



# FEED THE FUTURE

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



## MAXIMIZING AGRICULTURAL REVENUE AND KEY ENTERPRISES IN TARGETED SITES II

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# MAXIMIZING AGRICULTURAL REVENUE AND KEY ENTERPRISES IN TARGETED SITES II

**Cover photo:** Bala Muhammed operates a power tiller in Argungu, Kebbi state, which was provided under MARKETS II's grants portfolio. The project's agricultural mechanization grants included organizational and business capacity strengthening to increase productivity, expand land cultivation (where environmentally appropriate), improve farmer groups' business acumen, and boost the wider community's access to mechanization services, while decreasing costs and time for production and processing.

## DISCLAIMER

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# Acronyms

ADP	Agricultural Development Program
ATA	Agricultural Transformation Agenda
EA	extension agent
GES	Growth Enhancement Scheme
GPS	global position system
IA	implementation agreement
IDPs	internally displaced persons
LAPO	Lift Above Poverty Organization
LGA	local government area
MARKETS II	Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites II
MEF	Microenterprise Fundamentals
MFB	microfinance bank
NAEC	Nigerian Agriculture Enterprise Curriculum
NIRSAL	Nigeria Incentive-Based Risk Sharing System for Agricultural Lending
POP	package of practices
UDP	urea deep placement
USG	urea super granules

# Executive Summary

At the outset of the Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites II project (MARKETS II) in 2012, few Nigerian smallholder farmers believed that earning million-naira profits growing staple crops was a possibility.

“USAID MARKETS II has made millionaires.”

— RICE FARMER, KEBBI STATE

Nigeria’s agriculture sector is replete with paradoxes. It is the world’s largest producer of cowpea, cassava, and sorghum; second in maize; seventh in sesame; and 16th in rice. However, many rural Nigerians are food insecure during certain times of the year. Agriculture constitutes approximately 40 percent of the country’s gross domestic product and approximately 70 percent of Nigerians are engaged in agriculture, but 53.5 percent of the population lives below the income poverty line (with a purchasing power parity of \$1.90 a day). The country has enviable agricultural resources — including 100 million hectares of arable land; tremendous water resources through two major rivers; major seaports to access global trade; a sizable workforce; and the agro-climatic diversity to grow grains, fruits, nuts, spices, vegetables, and livestock — but these resources are not used as efficiently as possible.

The paradox of people going hungry in one of the world’s largest food-producing countries can be explained, in part, by the low esteem given to farming culturally, the lack of an agribusiness focus, and the unawareness of market demand and appropriate improved production methods. This leads to a low-risk semi-subsistence approach that uses low-cost traditional methods, resulting in yields and farmer income that are below potential. Nigeria’s standing as a global agriculture powerhouse is the result not of the quality of its agricultural production but of the sheer quantity of farmers in the country.

## MARKETS II SYNOPSIS

**Duration:** April 18, 2012, to October 15, 2017

**Budget:** \$64,932,079

### Implementing consortium:

- **Chemonics International.** Leads consortium and manages field implementation, monitoring and evaluation, grants, and subcontracts.
- **International Fertilizer Development Center.** Supports the improvement of farmers’ access to quality agro-inputs and adoption of more beneficial farm practices to increase productivity and return nutrients to depleted soils.
- **Making Cents International.** Supports the design and development of culturally appropriate agriculture and small agribusiness training curricula.
- **Enclude (formerly Shorebank International Ltd).** Supports the access to finance component and provides technical assistance to commercial banks to expand their agricultural financial products.
- **Winrock International.** Supports value chain development and dry-season drip-irrigation systems.
- **Diamond Development Initiative.** Supports out-grower schemes for sorghum and rice value chains under the project’s supervision.

If farming does not provide an adequate income to allow Nigerians to support themselves and their families, they will seek alternatives in non-rural areas. The combination of arduous manual labor, low incomes, and lack of social amenities also provide limited incentive for rural youth to remain on the farm, as demonstrated by the rate of youth urbanization. This presents a demographic challenge: if Nigeria's aging farmers are not replaced with younger men and women, the country faces real threats to its future food and societal security.

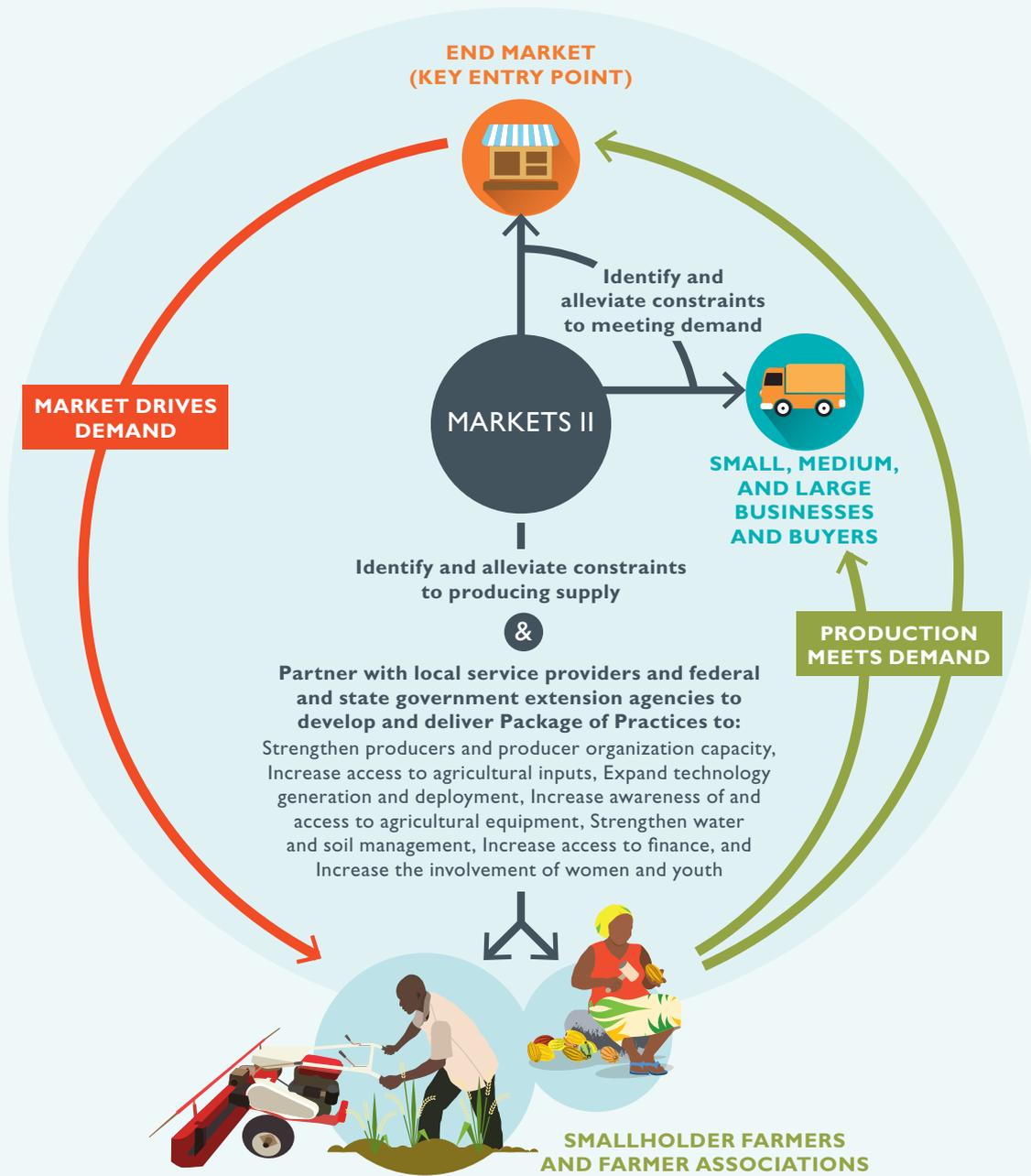
To address these issues, MARKETS II launched in April 2012 to promote sustainable agriculture development via increasing private sector participation and investment ("agricultural as a viable and profitable business"), raising income, increasing employment, attaining food security, and reducing poverty. MARKETS II supported the U.S. government's Feed the Future initiative, the government of Nigeria's Agricultural Transformation Agenda (ATA), and its succeeding Agriculture Promotion Policy 2016-2020 (also known as the Green Alternative).

Through a market-demand value chain orientation, the project focused on the large population of smallholders with between 1 to 5 hectares of land under cultivation, which make up the vast majority of all farmland in Nigeria. The project's systemic approach addressed limitations and opportunities in all of the value chain segments that could have an impact on the smallholder farmer's food security and income, as illustrated in the graphic on the following page.

The MARKETS II strategy involved marrying the short-term crop cycle vision with a focus on longer-term "win-win" business partnerships. MARKETS II served as the "honest broker" with processors, helping them to define their needed quality and quantity of raw materials, while also working through the value chain to assist smallholder farmers with meeting those requirements. In this way, MARKETS II's approach was demand-driven, and its efforts to orient farmers from selling what they produce toward producing what they could sell profitably — and knowing how much they actually made — helped to shift farmers' perspectives from agriculture as a means of subsisting to agriculture as a business. The project also helped processors see that smallholder farmers are reliable direct suppliers who play a long-term and important role in Nigerian agribusiness.

