019, the ABC Fund has leveraged three large investors and 11 investments totaling EUR 10.8 million. Similarly, AGRA is working with the Bank of Ghana to establish a guarantee facility called GIRSAL. As of 2021, the fund had crowded in $14 million in investment from the African Development Bank and

stimulated GHS 66 million in lending. These blended finance investments occur upstream of consortia, and thus have no direct linkages with SMEs and farmers served by consortia. In contrast, AGRA's SME finance investments penetrated some consortia from 2017 to 2021, but not at scale. For example, AGRA's recent SME finance pilots reached only 36,000 farmers linked to consortia in Ghana, Burkina Faso, and Mali, compared to the full population of over 500,000 targeted farmers in these consortia. Perhaps given the small overlap between AGRA's inclusive finance and consortia investments, web survey respondents gave AGRA a relatively low contribution score for its role in enhancing farmers' access to finance. (See Volume II, Appendix F for a more detailed contribution narrative for PIATA's inclusive finance work.)

AGRA maintains a strong focus on women and youth in its partnership work. In recognition of the challenges women and youth face in accessing investment, AGRA partnerships staff focus on these two groups' participation in the Deal Room and promote gender- and youth-intentional networking platforms and knowledge-sharing events. At the 2020 Deal Room, women and youth SMEs had 57 percent and 31 percent participation, respectively, in the pipeline presented to investors. AGRA has also introduced VALUE4HER, a service delivery platform for women entrepreneurs, in several countries. The platform is designed to connect women entrepreneurs in agriculture with finance, technology, and other services. VALUE4HER is one of the only examples of gender-intentional programming at AGRA, in which programmatic supports are designed in response to women's unique constraints to growth. However, VALUE4HER currently lacks a viable business model, including key revenue streams that can sustain in-country supports.

Systems Development

In the next sub-sections, we present systems development findings along the value chain cycle—starting with input supply and distribution systems, then moving to extension and integrated systems.

A. Input supply

AGRA spent over $22 million in grants to build public and private sector capacity in input production across 10 countries, with concentrated investments in Rwanda and Ethiopia at $5.9 and $4.4 million, respectively. AGRA's work in input supply systems heavily focused on increasing the supply of quality certified seeds. AGRA provided seed companies with funding, technical support, and business development services to boost their commercial production. AGRA also invested in upstream and downstream links in the seed supply system. Notably, AGRA financially supported research institutes' production of early generation seeds and foundation seeds in selected value chains, and invested in strengthening verification services for certified seed. Jointly, these investments would lead to more and stronger seed companies and greater farmer access to improved seeds.

Citing existing private sector investments in fertilizer from Yara, OCP, ETG, and other input suppliers in SSA, AGRA staff decided against making large investments in fertilizer production. However, they made modest investments in developing regional fertilizer maps, linking private actors to public research institutions, and providing direct technical and financial support to fertilizer companies in Nigeria, Uganda, Ghana, and Malawi.

Evaluation questions

Reflecting on AGRA's outsized work on improving seed supply, the research questions to evaluate PIATA's input supply work focus heavily on seed systems (see Exhibit 12).

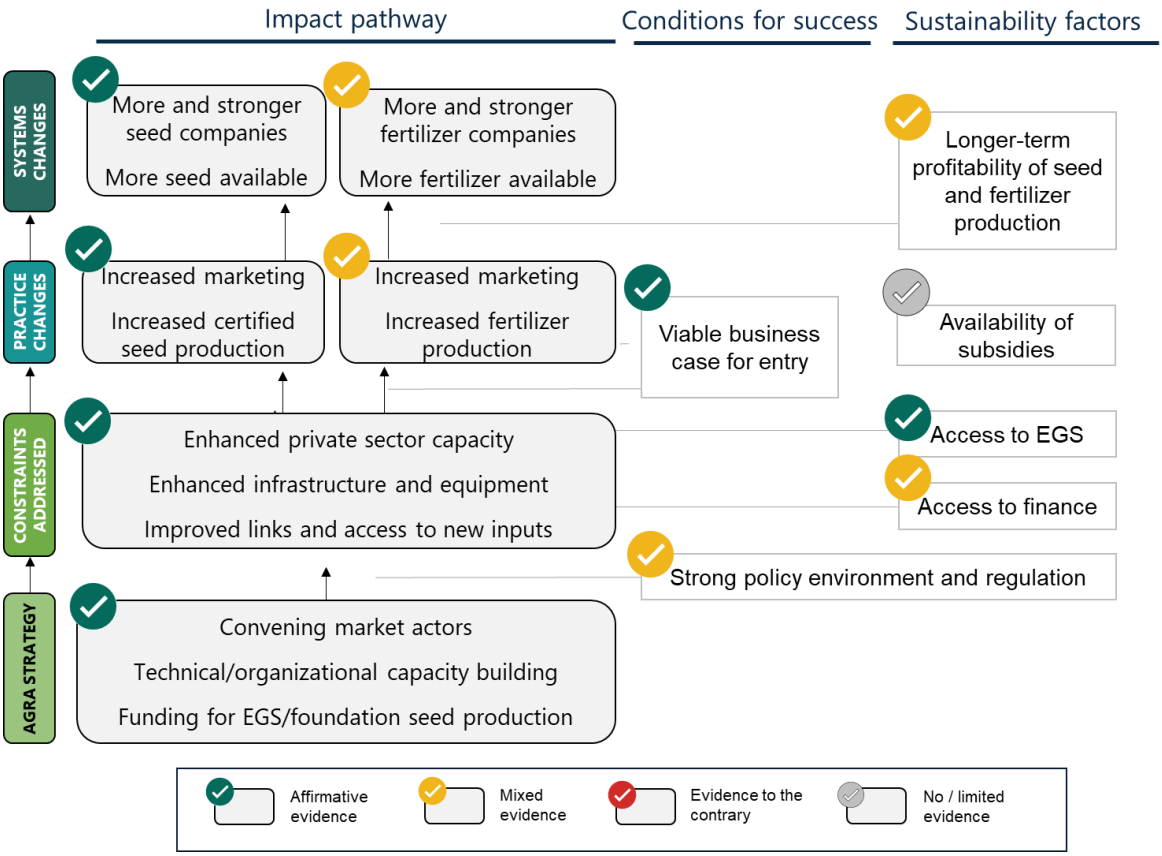
Exhibit 4. Evaluation questions for input supply systems

Primary question:
• What outcomes has AGRA's seeds systems approach created or contributed to?
Secondary questions:
• What evidence is there that suggests outcomes are sustainable beyond the life of the intervention? • How could implementation of the seed sector approach have been improved?

Key evaluation findings

AGRA was successful in increasing the supply of certified seed. AGRA convened market actors, built private sector capacity, and supported early generation seed production. Through these efforts, it improved certified seed production and delivery (see Exhibit 13). In particular, AGRA helped African SME seed companies professionalize and expand operations, thus increasing the supply of certified improved seed in focus countries. These efforts were particularly successful in boosting certified seed production in Rwanda, Ethiopia, Ghana, and Nigeria, buttressed by strong government support and a viable business case for seed companies to engage. Seed companies appear on a healthy technical and financial trajectory as of 2021. However, companies' access to finance and early generation seeds, potential for profits, and availability of subsidies will all play a large role in determining whether these advancements in certified production are sustained in future years.

Exhibit 13. Evaluation findings along the input supply ToC



AGRA's fertilizer supply chain efforts were less successful than its seeds work, reflecting its strategic decision to focus on seeds. Private and public actors were successful in drafting regional fertilizer maps and validating appropriate fertilizer blends with AGRA's support. However, systematic cost and distribution constraints precluded production and distribution at scale in most focus countries. To some extent, these outcomes likely reflect AGRA's decision to focus on seed production over fertilizer production—and thus its lack of systemic support for fertilizer production. Yet, the lack of fertilizer access could have dampened yield impacts, as discussed later.

Seed companies appear to be profiting from improved seeds—and even expanding to meet demand. AGRA's work has helped crowd in existing and new seed companies into focus countries, as companies are attracted by the prospect of profits. In Tanzania, Nigeria, Uganda, Rwanda, and Mozambique, the number of registered seed companies rose dramatically from 2017 to 2021 to serve increased farmer demand. (This demand was driven in part by AGRA's extension and input distribution investments, discussed below.) AGRA-supported seed companies have started new production operations and significantly expanded their certified seed production activities.

Sustainability of private production hinges on continued demand and profits—and thus subsidies. This requires seed company access to finance and early generation seeds, sustained farmer demand, and a conducive policy environment. A potential reduction in subsidies in future years could have a detrimental effect on farmers' demand for improved seeds and fertilizer, as well as seed companies' margins—both of which could heavily impact profits. Additional donor and public funding is likely also required for continued upstream seed system investments, particularly with respect to seed sector regulatory improvements to ensure quality seeds are available.

> **When the subsidy is no longer there, actual demand will show its face and the level may not be sufficient to sustain that level of seed production effort.**
>
> ***–Seed expert in Ghana***

B. Input distribution

AGRA invested over $5 million in input distribution from 2017 to 2021, with particularly large investments in Tanzania and Mozambique. AGRA grants funded agriculture training and business development services for seed companies and agro-dealers, as well as networking between input suppliers, VBAs, and farmers. This support was meant to increase input suppliers' ability to engage farmers and market the new products that they procured through new, AGRA-supported market linkages. Training and business development services were also intended to improve input suppliers' business practices, largely through increased technology adoption. AGRA generally supported existing agro-dealers, but in some countries AGRA grant funding supported new entrants to the market—particularly at the local or village level. All investments were intended to increase farmers' access to quality inputs, with farmer purchases resulting in profits for agro-dealers and seed companies. Motivated by more profits, input suppliers would consolidate and expand their offerings and farmer outreach, thereby strengthening input distribution systems.

Evaluation questions

To evaluate AGRA's contribution to input distribution networks through agro-dealer and seed company strengthening efforts, both within and alongside consortia arrangements, we answer several evaluation questions (see Exhibit 14).