To help its beneficiary farmers produce to processors' specifications, MARKETS II supported the development of farmer associations and community extension agents (EAs) and mobilized public and private sector actors — including seed and fertilizer companies, farm implement providers, government EAs, and credit providers — to participate in project-sponsored training and capacity-building programs. Pre-season, in-season, and harvest/post-harvest training programs introduced farmers to the importance of using high-quality seeds, proper planting techniques, timely fertilizer application and irrigation scheduling, and harvest/post-harvest handling techniques. These techniques were presented in a "package of practices" (POP), an easy-to-understand and easy-to-apply set of procedures designed to ensure higher yields and higher product quality. The participation of input suppliers, EAs, and other value chain actors at training programs helped to surround farmers with the knowledge, skills, inputs, and tools necessary to succeed. Building the capacity of farmer associations via training and exchange visits has resulted in burgeoning small-scale rural agribusinesses selling services to members and the wider farming community.

A market-led, **DEMAND-DRIVEN APPROACH** of “produce what you can sell,” not “sell what you can produce,” which changes mindsets to realize “agriculture is a business” throughout the value chain.



**619,285\***

Unique individuals trained



**\$1,767,070,727**

Value of sales for  
MARKETS II commodities



**3,447,314 MT**

Volume of sales for  
MARKETS II commodities

\*For related FTF indicators see Annex A.

This training-centric congregation of value chain actors also created business opportunities for vendors of farming inputs and support services, and helped to ensure the sustainability of the MARKETS II approach by building a strong network along the links of the value chain.

In addition to private sector actors, MARKETS II grounded its approach in supporting the Nigerian government. MARKETS II was implemented during a period of increasing government recognition of the important role agriculture plays in Nigeria's economy. The recognition was spurred in part by the fall of the price of oil beginning in late 2008, which brought renewed attention to the agriculture sector's potential for diversifying and strengthening the Nigerian economy. MARKETS II worked with the government at all levels, particularly the Federal Ministry of Agriculture and Rural Development's staff and advisors, and the state-level Agriculture Development Programs (ADPs) and their EAs who provide day-to-day support to farmers based on MARKETS II's signature POP. This support has helped to strengthen the extension services' relationship with farmers in project-targeted states and will be central to the sustainability of the project's interventions.

Through these efforts, MARKETS II has made a significant direct and indirect impact on Nigeria's agriculture sector. After five years of implementation, working in seven value chains in 26 states, MARKETS II farmers have achieved more than \$762 million in incremental sales (or the value of sales over what would have been anticipated without MARKETS II's interventions). MARKETS II participants are reporting the following productivity increases in crops: 119 percent and 141 percent increases in wet-season and dry-season rice, respectively; 242 percent and 335 percent increases in wet-season and dry-season maize, respectively; a 66 percent increase in soybeans; 72 percent in sorghum; 159 percent in aquaculture; 63 percent in cocoa; and 104 percent in cassava.<sup>1</sup> USAID's investments in agriculture have leveraged \$27 million in private investment from off-taker processors and \$80.6 million in public investment.

In addition to its impact on direct beneficiaries, MARKETS II has achieved indirect impact by sharing its model and resources widely. Success is contagious in Nigeria, and entrepreneurs throughout the value chain know a good deal when they see it. Thanks to "copycatting," which MARKETS II promoted, farmers are training their neighbors, EAs are training their colleagues, other donor and government programs are replicating the MARKETS II training approach, and processors are replicating the project's facilitation model. Many agribusinesses are taking practical steps to secure small farmer success through sustainable linkages to national, regional, and global food supply chains while meeting consumer demands and international standards for environmental and social sustainability and traceability. This is not corporate social responsibility; it is business.

Through MARKETS II, USAID has demonstrated that partnerships between smallholder farmers and value-chain actors help to ensure food security, improve livelihoods, and reduce poverty, while producing food for local, national, regional, and international markets. The continued replication of this model by partners in the public and private sectors will ensure the creation of many more "MARKETS II millionaires" in the years to come.

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<sup>1</sup> Productivity data compares fiscal year 2017 results over baseline.



## Impact Beyond the Farmgate

**Through a demand-driven approach involving and strengthening the capacity of its partners and stakeholders at multiple levels, MARKETS II helped foster a sustainable, scalable market system that increases rural prosperity and food security in Nigeria. Key examples include:**

*The private sector now invests in processing capacity and continues to use MARKETS II's methods.* UMZA International Farms Ltd. is expanding due to its experience with MARKETS II and its recognition of the mutually beneficial relationships it can build with smallholder farmers. It constructed a separate warehouse for MARKETS II farmers' paddy, added a \$2.7 million milling line, and secured land for expansion with an out-growers scheme. With this expansion, UMZA is now employing 165 full-time staff, with another 1,200 part-time employees.

MARKETS II's processing partners — Labana Mills in Kebbi state, Popular Mills in Kano state, and Olam Nigeria in Nassarawa state — all are in the process of expanding their processing capacity. Labana has provided motorcycles to EAs to facilitate their outreach to farmers and, with MARKETS II's encouragement, continues to meet with lead farmers to facilitate successful implementation of its out-grower activities. Labana's general manager explained, "We are their permanent customers, they are our permanent out-growers." At MARKET II's closeout, Labana had a complete, integrated rice mill that processed and packaged 320 tons of rice per day, as well as multiple warehouses, a water treatment plant, a boiler, and a weigh bridge. The company also recorded 1,600 staff and 560 laborers. Olam Nigeria's out-grower scheme, which replicated aspects of the MARKETS projects' methodology, was recognized as a "catalytic innovation in African agriculture" by the Rockefeller Foundation, and it has continued to strongly support this approach.

Feed Tech also built a new warehouse and invested in new machinery to increase its maize production capacity from 30 tons per day to nearly 100 tons per day, and plans on hiring additional employees. Since working with MARKETS II, Hule and Son's soybean processing capacity has increased from 50 to 150 tons per day, its team has grown from 32 to 72 staff (45 full-time), and its network has expanded from 4,000 to 6,000 out-growers. Hule and Sons has expanded beyond Benue and supplies raw material to feed mills nationally. Hule plans to acquire equipment to refine soya oil and grind soy into livestock feed, and is meeting with investors thanks to its visibility from the MARKETS II partnership. Allied Atlantic Distilleries Ltd. in Ogun state is building a new cassava plant to increase its capacity for ethanol production from 9 million liters per year to 22.5 million liters per year. To support its expansion program, the company also plans to establish a 5,000-hectare farm in Oyo state, managed in collaboration with local farmers.

Nigerian Breweries went from purchasing 30,000 to 100,000 metric tons of sorghum per year due to its experience with the project. With the availability of high-quality sorghum in the local market, it now depends less on raw material imports, and is not disturbed by foreign exchange fluctuations.

MARKETS II-trained cocoa farmers who received international certification are consistent suppliers to MARKETS II large agro-trader exporter partners — such as Multi-Trex Integrated Foods Plc, Armajaro Nigeria Ltd, ECOM Trading, and Agro-Traders.

*Banks institutionalize MARKETS II curriculum and loan product designs.* Since working with MARKETS II, LAPO, DEC, and Fortis microfinance banks understand how to lend to different value chain actors and have incorporated elements of MARKETS II's NAEC curriculum into their training and service delivery programs for staff, clients, and potential clients. The three microfinance banks also designed agriculture-appropriate loan products with the project's support. DEC additionally has incorporated loan products for small-scale mechanization in its rural lending portfolio. LAPO has expanded its program, has an annual loan disbursement of 15 billion naira to small-scale rural businesses and farmers, and reports a loan recovery rate of 98 percent. Fortis has started its own lending program to farmers.

At the national level, the Central Bank of Nigeria and Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL) are using MARKETS II's rice POP as the core curriculum to continue the Anchor Borrowers' Program. In 2017, at NIRSAL's request, the project delivered a training-of-trainers program on the project's rice POP to the Kebbi Anchor Borrowers' Program, NIRSAL staff, and affiliated extension staff.

*Companies provide continued credit to farmers.* MARKETS II encouraged intra-value-chain input financing to producer groups and small businesses. Project partner Armajaro provided inputs to cocoa farmers, with farmers repaying via cocoa beans at harvest time. Syngenta extended credit to pesticide spraying service providers, and the West African Cotton Company gave seed and fertilizer to its rice seed growers in Kano, with farmers repaying with produce after harvest.