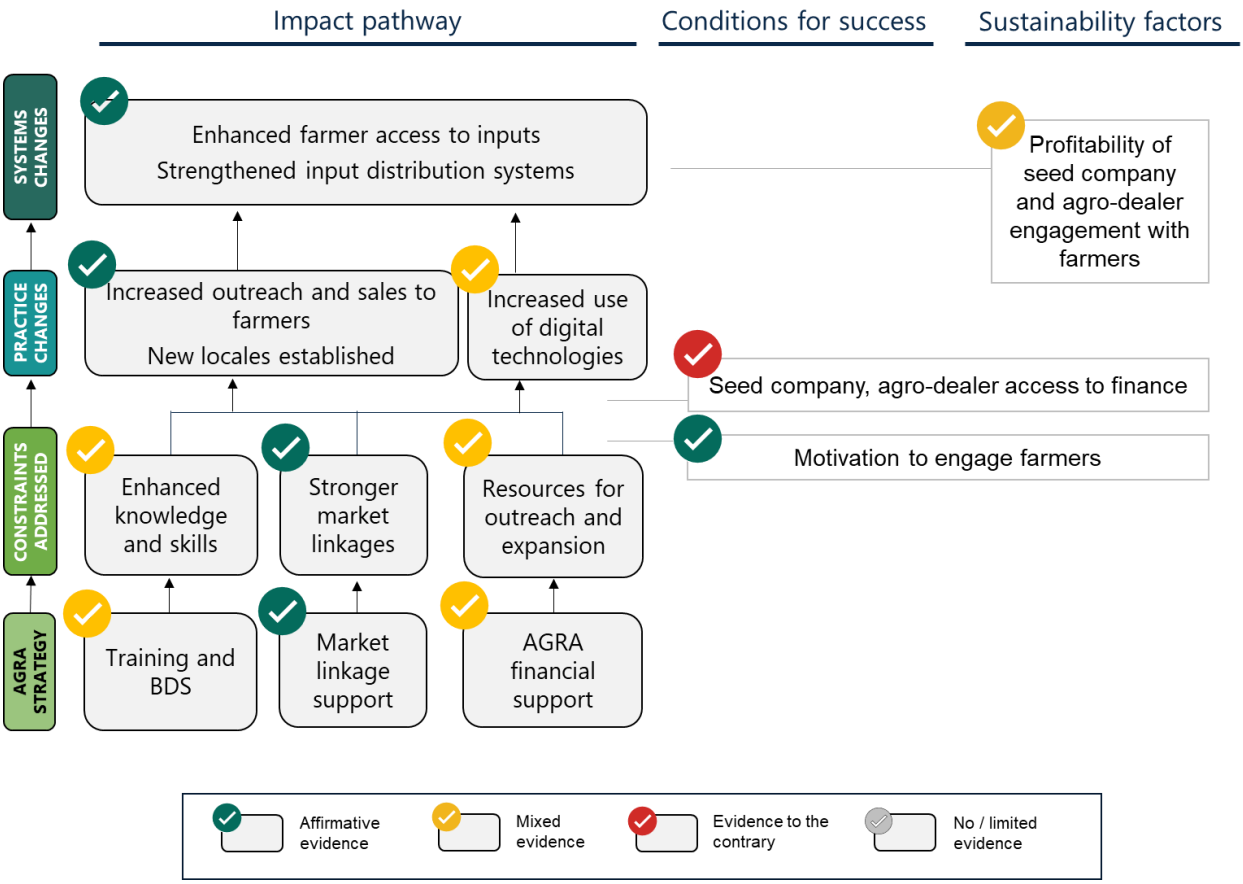
Exhibit 5. Input distribution evaluation questions

Primary question:
• What outcomes have AGRA's input distribution investments created or contributed to?
Secondary questions:
• How well did AGRA's interventions in distribution trigger increased farmer access to quality inputs?
• Are outcomes sustainable beyond the life of the intervention?

Key evaluation findings

AGRA's input distribution support helped agro-dealers and seed companies boost profits. AGRA supported over 12,000 agro-dealers and seed companies with technical support to boost farmer outreach and improve market linkages. Overall, agro-dealers and seed companies strengthened the quality and quantity of linkages with farmers and fellow input suppliers. They also reported increasing their outreach to farmers, who responded favorably to new seed varieties with increased demand. This has led to increased sales for many agro-dealers and seed companies during and immediately following AGRA grant periods (Exhibit 15).

Exhibit 15. Evaluation findings along the input distribution ToC



Strengthened outreach and new rural locales have enhanced farmers' demand for and access to quality inputs. In interviews, seed companies and agro-dealers remarked that their increased farmer outreach has led to more informed choice among farmers, as well as greater demand for their products. In response to this increased farmer demand for inputs, several existing seed companies and agro-dealers also expanded operations, particularly in Mozambique and Kenya. Importantly for smallholders, village agro-dealers supported by AGRA have also improved last-mile delivery of seeds and chemicals to farmers in rural areas, particularly in Ethiopia and Tanzania.

Agro-dealers and seed companies strengthened their market linkages and organizational capacity, but finance constraints pose challenges to sustainability. Agro-dealers strengthened market linkages with other input suppliers—including other dealers and seed companies—in addition to fertilizer and chemical companies. In interviews, agro-dealers mentioned that the direct linkages to seed companies were particularly important, as this gave them more authoritative information about new seeds' characteristics and requirements. Seed companies described using grant funding to expand their outreach operations and train their staff on topics such as packaging and marketing activities. However, finance constraints continue to inhibit most seed companies' and agro-dealers' ability to fully exploit these new linkages and skills. Even after establishing new input supply linkages, agro-dealers commonly reported not being able to purchase enough inputs to stock their shelves. And although seed companies noted the benefits of increased farmer engagement, overall, they did not feel that they would be able to finance this increased outreach in the absence of AGRA support.

> **"We sellers face capital challenges; we have a lot of customers, serving them on time becomes impossible due to shortage of capital."**
>
> ***—Agro-dealer in Tanzania***

C. Extension

AGRA invested over $25 million in extension from 2017 to 2021 in nine countries, with particularly large investments in Ethiopia ($5 million), Mozambique ($4 million), and Ghana ($3.4 million). In Ethiopia, AGRA strengthened the public extension services. Across the other eight focus countries, AGRA implemented the VBA model of extension, whereby trusted village leaders and experienced farmers were trained to act as community extension workers and market facilitators. Under the VBA model, AGRA grantees selected VBAs and trained them on good agricultural practices, improved inputs, and postharvest practices. VBAs were then expected to establish demonstration plots in their communities to demonstrate the value of good agricultural practices and improved inputs. VBAs would also deliver farmer training, provide on-demand advice to farmers, and distribute free inputs as samples. The goal was to build farmers' skills and stimulate their demand for improved seeds and fertilizer. VBAs would also leverage newly established relationships with seed companies and agro-dealers to provide farmers with low-cost and timely inputs. As a result, farmers would begin purchasing inputs through VBAs, whereby VBAs would earn commissions on these sales. Within the consortia model, VBAs were also meant to take on a role in output markets, serving as aggregators among the farmers they served.

Evaluation questions

We assess AGRA's contribution to extension and market systems, largely through the VBA model. See Exhibit 16 for the full set of research questions addressed.

Exhibit 6. Extension evaluation questions

Primary question:
• What outcomes has AGRA's extension approach created or contributed to?
Secondary questions:
• How well did AGRA's interventions in extension trigger increased farmer access to quality inputs? • Are outcomes sustainable beyond the life of the intervention?

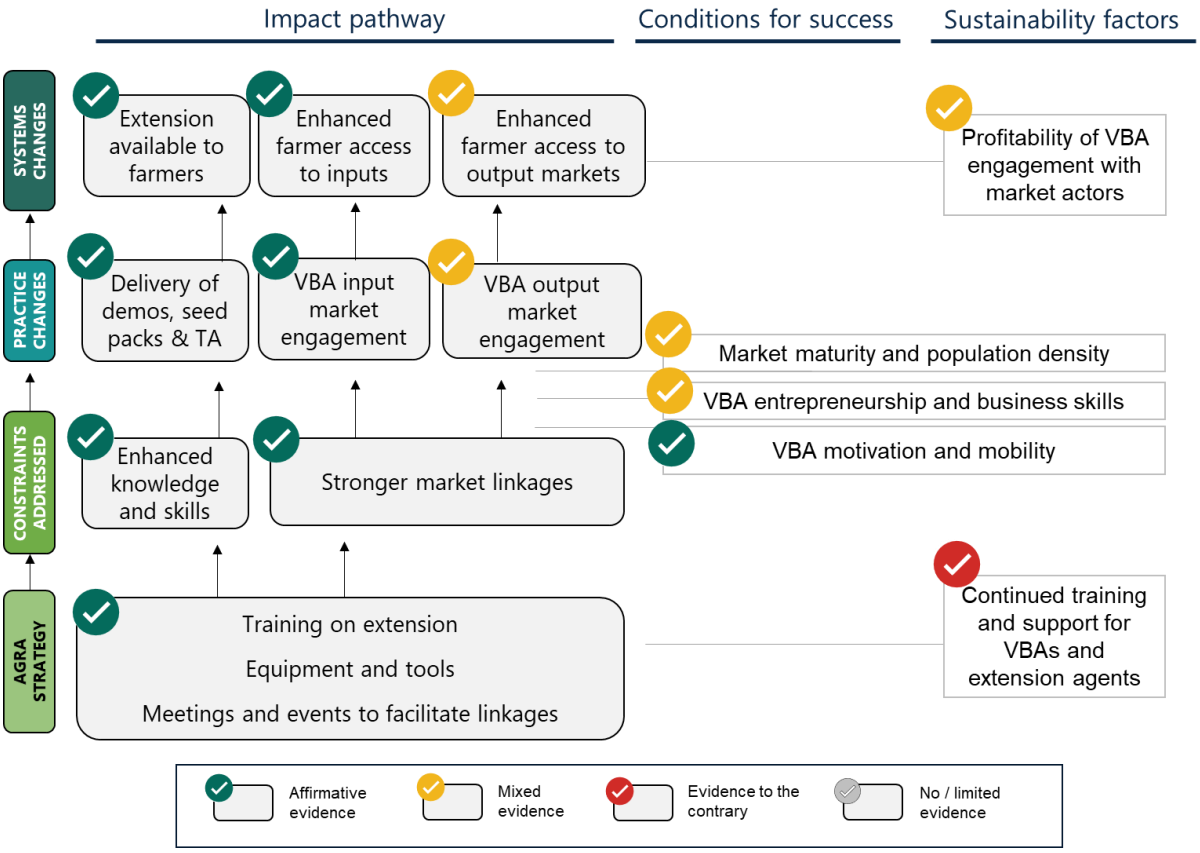
Key evaluation findings

Through VBAs, AGRA reached over 10 million farmers. AGRA trained over 30,000 VBAs on good agricultural practices and improved inputs and fostered VBAs' linkages with seed companies, agro-dealers, and output market actors (AGRA Program Performance Report Q4, 2020). By 2021, AGRA reported that VBAs had reached 10.1 million farmers through its systems development work, largely through VBA-administered demonstration plots and seed packs (AGRA Emerging Results: 2017-2020).

VBAs were successful in providing farmers with extension and access to inputs—but less successful in linking farmers with output markets. Surveyed VBAs widely reported establishing demonstration plots and selling farmers improved inputs. In focus groups across multiple countries, farmers noted that VBA-led trainings were very insightful, viewed VBAs' advice as highly practical, and held their VBAs in high esteem. Although most VBAs appeared to deliver sound extension and improve farmers' access to improved seeds through samples and sales, VBA involvement in output markets varied widely by country (Exhibit 17). According to AGRA's 2020 Geopoll phone survey of nearly 1,000 VBAs across six countries, only a small portion of VBAs in Burkina Faso and Tanzania reported aggregating production, whereas most VBAs in Mozambique reported doing so (AGRA 2020). This variation was likely driven by more mature output markets in some focus countries (like Mozambique) versus others (like Burkina Faso).

"Of everyone that comes to the community, the VBA is the most helpful—especially their training."
—Farmer in Kenya

Exhibit 17. Evaluation findings along the extension ToC



AGRA's investments in strengthening extension in Ethiopia

In contrast with the focus on VBAs in other countries, AGRA invested in strengthening the public extension system in Ethiopia. The Ethiopian extension system is grounded in farmer training centers, which have designated extension agents called Development Agents (DA). These DAs provide farmers with training on improved farming techniques and market information and advisory services. With $5 million in investments, AGRA provided farmer training centers and DAs with motorbikes, furniture, computers, printers, and projectors. AGRA also funded enhanced training for extension agents in good agricultural practices, postharvest handling, and market linkages. In addition to the advisory services, AGRA funded the distribution of improved seeds and post-harvest handling bags to lead farmers in targeted villages.

According to interviewed stakeholders, AGRA's support for extension workers in Ethiopia was well-designed and aligned with the government of Ethiopia's plans and priorities around extension. In buying motorbikes and projectors and training extension workers in good agricultural practices and inputs, stakeholders reported that AGRA has improved both the quality of extension and the quantity of farmers reached. According to farmers and DAs, the result is improved adoption of good agricultural practices and inputs in Ethiopia among those farmers in enhanced agents' catchment areas, accompanied by enhanced production and sales. Stakeholders' single complaint about AGRA's support in Ethiopia is that it was limited to a small number of districts and farmers in need. As of late 2021, the Ethiopian government was in deliberations to expand AGRA-funded improvements more widely throughout the country. ◢

VBAs' weak business case and lack of continued support threatens their longer-term sustainability. Across all countries, VBAs expressed a strong desire to continue engaging farmers, but only a portion may possess the required entrepreneurial spirit, business skills, and finance to profit from this engagement. In Kenya, for example, VBAs make profits from commissions only during the planting season, and they must continually expand their customer base to make profits. In Ghana, interviewed VBAs reported no income from commissions. (In Mozambique, some VBAs reported healthy profits from aggregation, making it the potential exception among deep-dive countries.) Substantial numbers of VBAs have transitioned into more formalized agro-dealer activities in Mali, Mozambique, and elsewhere—often setting up small shops in village centers. This transition has good prospects for VBAs' financial self-sufficiency, but it is not the norm. In part, the low portion of VBAs who transition into an agro-dealer role may reflect the profile that AGRA targeted for VBAs: trusted farmers who were not necessarily entrepreneurs. Further diminishing VBAs' prospects for sustainability is the lack of ongoing training and support planned for current VBAs, as no public or private actors have assumed this responsibility in the post-grant period (Exhibit 17).

D. Integrated approaches (consortia)

AGRA's consortia work focused on strengthening the interconnected systems within sub-national regions. This included targeted investments in input markets, extension, and output markets. Previous chapters discuss AGRA's input market and extension investments with seed companies, agro-dealers, VBAs, and extension agents—often in the context of consortia. To strengthen output markets through consortia, AGRA provided both farmer groups and buyers with training, machinery, and warehouses, and coordinated farmers' and buyers' entry into structured markets. Some consortia also made large investments in finance and mechanization, given acute farmer and SME needs in these areas. The overarching objective of all these measures was to mitigate farmers' and SMEs' fundamental constraints

to growth—including access to extension, finance, and markets—thus stewarding farmers into commercial production.

Overall, AGRA spent $45 million on consortia in its seven "push" countries. Given the relatively nascent agricultural systems in these countries, a primary goal of AGRA's consortia work was to drive transformation by improving farmers' access to seeds, fertilizer, and extension. AGRA made particularly large consortium investments in Mozambique ($11 million), Burkina Faso ($10 million), and Ethiopia ($7 million). Consortia in Tanzania and Mozambique had some of the most balanced investments across input supply, extension, and market access—whereas consortia investments in Burkina Faso focused on enhancing output markets, and consortium funding in Ethiopia focused on extension. Consortia in Ghana, Tanzania, and Burkina Faso featured relatively large investments in finance and mechanization.

Evaluation questions

We answer several evaluation questions to assess the overall contribution of consortia to system actors' access to finance, inputs, and output markets (see Exhibit 18).

Exhibit 18. Evaluation questions on consortia

Primary question:
• How effective has AGRA been in driving integrated approaches to systems development?
Secondary questions:
• Have consortia helped increase farmers' access to finance and output markets? • To what extent have consortia "crowded in" new market actors and investments? • What evidence is there that suggests consortia are sustainable beyond the life of the intervention?

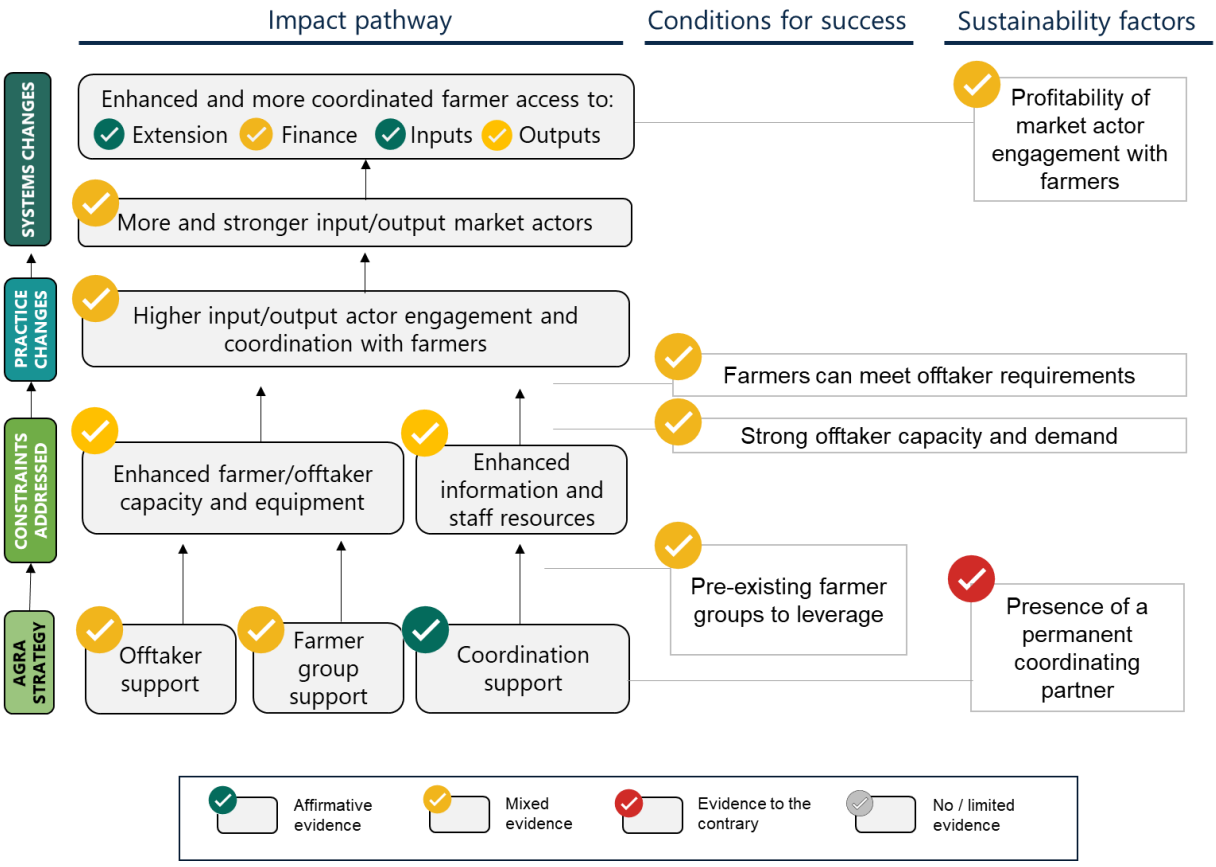
Key evaluation findings

AGRA's consortia straddled the goals of increased production and food security on one hand, and output markets and agricultural transformation on the other. AGRA's consortia investments in Ethiopia and Ghana appeared to focus on production or food security, with large investments in inputs and extension. In contrast, consortia in Mali and Burkina Faso had a stronger focus on building linkages between farmers and output market actors. Consortia in Tanzania and Mozambique straddled these two objectives, with some consortia appearing to focus more on production, and others to focus more explicitly on output markets. These differences in focus and objectives across consortia are expected and potentially desirable. However, in some instances AGRA and its grantees conflated these two objectives, leading to confusion and unmet farmer expectations. In focus groups in Tanzania, for example, farmers noted that they were still waiting for help with output markets at the close of grant funding, despite the fact that their consortium made little investment in output market linkages.