*Quality input distribution networks to farming communities develop and expand.* MARKETS II facilitated strong links between farmers and reputable input suppliers, resulting in farmers increasing demand and suppliers recognizing new market opportunities. Input suppliers have hired EAs and lead farmers to serve as their sales agents, establishing distribution networks in farming communities and providing an additional source of income for sales agents. In addition, MARKETS II networked farmers became seed producers for local seed companies. For example, MARKETS II worked with Strategic Seeds to supply them with seed producers, train their existing seed growers, and provide connections and visibility among major rice value chain stakeholders and clients. Strategic Seeds' managing director explained, "We buy agro-chemicals from Syngenta and trailer loads of fertilizer from Notore or Golden Fertilizer. These companies also train our farmers to use their products. This is possible because MARKETS II brought us together as partners. Helping emerging companies like ours to stand on their feet and to keep growing is one of the remarkable legacies of MARKETS II." With MARKETS II's support, Strategic Seeds has become one of the more reputable seed companies in the country.

*Farmers' associations are business models for others.* The West African Agricultural Productivity Project was impressed by MARKETS II tractor grantee Kiru Fadama's stellar performance, so they engaged them to produce 10 hectares of maize foundation seed. Tecni Seed and Da-Algreen Seed sent their out-growers to learn from Kiru, and another MARKETS II grantee in Kaduna, Anguwar Makama, visited to learn from them as well. Kiru's chairman says, "Farmers' groups in this locality are always visiting us to find out why we are doing so well, and we are glad to offer our advice. We are already well-established in sorghum, so we will expand into other crops. We want more small-scale farmers to know farming is a lucrative business. This project brought us this far, and we will ensure the impact will always be felt."

Neighboring farmers also noticed MARKETS II tractor grantee Anfani's fields and success. The cooperative's achievements, its expanding membership to farmers in nearby communities, and the credibility it gives farmers have increased its influence to improve non-members' practices.

## Section I

# The MARKETS II Approach

MARKETS II promoted the principle that agriculture, and not just farming, can be a profitable and sustainable business. It helped farmers produce what they could sell — profitably and for the long term — by ensuring that their products’ quality and seasonality met market demand, analyzing limiting factors and working to overcome them, and recognizing business opportunities in the market system. But the road from the field to the factory is long, and helping farmers make the journey from subsistence to agribusiness required a legion of motivated public and private sector actors working in a coordinated way. To ensure the sustainability of this approach, MARKETS II served as the supervisor, facilitator, and coordinator, while Nigerian value-chain actors implemented activities. These actors received technical agronomic and small-scale business training, organizational development capacity building and mentoring, and other support to help them recognize and tap into agriculture opportunities and improve the reach, quality, and profitability of their services.

The project’s approach began with the market — first, mapping the overall market demand and supply potential, and then identifying where it was possible to increase profitability and productivity. This included identifying potential buyers of Nigerian farmers’ products, often small to large agro-processors with unmet demand for raw materials, in the project’s targeted states and value chains. The project identified these processors through a value chain analysis and state-selection process — described in Section II — during the project’s first year. MARKETS II staff met with agro-processors to assess their needs and introduce the project’s approach for helping processors access higher-quality raw materials, according to the processors’ own parameters (for example, a high malt content for sorghum or a long grain suitable for milling for rice) and at the desired quantities. With the processors’ interests secured, MARKETS II turned next to state ADPs, which play a pivotal role in providing extension services to farmers, to introduce the activity, gain their buy-in, and identify local government areas (LGAs) where farmers were growing a given crop. Once the public and private sector agreed to participate in the activity, the project facilitated developing and signing implementation agreements (IAs) with the processor and the ADP.

Based on the IA, MARKETS II considered the number of farmers it needed to mobilize to contribute to meeting processors’ needs. For example, if a rice miller required 40,000 metric tons of rice, and 5 metric tons per hectare could be harvested through MARKETS II’s training and support, the farmers would need to plant 8,000 hectares. Because farmers have an average of 1 hectare of land, approximately 8,000 farmers needed to be mobilized to meet the processor’s demand. MARKETS II considered the following factors to determine the number of farmers to mobilize: overall project budget, project targets, processors’ needs, number of continuing or new MARKETS II farmers in an area, concentration of farmers within those areas, and the “copycat” potential for neighboring farming communities.

Through ADPs, the project determined which LGAs were already growing the commodities, how many farmers were growing the commodities, and whether EAs needed to be trained in MARKETS II's value chain commodities' production methods.

To strengthen ties to processors and reduce transportation and logistics issues posed by Nigeria's poor-quality road infrastructure, MARKETS II sought to mobilize farmers in areas that were accessible to processors. Additionally, MARKETS II required farmers to work in groups, contributing to transportation cost reduction through commodity aggregation.

To expand the number of farmers reached by the project and to promote sustainability, MARKETS II contracted local agriculture consulting firms as "service providers" through competitive processes for each state and each commodity every growing season. Working under the direct supervision of MARKETS II, each service provider mobilized thousands of farmers per season and oversaw training programs, provision of technical assistance, and collection of monitoring and evaluation data. Most importantly, these service providers worked hand-in-hand with state ADP EAs who provided training and day-to-day support throughout the growing seasons to the project's lead farmers and other farmers.

A key sustainability factor was actively involving state ADPs. The state ADPs and extension services were established under a World Bank program in the 1970s; however, when funding for this program ran out in the 1990s, the government of Nigeria's extension program all but collapsed. MARKETS II saw the ADPs' and EAs' potential because of their extensive local knowledge: they know local farmers and they know where each of the commodities is grown. Under MARKETS II, EAs received extensive training and capacity building on the project's POP for target crops and given a small transportation stipend to travel to rural areas and work with farmers. In addition, they were trained in leadership skills and group dynamics to build confidence. To improve the ADPs' internal supervision and communication,

### IA's WITH STAKEHOLDERS

The overall objective of the IA was to establish a collaborative understanding among the state ADP, the relevant processor/buyer, and MARKETS II.

#### **Role of Private Sector Processor/Buyer**

- Buy commodities produced by MARKETS II farmers
- Participate in all activities, including farmer training
- Assemble an out-grower and procurement coordinating team to make logistics arrangement for buying commodities
- Collaborate with MARKETS II and ADP to conduct the cost, yield, and income survey

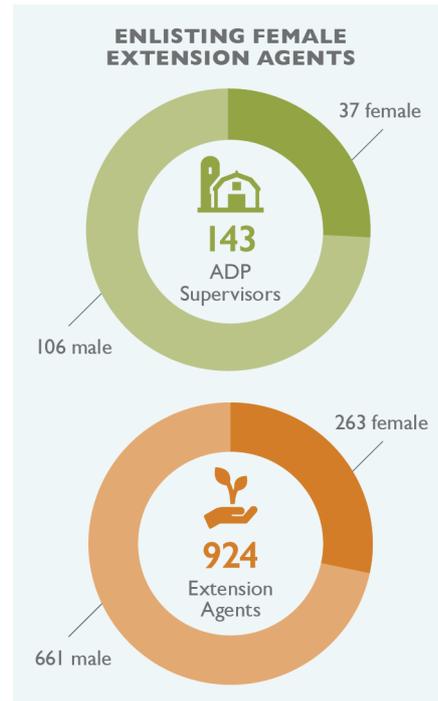
#### **Role of MARKETS II**

- Collaborate with ADP and processor/buyer to link farmers to quality and certified inputs (e.g., seed varieties, fertilizer, and pesticides)
- Provide POP manuals to farmers to improve best agronomic practices
- Train lead farmers and group leaders on group dynamics, leadership, and business planning using the Nigeria Agricultural Enterprise Curriculum
- Train farmers and EAs on nutrition integration into agricultural value chains

#### **Role of State ADP**

- Participate in training-of-trainers activities organized by MARKETS II
- Distribute approved manual and POP to farmers
- Assist out-growers in timely application of fertilizer and pesticides
- Get involved in buyback negotiations to ensure win-win between farmers and processors
- Provide extension services to MARKETS II-trained farmers, and by extension, other farmers producing soybean
- Monitor buy-back of commodity between processor/buyer and out-grower farmers

MARKETS II encouraged selection of ADP program managers, who then supervised and coordinated the EAs assigned to MARKETS II activities and provided project information and monitoring and evaluation data to ADP management. The project enlisted female EAs at each ADP to help ensure the participation and success of female farmers. To increase the numbers of trained female EAs – there were few female EAs within the ADPs and the ADPs were not hiring new EAs until the end of the project – the project provided basic training in crop extension to female staff at the ADP’s Women in Agriculture Units, which also supported MARKETS II’s nutrition and livelihood components. In total, MARKETS II worked with 924 EAs, of which 28 percent were female, across project states. In addition, 26 percent of ADP supervisors (were female who worked with the project. To compensate for the overall low number of female EAs in the ADP system, the project also promoted the use of female lead farmers.