Overall, consortia had general success strengthening extension services and input markets, but less success in output and finance markets. Stakeholder discussions and AGRA surveys suggest that large AGRA investments in VBAs and extension systems enhanced the knowledge and practical skills of farmers in consortium target areas, as well as their demand for improved inputs. Similarly, AGRA-funded support for seed companies and agro-dealers in consortia areas helped these SMEs strengthen their input linkages and leverage VBAs to meet growing demand. AGRA also had success strengthening output and finance markets through consortia, but in a smaller subset of countries and regions. For example, in

Mozambique AGRA-funded coordination between buyers, VBAs, and farmers significantly strengthened output market linkages. Across all five deep-dive countries, however, stakeholders generally noted that AGRA reached more farmers through its extension and input market investments than its output market and finance investments (see Exhibit 19). In the structured web survey, for example, 61 and 51 percent of AGRA grantees reported that extension and input market improvements had widespread farmer reach, respectively.[2] In contrast, only 27 and 22 percent of grantees reported that output and finance market improvements had widespread farmer reach, respectively. This likely reflects AGRA's well-established expertise and relationships in input supply systems and markets (relative to output markets) as well as the lack of strong overlap between farmers targeted by AGRA's inclusive finance initiatives on one hand, and consortia on the other.

Exhibit 19. Evaluation findings along the consortia ToC



New private sector actors have crowded into input and output markets, attracted by potential profits. In Mozambique in particular, AGRA's consortia investments appear to have triggered private investment from input suppliers. Through AGRA's partnerships work, Yara invested around $725,000 in fertilizer supply, Bayer introduced hybrid maize seeds to SMEs and farmers (120 tons valued at $282,000), and Klein Karoo Seed Marketing established a locale in Mocuba to sell inputs to hub agro-dealers. In interviews and presentations, stakeholders also cited the role of cassava, rice, and maize consortia in Ghana, Mozambique, and Burkina Faso crowding in aggregators and large processors. The AGRA Geopoll survey suggests these moves may be profitable: buyers in Mozambique reported an

[2] Widespread farmer reach is defined as at least half of farmers in grantees' geographic area experiencing enhanced access.

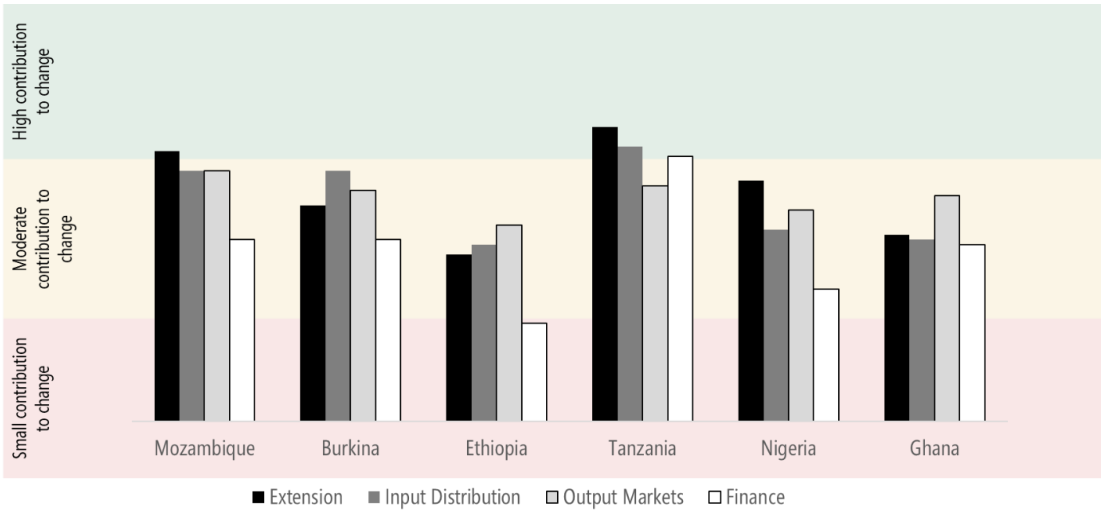
increase in the profitability of maize in 2020 compared to 2017, as did rice buyers in Burkina Faso. Although it is a positive development, off-taker crowding appears smaller in magnitude than input actor crowding, as evidenced by stakeholders' general sentiment that AGRA reached more farmers through enhanced input linkages than strengthened output linkages.

Consortia boosted structured agreements, but farmers' side-selling and difficulty meeting off-taker requirements have eroded trust. In interviews, agribusinesses in all consortia described entering into new structured agreements with farmers, and they credited AGRA and lead consortia partners with facilitating these agreements. However, stakeholders in several countries noted instances of farmers not honoring their structured agreements with agribusinesses when output price fluctuations resulted in more competitive prices on the open market. AGRA service providers noted that this was a consistent problem, and that lead consortia partners had to intervene to broker an outcome that was acceptable to all parties. In some consortia, farmers also struggled to meet off-takers' quantity and quality requirements. Many consortia attempted to directly address this condition through technical and financial support to farmer organizations. This consisted of increasing their storage capacity through the construction and/or enhancement of storage facilities, as well as targeted training for farmer unions on post-harvest handling. In part, farmers' ability to surmount these quality and quantity issues will determine the sustainability of several farmer–off-taker relationships that have been established through consortia (Exhibit 19).

Inclusive finance investments penetrated some consortia and countries, but not others. In Burkina Faso, AGRA facilitated blended finance arrangements with two large banks. In addition, AGRA's recent SME finance pilots reached 36,000 farmers linked to consortia in Ghana, Burkina Faso, and Mali. In Tanzania and Ghana, AGRA helped farmers linked to consortia access loans and extended finance to SMEs through revolving funds and blended finance. Web survey respondents rated AGRA's contribution to finance systems as relatively low compared to its extension and input-output market work.[3] However, stakeholders assigned AGRA a moderate contribution to improved finance in Tanzania, Mozambique, Burkina Faso, and Ghana, likely reflecting its inclusive finance work with SMEs (and farmers, in some cases) in these countries (Exhibit 20).

[3] It should be noted that AGRA did little inclusive finance work in Ethiopia by design. As such, a small contribution score would be expected for Ethiopia.

Exhibit 20. AGRA's contribution to market system changes through consortia



Source: 2021 Structured web survey; N = 161. Due to a small number of respondents, no results are presented for Mali.

Consortia's sustainability hinges on their ultimate profitability for all key actors and the presence of coordinating partners. Consortia will remain intact while they generate profits for input actors, output actors, and farmers. Currently, profits appear healthy for input actors but more varied for output actors and farmers as they work to establish sustained structured agreements. As farmers' primary conduit to other actors, VBAs also play a critical role in maintaining and consolidating farmers' new input and output linkages. However, the weak business case for VBAs and their lack of continued support may drive most VBAs to discontinue their activities across established consortia within five years. Furthermore, only in a few consortia in Ghana, Mozambique, and Ethiopia do local public authorities or off-takers appear to be taking ownership of the consortia's vital coordination function, often performed by NGOs during the grant period. This includes coordinating supply and demand between off-takers and farmers, as well as helping negotiate structured contracts and resolve sales and price disputes. This lack of ownership is particularly worrisome, as constant coordination and leadership are required to ensure that buyers' quality and quantity requirements are upheld and to resolve disputes between farmers and buyers.

Farmer-Level Outcomes

Inside and outside of consortia, AGRA's investments in inputs, extension, markets, and finance were designed to address farmers' binding constraints, thus freeing them to adopt good agricultural practices and inputs, produce marketable surplus, and engage with commercial markets. The desired result of farmers' enhanced market participation would be increased sales and profits, leading to enhanced household food security and resilience.

Evaluation questions

To assess the contribution of the full set of PIATA investments on farmer-level outcomes, we answered several evaluation questions (see Exhibit 21). In a sense, farmer outcomes reflect the joint influence of all of AGRA's multilevel investments discussed in previous sections, including policy reforms, flagships, partnerships, extension and input distribution, and consortia.

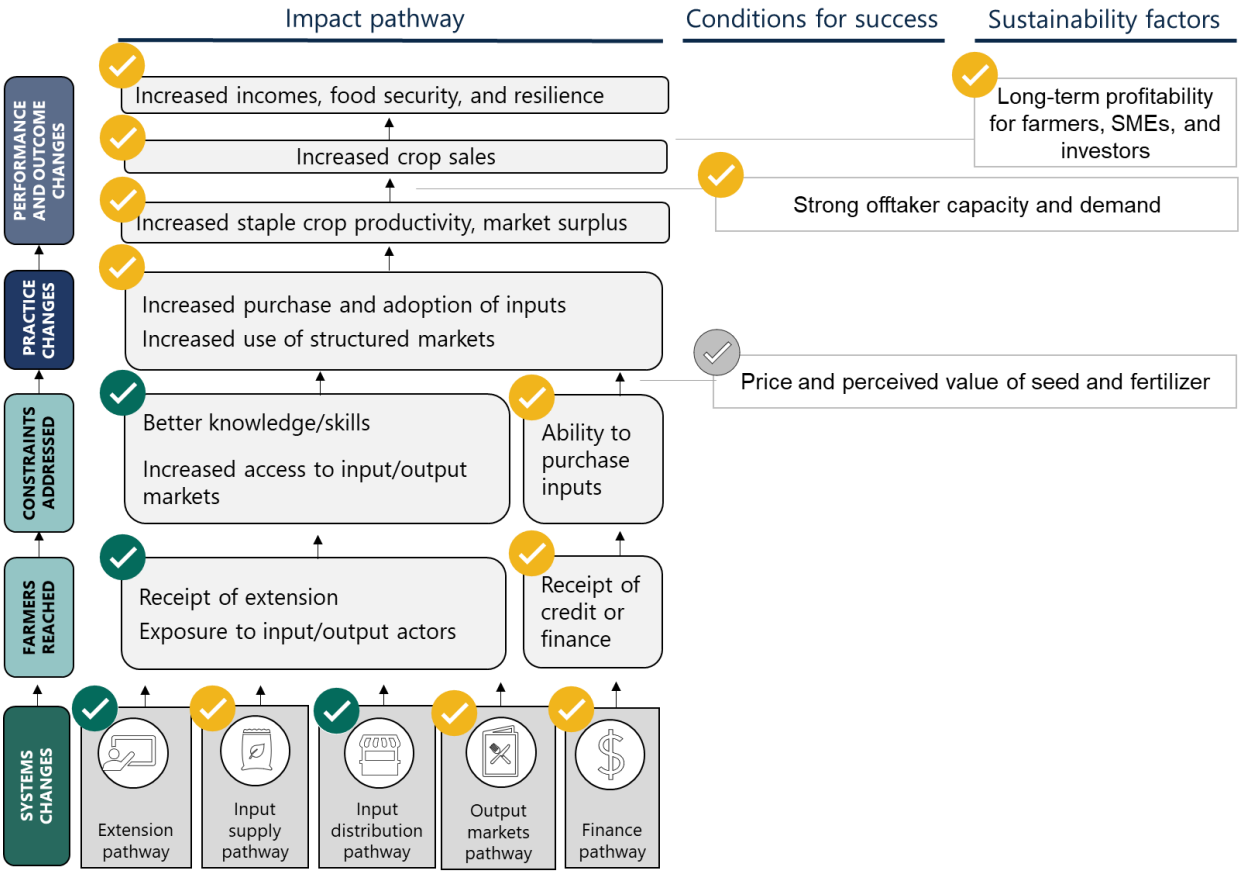
Exhibit 21. Evaluation questions on farmer outcomes

Primary questions:
• What evidence is there that AGRA's work has achieved its vision of catalyzing transformation for smallholder households in Africa? • How has PIATA contributed to farmer productivity, food security, and income across the 11 focus countries?
Secondary questions:
• How is AGRA's work catalyzing technology adoption? • Has PIATA helped increase smallholder farmers' access to finance? • How is AGRA's work contributing to increasing productivity, food security, and income?

Key evaluation findings

PIATA increased farmers' access to extension and seed, but it had mixed impacts on farmers' uptake of inputs, crop yields, sales, incomes, food security, and resilience. Rigorous analyses of farmer-level data show that PIATA's efforts in identifying and training VBAs and supporting extension systems significantly increased farmers' access to extension. However, PIATA's impact on farmer-level outcomes—adoption of inputs, yields, sales, food security, and resilience—is mixed. These mixed results likely reflect remaining farmer constraints in access to extension, seeds and fertilizer on credit, and profitable output markets. The evidence for AGRA's farmer-facing interventions having driven agricultural transformation—whereby smallholder farmers transition from subsistence farming into commercial farming—is weak and inconsistent. Despite these disappointing overarching results, there are notable successes. Smallholders increased maize yields in Ethiopia, Nigeria, and Ghana; and farmers in Burkina Faso experienced increased maize sales. The extent to which farmers can sustain these positive outcomes in future years depends heavily on the cost of improved inputs, continued off-taker demand, and the profitability of transactions for farmers and off-takers (see Exhibit 22).

Exhibit 22. Evaluation findings along the farmer impact ToC



Farmers who received PIATA-funded services tended to be men who cultivated maize and rice. Based on data from the seven focus countries covered in the latest round of the AGRA farmer outcome survey, just under 10 percent of targeted farmers lived in female-headed households, with considerable variation across focus countries (ranging from nearly 30 percent in Rwanda to less than 2 percent in Mali). The average targeted household reported owning approximately 5.4 hectares of land in 2020, of which 3.1 hectares were cultivated. Maize was the most widely cultivated crop, with over half of targeted farmers across seven focus countries reporting having cultivated it in the most recent growing season. Other important crops included rice (28 percent), cowpea (13 percent), and soybean (9 percent). However, unlike maize, which was cultivated by targeted farmers in all covered focus countries, cultivation of other crops was relatively less widespread and often restricted to specific countries.

Targeted farmers are located along a continuum from subsistence to more commercialized operations. Around 45 percent of farmers reported no maize sales whatsoever, suggesting a subsistence profile for nearly half of targeted farmers. At the other end of the spectrum, a minority of relatively high-resource farmers are responsible for the majority of maize sales among targeted farmers. These patterns were closely correlated with the use of agricultural inputs. For instance, only about one-fourth of targeted farmers who cultivated maize reported hiring external laborers to assist with maize planting. On average,

these same farmers also reported selling over 600 kg more maize in the most recent season than farmers who did not hire external help.

AGRA's support to VBAs and extension systems has increased farmers' access to extension services and input providers. In three out of the four countries for which data were available, quantitative analyses revealed large, positive, and consistent increases in access to extension among smallholder farmers targeted by AGRA's farmer facing interventions (Exhibit 23). In focus group discussions in Kenya, Tanzania, Ethiopia, Mozambique, and Ghana, farmers widely reported that VBAs and extension agents provided them with much-needed advice on planting improved seeds, applying fertilizer and chemicals, weeding, and storage (see Exhibit 25). Taken together, this suggests that AGRA's effort to improve smallholder farmers' access to better extension—and, in turn, knowledge of improved farming practices—has generally been successful across multiple countries. In these same settings, quantitative analysis found that increased uptake of extension services was accompanied by greater access to intermediary agro-dealers, as evidenced by a reduction in the smallholder farmers' reported distance to the nearest input supplier (see Appendix E in Volume II for more detailed findings). This is a notable achievement in enhancing farmers' last-mile access to inputs.

"With the coming of VBAs, we were able to understand that not all hybrids are appropriate for us…demo plots and sample packs have worked well."
—Farmer, Tanzania

Exhibit 7. AGRA's impacts on farmer outcomes across countries

Comparison group	Country	Extension receipt	Improved seeds	Inorganic fertilizer	Formal financial services	Crop production or yield	Food insecurity	Crop sales	Self-perceived resilience
Farmers in non-AGRA districts	Ethiopia					60%			
	Ghana					8%			
	Kenya					31%			
	Tanzania	65%	-53%	23%		70%			
Non-targeted farmers in the same districts	Burkina Faso	42%	13%	-18%	45%	-11%	0.3%	58%	-10%
	Ghana	48%	18%	11%	1%	6%	5%	-7%	-3%
	Nigeria	177%	56%	-0.2%	16%	14%	19%	-3%	11%

Notes: Results with the comparison group of "Farmers in non-AGRA districts" are derived from dynamic difference-in-differences analyses, and present estimates relative to mean pre-Phase 1 (pre-2008) levels or relative to levels in the earliest available year. Results with the comparison group of "Non-targeted farmers in the same districts" are derived from matched-comparison analyses, and present findings relative to levels among comparison farmers. "Crop production/yield" results refer to maize. Red and green text indicates statistically significant estimates; yellow text indicates statistically insignificant results.

Estimates should be interpreted in the following way: In Ethiopia, farmers in AGRA regions had, on average, yields that were *60 percent higher than* those of farmers in non-AGRA regions (as opposed to 60 percentage points higher).

AGRA increased some farmers' use of formal financial services, but stakeholders noted severe farmer credit constraints. A potential explanation for the inconsistent take-up of critical inputs could be farmers' finance or credit constraints. In Nigeria, AGRA worked with finance institutions to establish community branches in Niger and Kaduna states where consortia were active. Quantitative results suggest that these efforts paid off in the form of positive impacts on farmers' credit access (see Exhibit 23).[4] Farmers also reported increased access to formal financial services in Burkina Faso, despite a lack of farmer-focused inclusive finance investments in the country. However, farmers in Ghana registered no positive impacts in access to formal financial services despite AGRA's blended finance investments. In focus groups and interviews in Mozambique, Ethiopia, Kenya, Ghana, and Tanzania, farmers and AGRA partners cited a lack of collateral, few connections with lenders, high interest rates, and loan conditions that do not suit the agriculture cycle as primary obstacles to farmer credit. Unfortunately, inputs-on-credit arrangements are reported by fewer than 5 percent of farmers (AGRA Geopoll 2020). Such arrangements are a critical mechanism for farmers to maximize their land and labor productivity, without running the risk of losing collateral through formal credit.

> **"In the linkages with commercial banks, we did not succeed because of the high interest rates. At the level of producers very little has been done, financial institutions have been intervening in the region, but the products still do not meet the needs of smallholder farmers."**
>
> ***–AGRA partner in Mozambique***

PIATA's farmer-facing interventions had modest impacts on farmers' adoption of improved inputs. Impact analyses that compare farmers in targeted districts to farmers in non-targeted districts in Tanzania reveal no significant positive impact of PIATA on farmers' adoption of improved seeds or inorganic fertilizer. Matched-comparison analyses of data from the most recent round of AGRA's farmer outcome survey suggest that PIATA increased farmers' adoption of improved seeds in Nigeria and use of inorganic fertilizer in Ghana, but did not influence farmers' adoption of seeds or fertilizer in Burkina Faso. Overall, PIATA had a positive impact on only two of eight measures of farmers' adoption of improved inputs across the four countries for which data were available.

PIATA's farmer-facing interventions led to increased productivity in two of six countries: Ethiopia and Nigeria. Difference-in-differences analyses of subnational data on maize productivity over time indicate that maize yields increased dramatically in regions of Ethiopia targeted by AGRA's farmer-facing interventions during Phase 2 (see Exhibit 23). Similar analyses for Ghana, Kenya, and Tanzania, however, reveal no positive results with respect to yields.[5] Matched-comparison analyses of data from the most recent round of AGRA's farmer outcome survey suggest that AGRA increased targeted farmers' maize productivity in Nigeria but had no impact on maize yields among targeted farmers in Burkina Faso and Ghana, even though targeted farmers in all three countries report consistently higher access to extension relative to comparison farmers.

Farmers who adopted improved inputs and experienced yield increases were typically younger, male, and relatively wealthier. In particular, male farmers with larger dwellings, access to electricity,

[4] Formal credit for smallholders through finance institutions is not an end goal in itself, as access to inputs through any means is sufficient—including getting inputs on credit from VBAs or agro-dealers. However, positive impacts on farmers' finance in Burkina Faso and Nigeria suggest farmers can better access much-needed inputs in a timely manner.