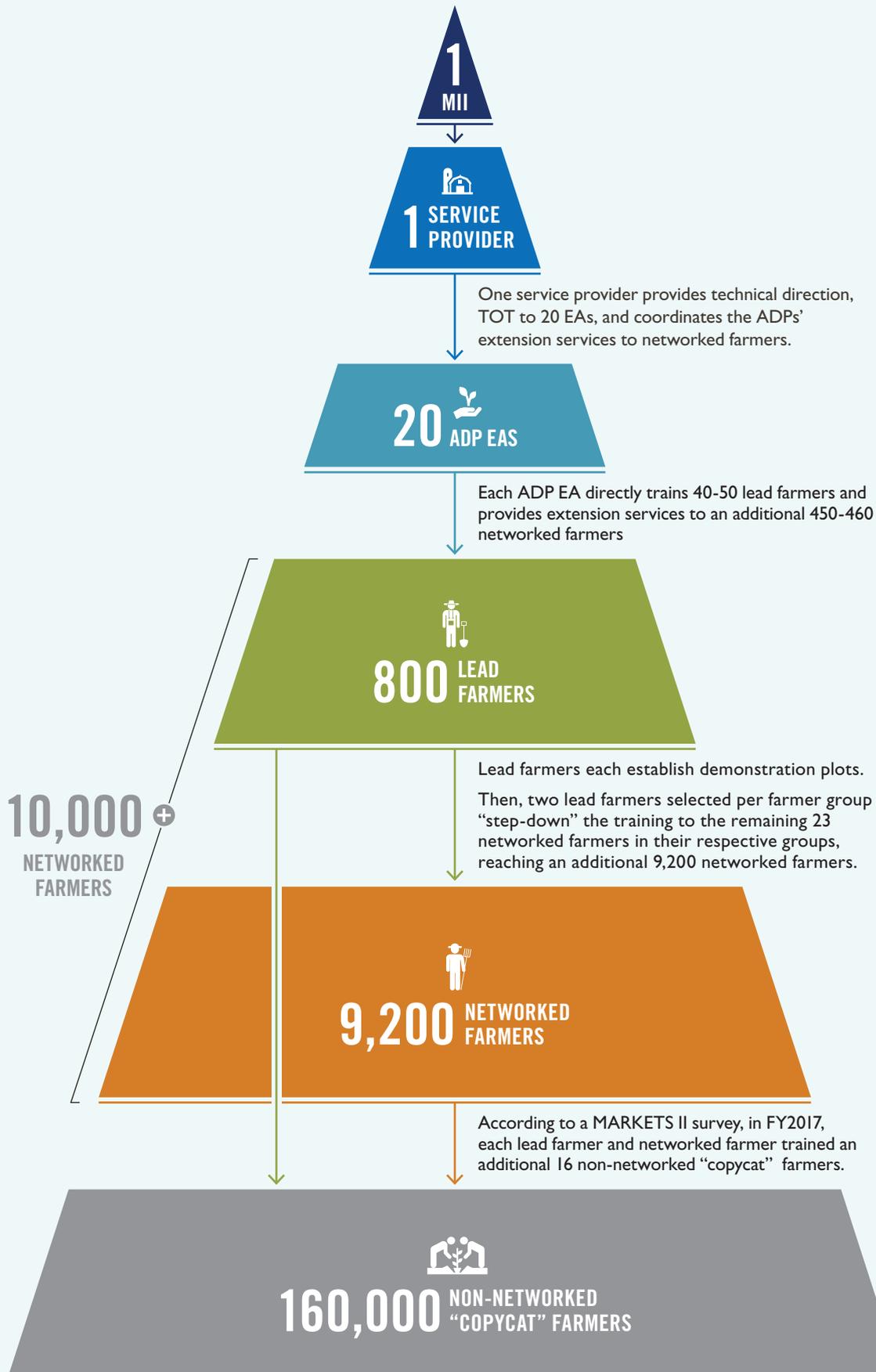


Together with EAs, service providers brought farming communities into the MARKETS II network, conducting outreach to inform them of the agro-processors’ out-grower schemes and potential opportunities. The project worked with established farmer groups; where they did not exist, service providers helped to establish them. MARKETS II strengthened selected farmer groups through group dynamics and leadership training. Farmer groups, which comprised about 25 farmers (a manageable number for organizational and training purposes), could be all-male, all-female, or mixed sex. Each farmer group selected lead farmers — chosen based on their experience with farming in the community, their willingness to train others, and their possession of some literacy skills. The lead farmers received in-depth training by EAs. Afterwards, they “stepped down” that training to other group members and established a demonstration plot in a high-trafficked area to show farmers firsthand how to apply the new practices. Lead farmers became “junior EAs,” recognized in their communities for their farming abilities, playing an important and ongoing role in teaching others. The graphics on the next two pages show MARKETS II’s step-down approach and intervention areas.

“Since **MARKETS II**, EAs are able to go to the field [there were no resources before to do this], gaining job satisfaction and recognition because they know what they are talking about. When you look at the skills of the EAs that worked with **MARKETS II** compared to their colleagues in the extension system, they are a special case. They are hot cakes now in other projects, being sought by other donor projects.”

— PROFESSOR SANI MAKI,  
SG2000-NIGERIA

## HOW DOES MARKETS II REACH 10,000 NETWORKED FARMERS AND 160,000 NON-NETWORKED FARMERS?



## AREAS OF INTERVENTION

### NORTHERN REGIONAL OFFICE

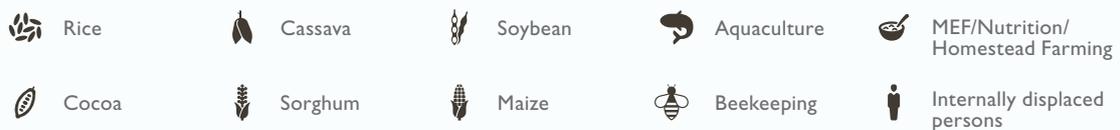
Rice  
Sorghum  
Soybeans  
Maize  
Aquaculture  
MEF/Nutrition/  
Homestead Farming  
Beekeeping

### MIDDLE BELT REGIONAL OFFICE

Rice  
Soybeans  
Cassava  
Aquaculture  
MEF/Nutrition/  
Homestead Farming  
Beekeeping

### SOUTHERN REGIONAL OFFICE

Cocoa  
Cassava  
Aquaculture  
MEF/Nutrition/  
Homestead Farming  
Beekeeping



MARKETS II provided ad hoc assistance to Bridge to MARKETS 2 aquaculture farmers in Lagos, Osun, and Ogun in the initial years as they still required support. The project did not continue in these states because they were not MARKETS II selected states.

Each demonstration plot displayed a USAID-branded signpost with the farmer’s name, the variety grown, and relevant information to inform surrounding farmers (not only MARKETS II farmers). In 2016, the project added logbooks to better track the application of technologies on the plots. Demonstration plots planted one half using traditional farming practices, and the other half using MARKETS II’s POP and recommended technologies designed to increase yield and crop quality. The visible results, tangible yields, improved quality, and increased income helped convince farmers to adopt the new crop management methods. Neighboring farmers not trained in the MARKETS II approach witnessed the demonstration plots and their peers making home improvements, increasing assets, and sending children to school, spurring a “copycat” effect in which these farmers began to adopt the practices.

**BUILDING TRUST KEY TO SUCCESS**

Written contracts are not enforceable in most of Nigeria, so relationships between buyers and sellers are built on trust and past experience. To help build mutually beneficial business relationships, MARKETS II convened stakeholder meetings at the start and end of each growing season to bring together farmers, processors, EAs, and others to build trust up and down the value chain. In addition, the project invited stakeholders to field days and training programs to provide more opportunities for value chain actors to get to know one another.

MARKETS II staff, service providers, farmers, EAs, and processors/off-takers performed market surveys in the project’s value chains to inform the negotiation process, facilitated by MARKETS II, to determine a fair price, delivery process, and payment terms for buy-back of the farmers’ crops. Farmers could sell their crops on the open market or accept the buyback price; in either case, they usually received a quality premium (higher price) per unit sold due to the quality of their harvest. In addition, networked farmers achieved double or triple the yields they had attained prior to MARKETS II’s interventions, and their incomes increased commensurately. This resulted in greater food security for farmers and their families and allowed them to make additional investments in their families’ well-being (such as improving their housing or sending their children to better schools). Thanks to these efforts, over the life of the project, farmers earned \$1,767,070,727 in sales. MARKETS II-supported farmers are reporting a 119 percent and 141 percent increase in productivity in wet-season and dry-season rice, 242 percent and 335 percent increase in wet-season and dry-season maize, 66 percent increase in soybean, 72 percent increase in sorghum, 159 percent increase in aquaculture, 63 percent increase in cocoa, and 104 percent increase in cassava.<sup>2</sup>



Farmers achieved these gains through MARKETS II’s total value chain approach: bringing all stakeholders together to work toward common goals, identifying and taking advantage of new opportunities to create value, and promoting a change in mindset from subsistence farming as a way of life to agriculture as a business. The

<sup>2</sup> Productivity data compares fiscal year 2017 results over baseline.

following sections provide an overview of how MARKETS II brought its resources to smallholder farmers throughout Nigeria.