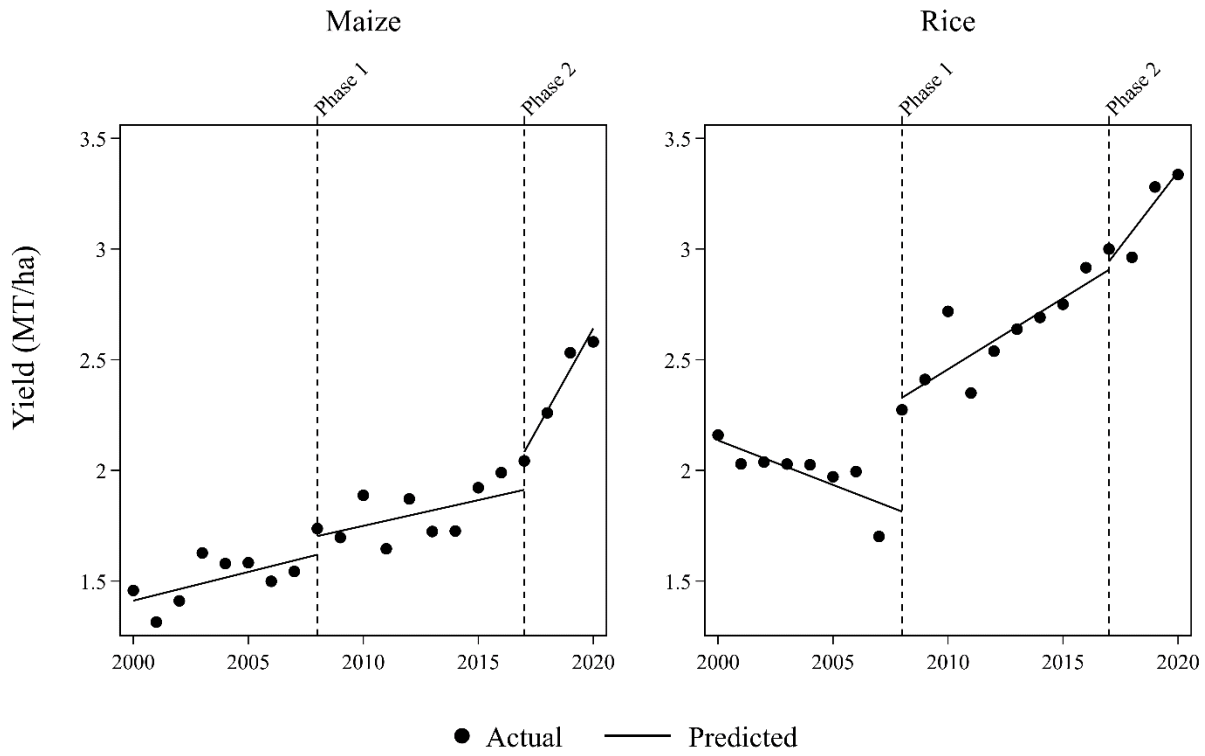
[5] In focus groups, farmers in Tanzania reported increased maize productivity—see Exhibit 25—whereas quantitative impact analysis did not detect increased maize yields. This discrepancy between qualitative and quantitative findings likely reflect the non-representative nature of qualitative samples.

greater total landholdings, and lower rates of disability were more likely to adopt improved maize varieties and inorganic fertilizer, and engage with extension services. Given the strong positive relationship between the use of improved inputs and crop yields and sales (as shown in Exhibit E.13 in Volume II), productivity and income gains were also concentrated among these relatively high-resource farmers. These more commercial farmers' high rates of adoption and related yield increases likely reflect their greater ability to experiment, their greater access to technology and extension, and their greater access to finance or credit vis-à-vis subsistence farmers.

PIATA likely increased national maize yields through the PFJ maize flagship, although the same cannot be said for the PFJ rice flagship. An interrupted time series analysis applied to two decades of data on annual maize yields from Ghana's Ministry of Agriculture provides suggestive evidence that the launch of Phase 2 of PIATA was associated with an increase in the level and growth rate of national maize productivity. This likely reflects the positive impact of the PFJ maize flagship—particularly its input subsidies—on productivity (Exhibit 24). Because AGRA designed the overarching PFJ framework and implemented maize-focused consortia, these productivity boosts can be attributed in part to AGRA. However, rice yields in Ghana had no significant increase in productivity from 2017 to 2020, despite large investments in rice inputs, extension, and output markets through AGRA's PFJ rice consortium.[6] National trends in rice productivity should be monitored closely in future years, as data indicate a potential upward trend in rice yields since 2017. Because this upward trend is not statistically significant, however, we cannot conclude that rice yields increased from 2017 to 2020, nor that AGRA played a decisive role in any increases.

[6] A replication of the interrupted time series analysis using annual data on maize and rice production between 1985 and 2019 in Tanzania suggests that the launch of Phase 2 is associated with a downturn in agricultural performance (see Appendix E in Volume II). However, this likely reflects the detrimental effects of other, coincident factors. In particular, severe drought-like conditions that affected the East Africa region between 2015 and 2017 are likely to have dampened national agricultural performance. The overall agricultural sector may have further been constrained by restrictions imposed on food exports by the Tanzanian government in 2017.

Exhibit 24. Influence of AGRA's national-level interventions on crop yields in Ghana



Notes: This figure summarizes the results of interrupted time series analyses using annual data on national maize and rice yields in Ghana between 2000 and 2020. See Appendix E in Volume II for additional details.

Farmer impacts on maize productivity occur in countries with large AGRA investment in inputs and extension. The three countries that registered positive impacts on maize productivity at the regional or national level—Ethiopia, Nigeria, and Ghana—featured AGRA's largest investments in inputs and extension of the full set of six countries for which data were available. AGRA spent between $7 million and $10 million on inputs and extension in these three countries, versus between $3 million and $4.5 million in the three countries that registered no impact on maize productivity: Tanzania, Kenya, and Burkina Faso. This suggests that AGRA can indeed improve farmers' productivity in its designated "push" countries through substantive investments in inputs and extension. Potentially there is a minimum threshold of per-farmer investment required to produce the productivity gains seen in Ethiopia, Nigeria, and Ghana. This minimum threshold of investment is the sum of AGRA's direct contributions through grants, as well as complementary investments from public and private partners.

Lack of widespread impacts on yields may point to remaining farmer constraints in four areas. These mixed results suggest that AGRA is still not addressing farmers' most binding constraints to enhanced production. Notably, of the three countries where comprehensive data were available—Burkina Faso, Ghana, and Nigeria—only AGRA-supported farmers in Nigeria experienced all four of the following critical drivers of productivity: (1) increased or widespread use of improved seed, (2) increased or widespread use of fertilizer, (3) increased or widespread receipt of extension, and (4) increased or widespread access to credit or finance. Perhaps for this reason, Nigeria was the only country that

registered large positive impacts in farmer productivity.[7] Notably, no more than 45 percent of farmers targeted by AGRA reported receiving extension in the past year in Burkina Faso and Ghana, compared to 61 percent of treatment farmers in Nigeria. This may point to potential for AGRA and other system actors to generate more widespread productivity gains through scaled-up extension efforts across focus countries.

AGRA's farmer-facing work led to increased sales in one of three countries. In Burkina Faso, AGRA spent $9 million to build farmer group capacity and secure structured markets. This large investment in output markets relative to other countries appears to have paid dividends, as Burkina Faso is the only country registering a positive impact on maize sales among the three AGRA countries with relevant data. In Ghana and Nigeria, AGRA invested $0.7 million and $1 million in output markets, respectively—much less than in Burkina Faso. Consistent with these lower rates of investment, matched-comparison analyses using data from these two countries reveal no increase in reported crop sales among targeted farmers relative to comparison farmers.

There is limited rigorous evidence of AGRA's positive impact on food security and resilience, despite the more positive story from fieldwork. During focus groups and interviews, farmers, VBAs and agro-dealers in Tanzania, Mozambique, Kenya, and Ethiopia agreed that farmers' income and food security had increased due to productivity gains tied to AGRA's extension and input investments. In Kenya and Tanzania, in particular, this increased food security is reportedly linked to higher maize production that farmers now safely store in hermetically sealed bags. Our impact analyses using representative data from the most recent round of AGRA's farmer outcome survey in Burkina Faso, Ghana, and Nigeria found no positive impact of AGRA's farmer-facing work on farmer food security and resilience. This is surprising, particularly for Nigeria, where we did find an improvement in maize yields. Unfortunately, survey data on sales, income, and food security were not available for Tanzania, Kenya, Ethiopia, and Mozambique. As such, it is not possible to assess the extent to which outcomes reported in farmer focus groups occurred across the full target population. (Exhibit 25 presents firsthand farmer accounts of AGRA investments, as well as commercial outcomes and household wellbeing.)

Exhibit 25. Firsthand farmer accounts of extension, finance, inputs, and agriculture outcomes

Topic	Quote
VBAs	• 'With the coming of VBAs we were able to understand that not all hybrids are appropriate for us. VBAs came with demo plots and sample packs and this has worked well.' (Tanzania)
Finance	• 'People used to give us loans to farm, but these people are no more; they've been sacked.' (Ghana) • 'To get a loan you need collateral that we don't have.' (Tanzania)
Improved seeds	• 'We buy maize seeds from the agro-dealers…we select the seeds that have done well in the demo plots.' (Tanzania)
Fertilizer	• 'In our community when you cultivate maize our main challenge is the fertilizer. It is very difficult to get here.' (Ghana) • '[Agro-dealer] capital is too small to stock enough fertilizer.' (Tanzania)
GAP	• '[We use] better practices like use of the right seed rate and spacing.' (Kenya) • 'We weed twice instead of one time.' (Ghana)

[7] Ethiopia also registered large positive impacts on productivity, but data on these four drivers of productivity are unavailable for Ethiopia.

Topic	Quote
Productivity	• 'Maize production is way up. We used to get 2 to 4 bags of maize [per] acre, but now we are getting between 15 to 20 bags of maize on the same acre.' (Tanzania) • 'In the past [we] grew about 5.5 tons per hectare of wheat. Now the productivity has increased to 7.0 tons per hectare.' (Ethiopia)
Sales and income	• 'We were told [by consortium partners] we would be linked with buyers… but we have not seen that happening.' (Tanzania) • 'Some people come with trucks or vehicles to buy our produce at a relatively low price immediately after harvest…due to urgent need for money we sell [to] them like that.' (Ghana)
Food security	• 'More production means we do not miss meals.' (Kenya) • 'In [previous] years, by July, there was no more food in the household, but now we have food for the whole year.' (Tanzania)

4. Overarching Findings

In this section, we reflect on overarching findings around AGRA's implementation strategy, its unintended impacts, its gender and youth strategy, and its M&E work. Specifically, we answer three cross-cutting questions on AGRA's work (see Exhibit 26).

Exhibit 26. Overarching evaluation questions

Primary question:
• How did interventions work interdependently to achieve outcomes? Which models are most likely to scale and why?
Secondary questions:
• Were there any unintended consequences of AGRA's work—either positive or negative? • To what extent was AGRA successful in prioritizing inclusion, developing approaches, and achieving outcomes with respect to gender, ethnicity, youth, etc.

Below, we describe the core evaluation findings.