### **PRODUCERS' CAPACITY DEVELOPMENT AND ORGANIZATIONS STRENGTHENED<sup>3</sup>**

Commercial agriculture for Nigerian smallholder farmers requires strong, effective producer organizations. For example, effective producer organizations enable members to achieve economies of scale through bulk purchases of inputs and crop marketing activities, access and provide credit, afford technologies to mechanize farm activities and improve post-harvest handling, advocate for their members to local governments and in negotiations with buyers, and develop into small-scale rural agribusinesses — in short, to provide genuine economic benefits and services to their members and communities. Producer associations have a range of capacity in Nigeria — some have bank accounts and function as small agribusinesses, while others are a loose association of farmers. MARKETS II worked with producer organizations and value chain actors<sup>4</sup> who positively affect producers to help them develop into sustainable enterprises and serve as business models for others.

Effective producer organizations provide real advantages to members and offer a platform for the project to reach more farmers. Therefore, MARKETS II made participating in a farmer group a criterion for being networked into the project. Where farmer groups did not exist, MARKETS II, through service providers and EAs, helped to establish them and supported them to transition to farming as a business via crop management training (described below), as well as soft skills and business development training to help groups function more effectively and profitably. Using a participatory approach, these soft skills training activities, such as group dynamics and leadership, helped farmer groups define their vision for what they could achieve as a team, mitigate conflicts and mobilize resources for common benefits, and help leaders work effectively with group members. In addition, the soft skills training helped to build EAs' and lead farmers' confidence to conduct step-down training.

In addition to soft skills, MARKETS II helped farmer groups develop their business skills through the project's Nigerian Agriculture Enterprise Curriculum (NAEC) and Microenterprise Fundamentals (MEF) training programs. Originally developed under the first MARKETS project, NAEC helped farmers understand key concepts to successfully operate agricultural enterprises, which were often neglected by farmers and EAs due to a subsistence approach to agriculture. NAEC included farm business cycles, recordkeeping, simple financial management, business planning, purchasing decisions, group membership, basic cash flow, assessing costs and benefits, and savings and credit. A highly adaptable curriculum, NAEC was modified under

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<sup>3</sup> Although the project contract's main focus for developing producers' capacity and strengthening organizations was smallholder farmer organizations, it expanded its capacity-building support to improve organizations' and individuals' services as a way to increase smallholder farmers' productivity, income, and food security. Actors included farm service providers, EAs, capacity-building consultants, cooperatives officers, agro-input dealers, financial institutions, aggregators, millers, and off-takers. These actors are presented in various sections throughout the report.

<sup>4</sup> Farm service providers, EAs, capacity-building consultants, cooperatives officers, agro-input dealers, financial institutions, aggregators, millers, and off-takers. These actors are presented in various sections throughout the report.

MARKETS II for agro-dealers, small millers, and internally displaced persons (IDPs), and customized to the project's value chains.

Realizing the need for improved nutrition and hygiene at the farm household level, MARKETS II saw an opportunity to develop healthy farmers while also increasing their income. The MEF curriculum taught farm households simple financial management and resource planning to achieve their personal and business goals and identify key steps to improve household nutrition, hygiene, and homestead income-generating opportunities, such as homestead gardening. Farm households then used part of what they were producing in the field and in their home gardens to prepare nutritious meals for the household. The MEF training program was highly adaptable to diverse audiences; although used for all of MARKETS II's program areas, it was particularly targeted to women, youth, and IDPs, with the goal of promoting small-scale business development.



Female farmers inspect freshly threshed rice grains during a MARKETS II mechanized threshing demonstration in Jigawa state. Mechanized threshing reduces time, effort, and breakage compared to manual threshing; improves paddy quality; and eliminates debris, which is preferred by rice processors and other buyers.

## TECHNOLOGY GENERATION AND DEPLOYMENT EXPANDED

For every crop, there are many potential technologies that can be applied, but often these technologies are too complicated, costly, or inappropriate for smallholder producers. MARKETS II took a simplified approach, promoting key practices based on the following criteria:

- Affordability to farmers
- Accessibility to farmers
- Ease of deployment
- Ease of management by farmers
- Measurable improvement over the current state of practice
- Superiority to other existing options

Based on the above, MARKETS II introduced technologies to farmers via the POP, which was developed and field-tested under MARKETS and Bridge 2 MARKETS 2 in coordination with project service providers and EAs. Together, MARKETS II staff, service providers, and experienced EAs delivered the POP via a training-of-trainers program to other EAs. Using the POP, each EA provided the training-of-trainers program to 40 to 50 lead farmers per training phase, who then stepped down the training to other

members in their farmer groups. EAs also helped establish lead farmer-managed demonstration plots. Each lead farmer used a project-developed take-home guide to conduct step-down training in their farmer group and communities.

The POP training materials were picture-based to ensure that farmers with all levels of education could easily understand them. Each practice was introduced to farmers via interactive training using an applied-learning methodology to help participants connect with the materials and apply the new content in their everyday lives. Using demonstration plots, EAs and lead farmers presented new techniques and gave farmers an opportunity to put their training into immediate practice. The project delivered three phases of training each year: pre-season (planning, knowing your land, seed selection, and plowing); in-season (use of agrochemicals, weed removal, and crop management); and harvest/post-harvest (reaping and post-harvest handling). The project's trainers encouraged farmers to share what they learned with non-networked neighboring farmers.

### LEVERAGING MARKETS II'S TRAINING PLATFORM

MARKETS II took advantage of the project's training platform to achieve multiple goals in addition to improving farmer knowledge. For example, the project invited input suppliers to the training so that farmers would have easy access to improved seeds and fertilizer. The proper equipment and protection for pesticide application was demonstrated, as were methods of applying fertilizer. Finally, the project used this training platform to raise awareness of important health-related issues, such as nutrition and prevention of avian influenza, Lassa fever, and Ebola.

## OVERVIEW OF NEW TECHNOLOGIES APPLIED TO EACH VALUE CHAIN

*Rice.* Improved seeds (FARO 44 or FARO 61) based on millers' requirements, spacing, line planting, urea super granules (USG) and urea deep placement (UDP), nurseries, transplanting, dry-season production, water management, and panicle harvesting.

*Maize.* One seed per hole, spacing, plant fertilizer, cover fertilizer application, dry-season irrigated maize, two-cycle dry-season maize production using short-term varieties, and USG/UDP.

*Soy.* Improved seeds (non-shattering higher-yield varieties), fertilizer application, inoculation of seeds before planting, spacing, harvest techniques to improve soil, and bee pollination service pilots.

*Sorghum.* Improved seeds based on off-taker requirements, six-to-eight seeds per hole, two stands per hill, fertilizer application, and improved harvesting techniques.

*Aquaculture.* Selection of fingerlings, feeding, water quality management, and processing to increase shelf life using improved smoking kilns.

*Cocoa.* Nurseries; using a club (rather than a machete) to break open pods; pod fermentation trays; raised platforms for drying; and meeting certification requirements, including proper pesticide use, waste management, fair labor practices, and no child labor.

*Cassava.* Improved land preparation, nurseries, fertilizer application, higher-yielding variety stems (TME 419, TMS 98/0505, TMS 98/0581, TTMS M98/0068, and TMS 30572), and harvesting techniques.

For all value chains, MARKETS II considers activities like recordkeeping, business planning, and production as management technologies critical to the success of the above activities. Please see the Producers' Capacity Development and Organizations Strengthened section (page 10) for more details.

In addition to simple technologies adoptable by any farmer, MARKETS II promoted appropriate agricultural mechanization. Most smallholder farming tasks in Nigeria are still conducted through time-consuming manual labor; mechanization can decrease production costs and time by reducing the need for manual labor for land clearing, harrowing, harvesting, threshing, and other tasks. Mechanization also plays a vital role in decreasing post-harvest loss and allows farmers to deliver a cleaner product to processors by removing sand and stones, thereby increasing quality premiums. For these reasons, the project invited equipment distributors to demonstrate appropriate-scale mechanization technologies — such as low-cost paddy seeders, single- and multi-crop threshers, portable maize shellers, power tillers, handheld reapers, and motorcycle-powered water pumps — at MARKETS II-sponsored training programs. Through its grants

#### **GPS: SIMPLE, ACCESSIBLE, PROFITABLE**

Farm size dictates the amount of seed to be planted, the volume of fertilizer and pesticides needed, and the amount of labor it will take to harvest the field. But many Nigerian farmers incorrectly estimate the size of their farms, and use too many or too few inputs for their fields.

Given the importance of knowing farm sizes, MARKETS II trained EAs on the use of global position system (GPS) devices, which they use to measure the acreage of farmers' land. Armed with accurate data, farmers are buying only the necessary amount of inputs and saving money in return. Farmers are more likely to secure bank loans because banks are confident in their accurate calculation of costs and yield. Trained EAs are also creating their own offshoot GPS businesses and providing these services to non-networked farmers.

program, MARKETS II also supplied these types of equipment to some of its more advanced farmer groups. Through these grants, MARKETS II increased on-farm mechanization by developing model associations and model agribusinesses, which then provided mechanized services to members and neighboring farmers for a fee.

To increase uptake of these technologies, the project demonstrated and promoted the business opportunities of using appropriate, cost-efficient agricultural production and post-harvest equipment by farmer associations and farming service providers.

## ACCESS TO AGRICULTURAL INPUTS INCREASED

To grow quality, high-yielding crops, farmers need to invest in appropriate and efficient use of high-quality seeds, fertilizers, and pesticides. Unfortunately, for many years, farmers have been at risk of purchasing adulterated, poor-quality, or counterfeit products. This made farmers skeptical of purchasing any agricultural inputs, resulting in low productivity and a semi-subsistence farming system.

The importance of correctly using certified seeds, appropriate fertilizers, and proper pesticides was central to the POP that MARKETS II used in its farming training programs and demonstration plots. Appropriately using these inputs results in improved production and decreased production costs because fields require fewer inputs. For example, farmers' correct application of fertilizer and plant spacing also decreased their need for weeding, further reducing their labor costs. Through the NAEC training, MARKETS II encouraged farmers to buy inputs in bulk during the off-season when supplies were high and costs were lower. As a result, smallholders increased demand for these products. In parallel, MARKETS II sought to increase the supply of quality inputs reaching farmers by facilitating private sector input distribution and creating stronger linkages between farmers and suppliers. MARKETS II invited reputable vendors of seed, fertilizer, other agro-chemicals, and mechanical implements to its training programs. This facilitated farmers' access to genuine inputs, enabled farmer groups to make bulk purchases, and strengthened relationships between farmers and suppliers. Based on this experience — and recognizing a new market in smallholder farmers — input suppliers hired EAs and lead farmers to serve as their sales agents. This helped to establish distribution networks and provided an additional source of income.

To support introducing farmers to improved quality inputs, the project provided additional financing to the government of Nigeria's Growth Enhancement Scheme (GES). GES provided small quantities of subsidized fertilizer and seeds to allow farmers to test the efficacy of using these inputs on their farms.

*Improved seeds.* To increase the supply of certified seed for farmers, MARKETS II trained selected lead farmers and their farmer associations on best seed production practices to become seed out-growers for local seed companies in the rice, maize, soybean, and sorghum value chains. In addition, the project trained seed companies' own out-growers. Partner seed companies — including Mamora, Tecni, Strategic Seeds, Greenspore, Premier Seed, West African Cotton Company, and Seed Companies Ltd. — provided agricultural inputs to out-growers, and MARKETS II trained them on its POP and NAEC. MARKETS II also trained cocoa and cassava farmers in producing higher-quality planting material (e.g., cocoa nurseries and

cassava higher-yielding stems). Similar to other value chains, limiting factors in the aquaculture value chain included the amount and quality of starter material. In response, the project selected hatcheries to receive equipment grants and training to improve the quality and quantity of their fingerling production (“seeds”). This activity increased the supply of seeds, planting material, and starter material, while providing a lucrative business relationship for out-grower farmers, nurseries, and hatcheries.

In addition to strengthening the supply of certified seeds for farmers, MARKETS II also supported the introduction of new varieties. For example, the project worked with the Cocoa Research Institute of Nigeria and selected cocoa farmers to develop small-scale commercial nurseries growing improved hybrid varieties. For sorghum, the project supported networked farmer groups to test new, potentially higher-yielding varieties of sorghum for Nigerian Breweries Plc.

*Fertilizer and other agro-chemicals.* Nigerian farmers need to increase fertilizer use and improve its efficiency to increase productivity. Through the POP, MARKETS II demonstrated appropriate fertilizer use, such as planting fertilizer rather than broadcasting, which often resulted in fertilizer being blown away or washed away by rain. The project promoted the use of USG, which were introduced to the Nigerian market in 2010. USG are controlled-release technology and eliminate the need for repeated applications of urea. The proper placement of USG, through UDP, meant farmers applied less urea with improved yields. At the project’s outset, USG was applied only for rice. However, given its efficacy and cost-saving potential, MARKETS II tested USG use for maize and sorghum; when it proved to be effective, MARKETS II integrated USG into its POP programs.

MARKETS II also promoted the use of USG through the government of Nigeria’s GES program. Recognizing the opportunity to scale up USG use among non-networked farmers and capitalize on a market opportunity for its private sector partners, MARKETS II secured the government’s approval to include USG in the GES program and worked with local fertilizer suppliers to ensure USG availability at GES redemption centers. MARKETS II then trained EAs to provide in-situ orientation training sessions on how to use the inputs to farmers waiting at redemption centers.

Unfortunately, the GES program collapsed after the government changed hands in 2015. MARKETS II’s private sector partners had increased USG production to meet GES-driven demand, but were left with a two-year supply, creating capital and warehousing costs. In response, MARKETS II invited them to farmer training activities where they could sell their USG stocks.

MARKETS II also promoted crop-protection products — pesticides and herbicides that, when used properly, would reduce labor costs for weeding and protect crops from the spread of plant and pest diseases. The project team recognized the business opportunities in supplying spraying services and trained farmers on which pesticides to use (and when), per the project’s Pesticide Evaluation Report and Safer Use Action Plan; pesticide handling; and protective measures to ensure their own health and safety when using crop-protection products. In addition, the project provided NAEC training to bolster the business side of farmers’ spraying services.

## WATER AND SOIL MANAGEMENT STRENGTHENED

Poor water and soil management practices leave Nigeria susceptible to soil degradation, water wastage, and the effects of drought and flooding. MARKETS II promoted context-appropriate soil and water management best practices and encouraged farmers to adopt stress-tolerant varieties to reduce vulnerability to changing weather patterns.

Through the POP, MARKETS II trained farmers to “know their soil” and then use the best technologies for sandy, loamy, or clay soils. The POP provided information on land preparation and erosion-fighting measures, such as minimum tillage, improved fallowing, and contour planting for farms on hillsides. To support sustainable nutrient-rich soil, MARKETS II promoted a mixture of organic and inorganic fertilizer, crop rotation, and identification and rectification of salt build-up from irrigation. Finally, the project encouraged composting as a means to enrich soil by increasing the nutrient content to enhance soil moisture and nutrient retention, particularly for homestead gardens. MARKETS II encouraged women’s groups to sell compost from scrap material that would have been thrown away.

### SYSTEM SYMBIOSIS

Maize harvesting leaves behind stalks that can be used as fodder for cattle, which is especially important during the dry season when there is not much pasture or cattle feed. The cattle then produce nutrient-rich manure that can be used to fertilize maize fields. In Kaduna, MARKETS II has encouraged dry-season maize farmers to adopt mutually beneficial relationships with neighboring cattle farmers. Following the harvesting of the maize cobs, cattle farmers pay maize farmers to allow their cattle to graze in their fields. In addition to receiving additional income, the maize farmers’ fields are cleared in an environmentally friendly manner, and the cattle produce organic fertilizer to nurture the next cycle of maize. It is a simple, effective, and profitable solution to promote good soil management.

The POP also included water-management techniques, including irrigation scheduling for dry-season cultivation to reduce water usage. MARKETS II promoted two low-cost irrigation practices: drip irrigation and motorcycle-powered water pumps. The project piloted a drip irrigation system in the 2013-14 dry season for homestead farming for five vulnerable women’s groups with an average plot size of 400 square meters. The objective was to show that using small plots and less water can produce reasonable quantities of food and enhance resilience. Drip irrigation expanded to 25 groups in Jigawa, Kebbi, Kano, Sokoto, and Kaduna states by project end. In addition to training in irrigation and homestead vegetable production, MARKETS II provided MEF training to the groups. It also provided training on drip-irrigation technology to USAID’s SHARE project and Action Against Hunger.

Traditional water pumps require large amounts of fuel to operate. Because many farmers have access to small motorcycles, MARKETS II tested the use of a Chinese-made, camshaft-mounted water pump. These motorcycle pumps ended up using less fuel, were more light-weight, and were easier to run and maintain than traditional pumps. The pumps also created a business development opportunity for small irrigation businesses, particularly for youth. Although the pumps originally were intended to use for dry-season cultivation, due to erratic rainfall, MARKETS II also began to promote them during the wet season. Pump sales showed mixed results because irrigation is usually carried out at night and motorcycles are targets for theft, making some dry-season farmers reluctant to buy the pumps.

The project also found that the motorcycle-powered water pumps could be used to fill and drain fish ponds. Aquaculture is, by definition, a water-intensive process. To reduce the drain on local water resources and minimize potentially negative environmental impact, MARKETS II trained fish farmers on how to reduce water consumption and repurpose wastewater. For example, the project promoted biological water-treatment methods to decrease the frequency with which farmers changed the water in their fish ponds. In addition, the project trained fish farmers on proper disposal and use of pond wastewater, such as using it for vegetable gardens.

## ACCESS TO FINANCE INCREASED

Access to finance is a critical challenge to small-scale farmers and other players along the value chain. Due to limited experience, risk aversion, administrative and opportunity costs, and limited bank branch offices, many commercial banks are hesitant to loan to the agricultural sector — in particular, to smallholder farmers or farmer groups. Many smallholders do not know how to access available credit from banks or other sources (e.g., producer organizations, input suppliers, or buyers), how to qualify for credit, how to use credit effectively to further commercial activities, or how to properly manage repayment obligations.