AGRA created strong synergies between and within policy and systems development work. In Rwanda, Ethiopia, and other countries, seed policy reform incentivized private sector entry into certified seed production. Leveraging this improved investment climate, AGRA made a series of targeted investments in seed companies and outgrowers that resulted in enhanced seed production and increased farmer access to improved seeds. Similarly, AGRA's efforts to address fertilizer subsidies in Kenya encouraged private sector engagement in fertilizer distribution. In Kenya, Ghana, and other countries, AGRA also created strong linkages between input supply, input distribution, and extension systems. Importantly, AGRA-trained VBAs and agro-dealers delivered AGRA-financed seeds directly to farmers and provided them with appropriate guidance. Through this chain of complementary upstream and downstream investments, AGRA helped incentivize the production, distribution, and adoption of high quality, certified seed.

There is still untapped potential for synergies across AGRA's thematic areas, particularly in the areas of output market access and input finance. More synergies are needed between partnerships and systems development for PIATA to truly become greater than the sum of its parts. In particular, there may be untapped potential to link farmers with reliable output markets through new partnerships with national and regional SMEs. In addition, this evaluation found that access to credit is a critical remaining

constraint to transformation, particularly with respect to (1) a lack of formal or informal credit for input suppliers such as seed companies and (hub) agro-dealers, and (2) a lack of inputs-on-credit arrangements for smallholders. Tackling these issues likely may involve more strongly integrating AGRA's inclusive finance work into consortia models in future years, as well as developing even stronger partnerships with national and regional input suppliers.

Despite AGRA's positive momentum, key constraints to farmer adoption persist. Our impact analyses suggest that farmers across AGRA's focus countries still have limited adoption of improved seeds and fertilizer, which translates to limited yields. Particularly worrisome is that adoption and yield gains appear concentrated among relatively well-resourced commercial farmers, who tend to be male farmers with greater total landholdings. Credit or finance constraints likely limit less-resourced farmers' adoption of inputs. Another concern is that, although we find positive impacts of AGRA's farmer-facing work on extension, these impacts may not be large enough in magnitude to generate adoption among targeted farmers. Between 40 and 61 percent of targeted farmers reported an extension visit in the last year—well below AGRA's internal target of 85 percent. This likely reflects AGRA's relatively low per-farmer investment of around $10 per farmer, as well as the fact that public extension systems are generally weak and cannot be leveraged except in a small set of countries.

Although AGRA's gender, youth, and inclusion work is still new, they have made good progress on a gender strategy. AGRA's history with gender and inclusion is relatively short. Starting in Phase 2, AGRA has become more intentional about gender, youth, and inclusion. This has occurred through explicit programs like flagships, as well as efforts to begin training staff and grantees on gender-responsive principles. AGRA's gender work currently seems to be operating on three tiers, likely reflecting its transition to more gender-intentional work (see Exhibit 27). The first tier has no gender, youth, or inclusion goals. The second tier has gender and inclusion targets (with no strong consideration of women- and youth-specific constraints or how to address them). This seems to be the case with most consortia work that began in 2017 and 2018. The third tier features intentional diversity, equity, and inclusion programming. This involves some upfront assessment of women's and youth's constraints, as well as active engagement with women and youth about potential solutions. Only a small percentage of AGRA programs—such as VALUE4HER—are operating in this tier. A worthy goal for AGRA would be to transition as much of its state capability, partnerships, and systems development work into this third tier of inclusive programming as possible during its next phase of work.

Exhibit 27. AGRA's tiered approach to gender

Tier	Illustrative quote
Tier 1: No consideration	• *"*Our program encouraged both male and female farmers alike." —Partner in Nigeria
Tier 2: Inclusion goals	• "We target women for 40% of the farmers." —Partner in Ethiopia
Tier 3: Inclusive programming	• "Women agro-dealers in the male dominated areas receive special support." —Partner in Ghana

Among unintended impacts, AGRA's assistance may have created some market distortions and system-wide effects. Stakeholders generally did not bring up unintended consequences of AGRA's work, either negative or positive. Some stakeholders noted that, in Ghana, the intervention may have contributed

to farmers' unwillingness to purchase fertilizers at market prices as well as input dealers' unwillingness to buy and sell fertilizers—thus producing localized fertilizer shortages. In Ghana, as farmers are becoming more successful in production, demand for agrochemicals has increased. This has led to a shortage of agrochemicals in some locales. However, unanticipated and unfavorable market- and system-level distortions appear relatively rare across AGRA's 11 focus countries.

VBA and consortia have potential for scale, but only under specific conditions. In Phase 2, AGRA made strong efforts to scale its VBA and consortia models across multiple countries. Although the evaluation found that overall VBA and consortia investments did not drive adoption and improved productivity, some promising versions of these models are emerging. For example, there is promise in the fully business-led consortium orchestrated by a capable buyer. One example of this is the Smallholder Inclusive Productivity and Market Access (SIPMA) consortium in Ghana, led by Yedent Agro Group, an established maize and soybean processor. These business-led consortia appear successful only when buyers are fully committed to some degree of backward integration, and farmer choice is not constrained by such arrangements. There is also promise in a highly commercial version of the VBA model, but only when the existing ecosystem of processors, traders, and buyers can support VBA involvement in input sales and aggregation (as in some consortia in Mozambique), and distances and financial constraints do not preclude VBA profits. Lastly, a public version of the VBA model is also viable, whereby extension authorities support, retrain, and replace VBAs as needed. Ironically, this public version of VBAs may be viable only in those few countries with relatively strong public extension systems. (Extension systems must be well-resourced to support and maintain VBAs year-on-year). AGRA leadership and technical staff could keep these conditions in mind as they further refine and scale consortia and VBA models in the next strategy.

In conducting this evaluation, we drew heavily on AGRA's monitoring systems and various surveys. We summarize our insights from studying these data sources in depth.

AGRA's MEL system is burdensome and appears to favor accountability over learning. AGRA's sizable MEL resources and engagement in multiple countries provide a rich opportunity to rigorously assess impact, surface best practices and lessons learned, and refine models before moving to scale-up. However, AGRA currently lacks a focused learning agenda to explore these topics. AGRA's MEL system is also structured to serve (backward-looking) accountability goals over (forward-looking) learning and strategy goals to support decision making. Given this lack of focus and preference for accountability, AGRA requires grantees to upload a large set of quantitative outputs and outcomes into the AGRA Management Information System (AMIS), resulting in undue grantee burden. Many grantee-reported outcomes in AMIS also have dubious validity, as they require grantees to estimate a counterfactual that is not feasible (such as levels of investment or sales in the absence of AGRA). In addition, narrative report templates do not call grantees to provide needed context for quantitative indicators or engage with basic ToC elements such as linkages between activities and outcomes, conditions of success, and sustainability factors. As a result, AMIS reporting is more of an administrative exercise than an opportunity for grantee reflection and AGRA learning. However, AMIS's standardized indicators allow quantitative outputs to be aggregated and reported at the country and portfolio levels. This is commendable, as it allows for insightful comparisons and real-time monitoring against output targets (see Exhibit 28).

AGRA surveys are currently not suited for rigorous impact analysis. AGRA relies on a series of in-person farmer outcome surveys and Geopoll phone surveys to estimate the impact of its work on farmers. However, farmer outcome surveys sampled both treatment and comparison farmers in only three focus countries from 2017 to 2021, and outcome surveys commonly feature no baseline data collection—only

endline. These two factors greatly limit the utility of AGRA farmer outcome surveys for rigorous impact analysis. AGRA's Geopoll phone survey provides a snapshot of farmer, agro-dealer, and VBA activities, needs, and outcomes. The Geopoll is currently used to assess and report on AGRA's farmer impact (as in AGRA's recent public report, Emerging Results: 2017–2020). The phone survey asks farmers to recall activities and outcomes from several years prior to the survey date. The Geopoll's absence of a valid comparison group—combined with its strong reliance on farmers' recall from previous years—is likely to produce biased estimates of AGRA's impact. AGRA's VBA-administered farmer surveys use a similar methodology, also likely resulting in biased estimates of impact (see Exhibit 28).

Exhibit 28. AGRA data collection tools

Data source	Description	Advantages	Disadvantages
AGRA monitoring system (AMIS)	Online database that grantees access directly to enter quantitative outputs/outcomes and upload narrative reports	• Quantitative outputs can be aggregated at the country and portfolio levels through standard indicators	• Large number of indicators is burdensome for grantees to report • Grantee narratives rarely provide insight on ToCs, including whether binding constraints have been addressed, how system actors have changed, or why changes have or have not occurred
Geopoll phone survey	Phone survey of farmers, VBAs, agro-dealers, and seed companies	• Provides a snapshot of stakeholder activities, outcomes, and constraints that can be leveraged for decision making • Most representative sample of VBAs and SMEs targeted by AGRA	• Not suited to rigorously measure AGRA's impact given recall-based pre-post comparisons with no comparison group
VBA-administered survey of farmers	In-person survey in which VBAs ask the farmers they serve about their practices and outcomes	• Leverages VBA-farmer relationships to capture detailed information on farmer practices and outcomes	• Not suited to rigorously measure AGRA's impact given pre-post comparisons with no comparison group • VBA role in selecting and interviewing farmers is inherently biased • Several data quality issues exist related to lack of skip patterns, agricultural units, and enumerator identification numbers
Farmer outcome survey	In-person survey of farmers to capture their agricultural practices and outcomes, as well as household welfare	• Can be leveraged for rigorous impact analysis when comparison farmers are sampled, and baselines are conducted	• Comparison groups were available for only 3 of 11 AGRA focus countries at the time of AGRA 2.0 endline evaluation, and lack of baselines required several assumptions for impact analysis

5. Strategic Recommendations

Based on the evaluation findings, we have the following strategic recommendations for the next phase of PIATA's work.

More fully leverage synergies and relationships to meet farmers' binding constraints. This evaluation suggests that AGRA is addressing some, but not all farmers' binding constraints to agricultural transformation. Of these constraints, affordable inputs (through credit arrangements) and output markets are perhaps the most difficult to unlock. AGRA and partners could increase its potential for farmer impact by more robustly assessing farmer and SME constraints at the outset in target geographies and commodities, and formulating tailored interventions to address them. Given AGRA's catalytic and synergistic approach, these tailored interventions will likely require stronger integration of financial institutions, (hub) agro-dealers, and buyers into consortia from the outset, and even tighter integration between AGRA's policy and systems development teams in each focus country. Given current extension rates of less than 50 percent in most focus countries, AGRA should also seek to leverage government systems and other donors to boost extension access throughout consortia. Increasing extension efforts and leveraging public and private funding could help meet minimum thresholds of per-farmer investment that likely produced productivity gains seen in Ethiopia, Nigeria, and Ghana.