To help bridge the gap between smallholders and creditors, MARKETS II took a multi-level approach. First, at the farm level, the project worked to improve the financial management of selected smallholder farmer organizations using capacity-building training tools, such as the NAEC and MEF. Training topics included alternate sources of credit, timely and bulk purchases of inputs, and timely and bulk sales of commodities. The project also encouraged farmer groups to organize their own internal savings and credit programs. Second, within each of the seven target value chains, the project identified opportunities to link borrowers with lenders, and to build the capacity of lenders for improved service delivery to borrowers.

In Year I, the project conducted a bank diagnostic study to assess commercial banks' challenges and practices in lending to the agriculture sector. The assessment found that despite a government directive that banks must provide a certain percentage of their loan portfolio to the agricultural sector, most banks did not have a dedicated agriculture lending program. In addition, most banks offered terms to borrowers in the agriculture sector in a similar manner as they did for other sectors, usually with 30- to 60-day repayment terms. This was impractical for agricultural sector borrowers who needed to harvest and sell their crops before repayment could begin. To address this challenge, MARKETS II engaged eight interested banks and provided a five-day training program to help banks develop agriculture sector-friendly loan products. The training included a field day for bank staff to visit farmers, input dealers, processors, and other service providers to gain firsthand knowledge of how value chains work. As a result of MARKETS II's work with commercial banks, Sterling Bank, Diamond Bank, First City Monument Bank, and Access Bank all developed lending products for the agriculture sector and smallholders.

Despite MARKETS II's support to commercial banks and the new loan products, banks still hesitated to disburse loans to smallholder farmers, largely because they believed that the risk and the opportunity and administrative costs for lending to smallholders was too great and that farmers could not meet the collateral requirements. In addition, many banks did not have a presence in rural areas where farmers were located. Commercial banks' hesitancy motivated MARKETS II to expand its work with its long-term partner microfinance banks (MFBs) engaged in rural lending (but not farm lending). With the Lift Above Poverty Organization (LAPO), MARKETS II piloted a program to bring specific lending institutions and farmers/processors together to understand each other's businesses, identify mutually beneficial working relationships, and allow MFBs to determine where to offer credit. MARKETS II vetted farmer groups, helped them establish bank accounts, and analyzed their loan requirements. Based on this pilot, an initial set of five associations selected by LAPO signed memoranda of understanding. Once farmer groups received their loans, MARKETS II guided them on how to comply with loan terms and monitored their repayment. To build LAPO's rural capacity, MARKETS II provided a training-of-trainers program to its staff on the NAEC. LAPO then incorporated elements of the NAEC into its training and service delivery programs for its staff, clients, and potential clients to complement its loan program. LAPO has expanded its program, and has an annual loan disbursement of 15 billion naira to small-scale rural businesses and farmers, with a loan recovery rate of 98 percent.

After joint field trips with MFB staff, MARKETS II developed an agriculture value chain lending curriculum specifically for MFBs. MARKETS II then provided training in NAEC and value chain lending to the Development Exchange Center in northern Nigeria, the Abuja-based Fortis Microfinance Bank, and Eagle Flight MFB in the Niger Delta. The Development Exchange Center and Fortis Microfinance Bank also incorporated elements of the NAEC into their internal training and service delivery programs. Additionally, MARKETS II worked with individual partner MFBs to design loan products for farmers aligned with the agricultural cycle.

At the national level, MARKETS II participated on the Central Bank of Nigeria's Microfinance Advisory Board and Banker's Subcommittee on Economic Development and Agriculture, where it contributed ideas for policy decisions that would not adversely affect smallholder farmers; farmer groups; or agricultural sector micro, small, and medium enterprises. The project held initial discussions with the Central Bank of Nigeria and Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL) in 2016 on how the Anchor Borrowers' Program should be implemented. However, the project's suggestions to provide POP training in Kebbi as a pilot for the dry season, and to apply lessons from the Kebbi experience to pilot ABP in Benue for the wet season, were not accepted. In 2017, at the request of NIRSAL, the project provided a list of MARKETS II farmers in Kebbi state and delivered a training-of-trainers program on the project's rice POP to the Kebbi Anchor Borrowers' Program extension staff and NIRSAL staff.

Finally, MARKETS II encouraged the development of non-bank credit programs, including intra-value-chain financing of inputs to producer groups or small businesses. For cocoa, project partner Armajaro subsidized inputs to cocoa farmers, with farmers repaying via cocoa beans at harvest time. Syngenta also extended credit to pesticide spraying service providers, and the West African Cotton Company gave

seed and fertilizer to its rice seed growers in Kano, with farmers repaying with produce after harvest. In total, 822,763 micro, small, and medium enterprises, including processors, traders, and farmers, have received agriculture-related credit via MARKETS II assistance, with a total value of \$269,178,337.

## GRANTS AND SUBCONTRACTS FUND

To promote sustainability, reach more farmers, and support innovation, MARKETS II set aside \$10 million of its budget for a Grants and Subcontract Fund. This fund was designed to support MARKETS II in achieving change in target areas, build the institutional capacity of local subcontractors and grantees to carry on work after the project closes, and establish models for replication. As described above, local agriculture consulting firms (“service providers”) were one of the crucial elements of MARKETS II’s activities in promoting improved practices, identifying and organizing farmers, and training leaders and extension staff for high impact and maximum reach.

MARKETS II’s grants funds provided agricultural mechanization equipment and capacity building to farmer associations — supporting the development of agribusinesses by mitigating the challenges of manual farming and developing business models for other farmer groups to replicate. Training covered equipment use and maintenance and small agribusiness development tips, such as using the equipment to provide land-preparation services to neighboring farmers for a fee. Grant equipment included tractors, tillers, water pumps, fish hatchery and processing equipment, and motorized spray pumps.

MARKETS II issued four annual program statements in its initial years, resulting in hundreds of grant applications, but only six grants were awarded in 2014. Considering the quality of the concept papers received, MARKETS II changed its approach and criteria: It leveraged existing service providers to support grantee applicants to develop high-quality concept papers. Additionally, rather than having an open solicitation, the new criteria required applicants to be longer-term project farmers with technical support and experience working in MARKETS II’s value chains. This ensured that, at a minimum, the farmer groups had adopted the POP and had a basis transitioning from semi-subsistence farming to agriculture as a business. Farmer groups had to describe how they would successfully operate a business using the granted equipment and capacity-building skills to provide services to their members and the wider community.

The project determined that providing subcontracts to service providers was more effective than grants in reaching more farmers. Also, farmer groups could not absorb larger grants due to lack of experience with granted equipment and business management. Although USAID had requested that the project provide smaller grants, the administrative and human resources required to administer and manage them outweighed their impact compared to subcontracts. In coordination with



USAID, the grants portion of the Grants and Subcontract Fund was reduced to \$700,000 and the subcontracts portion increased by \$2.3 million.

MARKETS II grants have had a transformative effect on their recipients. Two tractor recipients — Danlawal and Kiru farmer groups — have increased their holdings from a few hectares to more than 50. Grantee Abanyom Farmers Multipurpose Cooperative Union in Cross River State received 20 motorized mist blowers to apply pesticides, herbicides, and other agro-chemicals to cocoa trees, earning 180,000 naira in its first season. Twenty young members of this cooperative learned how to operate the machinery and use personal protective equipment. In addition, the union’s proper spraying helped to increase yields, eliminate diseases, and reduce the amount of agro-chemicals applied (and the time needed to apply them). With the funds generated from this spraying business, Abanyom is now providing credit to its members. In the aquaculture value chain, upgrading eight hatcheries in the Niger Delta increased the availability of quality fingerlings for fish farmers in the region.



Jigawa extension agent, Abdullah Ahmas, trains lead farmers on improved harvest and post-harvest techniques, which can significantly reduce crop loss and increase income.

# Empowering EAs and Extension Services



PHOTO: MARKETS II

**Mukhtar Ibrahim, desk officer for the Kano ADP, assists farmers on various issues ranging from measuring their farms using GPS to helping with documentation for bank loans. Through MARKETS II, Mukhtar has significantly diversified his capacity and increased his responsibility with the Kano ADP.**

*“MARKETS II and the ADP had the same goal and objectives, which is to improve the living standard of our farmers. So, together we are going hand-in-hand, happily because we have the same goal to achieve. We're looking at the same direction, both with our government and the MARKETS II intervention.”*

— Mukhtar Ibrahim,  
EA coordinator for Kaduna State

State ADPs and their EAs are a critical element of the agricultural value chain, and MARKETS II worked with them to develop their capacity and provide practical tools and training. As a result, EAs have built strong relationships with the farmers they serve, improved their own agri-business skills, and expanded their training to non-MARKETS II areas and states throughout Nigeria.