Develop a sustainability, scaling, and exit strategy for all key areas of work. The success of AGRA's VBA, consortia, and partnership work depends on its ability to identify, develop, and implement approaches that make it profitable for market system actors to engage smallholder farmers without external support. Our findings suggest that private sector partners and VBAs do not always find profitable models to engage with farmers. (This is to be expected given the inherent challenge of agricultural transformation.) We recommend that AGRA teams regularly assess their active partnership and consortia portfolios, and identify those activities that are unlikely to be profitable once initial funding is exhausted. Where profitability has not emerged and public funding may be necessary, AGRA can attempt to galvanize public or donor support before project close-out. Where private-led approaches do not reach break-even or public funding is not secured by a defined deadline, AGRA should exit those programs to conserve scarce resources. (See Exhibit 29 for specific recommendations on scaling and exiting.)

Exhibit 29. Specific recommendations on scaling and exit strategies

Thematic area	Continue or Scale	Exit or Disinvest
Policy	Accelerate policy reforms that can lead to transformative change without requiring burdensome implementation and maintenance from the government. For example, reforming policies (i.e., taxes on imports and inputs) that impede private sector investment can yield large benefits with little follow-up. Identify ways to accelerate the timeline from initial policy engagement to successful private sector production, particularly in seed systems.	Disengage with policy reforms that require government investment and planning that are not guaranteed or require other efforts, which AGRA cannot influence, to succeed before generating desired outcomes.

Thematic area	Continue or Scale	Exit or Disinvest
State capability	Continue flagships that (1) engage private sector sustainably, (2) are not supported by distortionary subsidies, and (3) have strong civil society support.	Forego flagships that (1) do not appear to have a strong business case for key private partners, or (2) lack prospects for sustained activities and benefits once public and donor funding is exhausted.
Partnerships	Scale up partnerships where AGRA's engagement addresses private sector constraints to working in target geographies and with target farmers, focusing on SME and MSMEs (more so than large multinational corporations).	Exit from partnerships that are unlikely to survive without external support by a predetermined trial period, based upon an analysis of break-even timelines for similar business models.
VBAs	Scale-up VBAs in contexts where they can either be successful through a private-led approach or thrive through public support. VBAs that (1) have an entrepreneurial spirit, (2) are located near developed input/output markets, (3) have access to a critical mass of farmers, and (4) have options to layer multiple income streams are more likely to succeed through a private-led approach.	Disinvest in VBAs where there is a low likelihood for public support and VBAs have not secured income streams that fairly compensate them for their time.
Consortia	Scale up consortia that appear to be meeting farmers' binding constraints to productivity and sales, particularly with respect to access to extension, improved inputs, and output markets. Explore building upon the "empowered off-taker as key consortium member" model as in the Smallholder Inclusive Productivity and Market Access (SIPMA) consortium in Ghana.	Exit from consortia where AGRA's efforts, combined with those of other partners, are still unlikely to address farmers' binding constraints to productivity and sales. Consortia that fail to meet a 60% extension coverage rate by Year 3 could be candidates for exit. Exit from NGO-led consortia that have not generated desired levels of extension, adoption, and productivity by a cutoff date.

More deeply engage with and empower civil society and smallholders. Building upon its commendable stakeholder consultation work in Phase 2, AGRA should engage with civil society and smallholders more deeply and even earlier in the policymaking and flagship development process. This higher level of civil society engagement in formative discussion could increase ownership of development programs and feasibly lead to greater public investment in crop diversification, better nutritional outcomes, and increased farmer capacity for entrepreneurial and welfare-maximizing activity. In addition, supporting the capacity of civil society and farmer groups to organize and speak with one voice—outside of specific policy reforms—could bolster their ability to lobby governments for more inclusive reforms in a credible manner.

Consider targeted capacity-building efforts while staying the course with results-oriented policy reforms. AGRA has shown technical expertise in delivering high quality and credible technical and financial support to accelerate policy reform processes. AGRA staff have also built strong relationships with governments and earned the trust of government partners in policy reform development and implementation. AGRA should leverage this expertise and credibility to continue its current 'results-

oriented' focus on immediate reforms in focus countries—targeting those reforms that feature the strongest synergies with AGRA's systems development work. To complement this results-oriented work, AGRA should enhance longer-term public capacity in policy analysis and development in a smaller set of countries with favorable conditions for retaining this capacity, including relatively apolitical agriculture ministries with permanent financial resources and low staff turnover. Capacity building in these countries could feature structured training and coaching supports, as well international learning exchanges.

Develop criteria to identify and prioritize flagships that have potential for agricultural transformation. AGRA largely follows countries' vision for flagships, even to the point of upholding inconsistent principles across countries. For example, AGRA supported flagships that involved highly targeted subsidies through the Planting for Food and Jobs flagship in Ghana, but it supported flagships that involved less targeted (and thus less distortionary) e-vouchers for seed and fertilizer in Kenya. To reduce these inconsistencies across countries and reinforce its own vision of agricultural transformation, we suggest that AGRA develop clear criteria to assess, prioritize, and influence flagships across countries. This could include general criteria related to flagships' concrete alignment with the nine articles of the Malabo Declaration, as well as topic-specific criteria (such as the efficiency of proposed input subsidies). Developing these criteria could enable AGRA to more critically assess government-proposed flagships and suggest changes that can make flagships even more transformative.

Become a more learning-focused organization with less burdensome grantee reporting and more rigorous farmer surveys. AGRA should consider convening its leadership, technical, and M&E staff to set a focused learning agenda grounded in its major evidence and decision-making needs for the next strategy. A more focused agenda could help determine changes in farmer outcome survey fielding, sampling, and timing that would be needed to more rigorously measure AGRA's farmer impact in the next strategy. A more focused agenda could also help streamline grantee reporting requirements to a minimal set of indicators.

Specifically, AGRA could consider the following recommendations:

1. Develop a focused learning agenda that balances goals of (1) accountability, (2) learning for midcourse corrections, and (3) learning for strategy decisions (such as scale-up versus exit).

2. Streamline output and outcome indicators along AGRA's ToCs using the learning agenda as a basis. Indicators that do not align with the learning agenda can be dropped. Key outcome indicators that cannot be measured by grantees in a valid way (such as sales or farmer adoption attributed to AGRA) can be moved from grantee reporting to AGRA M&E staff or evaluator reporting.

3. Structure and store grantee narrative reports in a way that allows M&E and technical staff to more easily search, extract, and compare qualitative insights across countries and thematic areas. These qualitative insights are critical to contextualize quantitative indicators and identify best practices, lessons learned, and promising models.

4. For farmer-focused interventions: Reserve rigorous impact evaluation for a small set of interventions that: (1) involve promising new models or proven models being implemented in new contexts, (2) have a clear ToC and definition of success, and (3) have a clearly defined geographical focus. Rigorous impact evaluation must include valid comparison groups (and baseline surveys, if possible).

5. For interventions that are not farmer-focused: Define success and related results indicators at project kick-off that go beyond outputs (e.g., increase in trade of specific crops rather than number of policy reforms passed related to trade). Identify a timeline that is reasonable to expect outcomes and measure success.
6. For all interventions: Measure interim and final results when they are expected to mature, regardless of project close-out dates. This implies measuring results after project close-out for policy reforms and consortia, given the longer timelines required to generate desired results in these programs.
7. For all interventions: Build decision points and negative/positive thresholds into project cycles to prompt candid discussions on project continuation, scale-up, and exit—ideally at project midpoints and endpoints. At the outset of each project, AGRA could stipulate the negative interim and final results that should trigger discussions on exiting (such as adoption rates lower than 30 percent by year 2) versus the positive interim and final results that should trigger discussions on potential replication or scale-up (such as SME break-even by year 5).

Tackle critical issues facing agriculture in sub-Saharan Africa. AGRA already promotes climate-smart and drought-resistant crop varieties, which is highly commendable. However, its systems development work does not appear to fully account for farmers' poor access to irrigation and growing exposure to drought and other severe weather conditions. AGRA's next strategy should articulate these acute challenges and make more explicit investments in improving farmers' water use efficiency and climate resiliency. AGRA's next strategy could also formally recognize that agricultural technologies and practices—such as fertilizer use and rice cultivation—can negatively impact environmental conditions and greenhouse gas (GHG) emissions. In contrast, other agricultural technologies can help to reduce GHG emissions and store carbon across the landscape. Cognizant of these linkages, AGRA could make more explicit investments in eco-friendly technologies and practices among smallholders. As it develops the next set of country strategies, AGRA could also assess the environmental impact of its fertilizer recommendations, as well as the alignment of its full set of proposed investments with national pathways to net zero.

Expand gender and youth inclusion efforts. Only a small portion of AGRA's portfolio features intentional diversity, equity, and inclusion programming. To remedy this, AGRA should strive to infuse its systems development and state capability work with upfront assessments of women's and youth's constraints, active engagement with women and youth about potential solutions, and tailored supports for women and youth when feasible. AGRA should also bolster the nascent initiatives and platforms serving women and youth, such as VALUE4HER and Deal room, with strong emphasis on building viable in-country business models and sustainability plans.

References

AGRA. AGRA Emerging Results: 2017-2020. June 2021.

AGRA. Evaluation Report, Strategic Partnerships - Theme 2. PowerPoint Presentation, 2021.

AGRA. Geopoll phone surveys of SMEs, VBAs, and farmers. 2020 and 2021.

AGRA Program Performance Report Q4, 2020.

AGRA Strategic Partnerships presentation, 2021.

Collier, D. "Understanding Process Tracing." *Political Science & Politics,* vol. 44, no. 4, 2011, pp. 823–830. https://doi.org/10.1017/S1049096511001429

Punton, M., and K. Welle. *Applying Process Tracing in Five Steps.* Brighton: Centre for Development Impact, 2015.

Rossi, P.H, H.E. Freeman, and M.W. Lipsey. *Evaluation: A Systematic Approach,* 6th ed. Thousand Oaks, CA: Sage Publications, 1999.

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