Mukhtar Ibrahim joined the Kaduna Agricultural Development Program in 2001, but it was not until he started working with the original MARKETS project in 2009 that his professional transformation really took off. He was promoted to EA coordinator, and now leads 120 EAs across three value chains to support more than 40,000 farmers in Kaduna state. Mr. Ibrahim has become a role model for ADPs in Kaduna and in other states on farming best practices, building EAs' skills in improved technology and best agronomic practices using the project's POP. His capacity-building services and close mentorship has won him the confidence of his colleagues.

Through the “agriculture is a business” lens instilled in him through MARKETS II, Mukhtar also became an entrepreneur in 2013. He saw a gap between when farmers needed cash and the purchasing cycle of “off-takers.” He began buying directly from farmers when they needed to sell, and then sold to “off-takers” when they were ready to buy. He averages 120,000 naira per month since 2013 and was able to finish building his house in 2014 with his additional income.

Mukhtar's support for farmers has led to the doubling of their yields in sorghum, maize, and soybean, endearing him to many. He said, “I now know more farmers in the state through MARKETS II's support. Their lives and that of their families have improved because of the work we do. Our relationships have also improved significantly. I have participated in other projects, but I have benefited the most from MARKETS II.”

## Sowing Seeds, Yielding Better Lives



PHOTO: MARKETS II

Happiness Oselebe, a professor of plant breeding and genetics at Ebonyi State University, is a determined woman with a vision. In 2010, she founded a certified rice seed production company, Strategic Seeds Nig. Ltd, in Abakaliki, Ebonyi.

*“Improving the livelihoods of smallholder farmers, especially women, has always been my passion. They are now achieving what they could not over the years. Helping emerging companies like ours to stand on their feet and to keep growing is one of the remarkable legacies of MARKETS II.”*

— Happiness Ogba Oselebe,  
founder and managing director  
of Strategic Seeds

Between 2012 and 2014, Happiness registered the company; signed a contract with the Nigerian government to supply rice seeds for the GES; and received a license to operate as a seed company, producer, and agricultural input supplier for GES. As the company’s managing director, she led her staff to continue producing high-quality certified rice seeds.

However, she noticed that farmers were not easily convinced about adopting best practices for rice seed production. When she heard of MARKETS II’s recommended seed production best practices in 2014, she immediately signed an IA with the project and registered Strategic Seeds’ farmers as MARKETS II farmers. In 2015, MARKETS II’s West Africa Rice Development Association-trained rice seed expert led Strategic Seeds’ 65 farmers through line spacing, transplanting, proper application of chemicals and fertilizer, removal of “off-types,” and other best agronomic practices. Happiness declares that “MARKETS II’s intervention came to the rescue.”

Farmers who adopted MARKETS II’s practices increased their individual yields from 1.3 metric tons per hectare to 3 metric tons per hectare. In addition, the company increased its overall seed production from 237 metric tons in 2014 to 450 metric tons in 2016 and 465 metric tons in 2017. Strategic Seeds has also grown from five staff in 2012 to 25 staff since 2016.

In addition to improving farmers’ capacity, MARKETS II worked with Happiness to provide connections and visibility among Strategic Seeds, major rice value chain stakeholders, and clients. Recently, MARKETS II connected Strategic Seeds to Molon Agro, an input distribution company. Happiness explained, “We buy agro-chemicals from Syngenta and trailer loads of fertilizer from Notore or Golden Fertilizer, depending on availability. These companies also train our farmers to use their products. This is possible because MARKETS II brought us together as partners.”

With MARKETS II’s support, Strategic Seeds has become one of the more reputable seed companies in the country.

# Master Trainers Improving Agricultural Financial Literacy

**MARKETS II's sustainability strategy included strengthening project consultants' capacity to build their businesses by offering marketable services.**



PHOTO: MARKETS II

**Nosa Osunde, a MARKETS II NAEC master trainer, engages participants using a NAEC toolkit. MARKETS II improves the enterprise capacity of many farmer groups and processors to earn more income.**

Yinka Akinpelu and Nosa Osunde, managing directors of service providers Green Shield Technologies Limited and P3 Consulting Limited, respectively, served as NAEC master trainers, and have turned these skills into their own successful businesses. Both have trained and mentored stakeholders throughout the value chain — farmer associations, business membership organizations, community-based associations, EAs, service providers, and bank and MFI staff — to employ a commercial approach to agricultural activities. They have also worked with these groups to improve their business management via strategic thinking based on market knowledge and a better understanding of relevant value chains.

From Yinka's perspective, "The NAEC tool connects with participants' real-life experience and the methodology is very engaging." A poultry farmer who participated in the NAEC training supported Yinka's view, stating, "What struck me the most is the emphasis on recordkeeping. I realized that poor recordkeeping is the reason my business and most other businesses fail. The facilitators are my new business role models."

Yinka and GSI-Tech were contracted directly by the Foundation for Partnerships Initiatives in the Niger Delta (PIND) and its partners to build the capacity of poultry farmers in an out-grower project in Ondo state. Her company trained the Ondo state chapter of the Poultry Association of Nigeria and the Ondo State Commodity Association on enterprise development and group dynamics. Microfinance banks also contracted Nosa's company, P3 Consulting Limited, to deliver NAEC training to their staff to help them understand the business dynamics of agriculture before providing loans to farmers.

As a result of training and practical application via their consulting work, Yinka and Nosa looked inward to strengthen their companies' systems and processes. By applying the same techniques that they teach to clients, Nosa and Yinka have developed transparent, accountable, viable companies. GSI-Tech and P3 Consulting have already begun to carry out MARKETS II's capacity building and business development services, and will continue after the project ends.

# Mechanization: the Key to the Future for Farmers' Associations

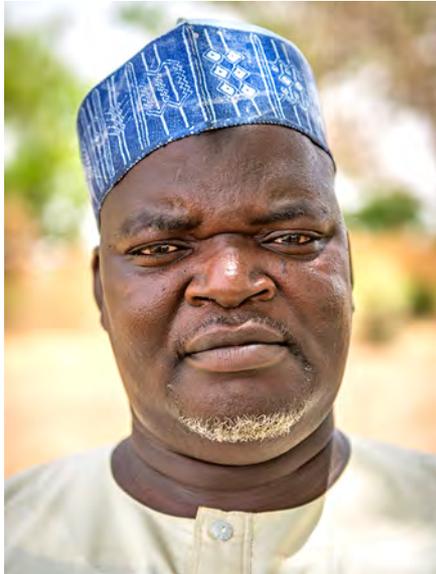


PHOTO: MARKETS II

**Kiru Fadama Multipurpose Cooperative in Kano was one of MARKETS II's first grant recipients, with the goal to help improve smallholder farmers' productivity and income.**

*"We are already well-established in sorghum, so we will expand into other crops. We want more small-scale farmers to know farming is a lucrative business. This project brought us this far, and we will ensure the impact will always be felt."*

— Ibrahim Muhammed,  
chairman of Kiru

Kiru received a tractor and tractor implements to mechanize its and its neighbors' sorghum production and processing. The group provided land preparation services to its members and non-members at 5,000 naira and 8,000 naira per hectare, respectively. Before, they had paid another tractor owner 10,000 naira per hectare to prepare their land. Kiru's chairman, Ibrahim Muhammed, declared, "This is the first time we mobilized substantive resources within such a short time. I thought this was the climax but I was wrong."

MARKETS II linked the group to Nigerian Breweries Limited in 2014, which paid them a fee to cultivate trials for two hybrid sorghum varieties on 10 hectares. Out of the four contractors for this assignment, Nigerian Breweries declared Kiru to have the highest productivity and best management practices. Ibrahim credited this to MARKETS II's best management practices training sessions. Due to Kiru's excellent performance, Nigerian Breweries registered them as official sorghum suppliers. In 2016, Kiru received another contract from Nigerian Breweries to grow sorghum on 80 hectares for 22,400,000 naira.

Kiru's stellar performance attracted the West African Agricultural Productivity Project, which engaged them to produce 10 hectares of maize foundation seed. Tecni Seed and Da-Algreen Seed sent their out-growers to learn from them, and another MARKETS II grantee in Kaduna, Anguwar Makama, visited to learn from them as well. Ibrahim noted, "Farmers' groups in this locality are always visiting us to find out why we are doing so well, and we are glad to offer our advice."

In addition to Kiru's growing reputation, individual members of the cooperative increased their farm sizes from 1 hectare to 3 hectares, thanks to the cheaper cost for land clearing and the stronger market for their produce. Kiru used the income from its tractor to buy three new threshing machines after MARKETS II demonstrated the machines' use during harvest and post-harvest and linked members to a local fabricator. In 2016, Kiru was also able to purchase a second-hand tractor to supplement the tractor received from the project. Its future plans include purchasing an additional five threshers after the 2017 harvest.



SUPPORT

## Supporting the Nigerian Government to Promote a Modern Agricultural Agenda

**Government plays an important role in promoting long-term agricultural development by creating an enabling environment for private sector growth through infrastructural investments, information sharing (i.e., research and market statistics), and fiscal policy.**

MARKETS II worked with the Nigerian government at all levels on initiatives both large and small. The project directly supported the government's Agricultural Transformation Agenda and the successive Agriculture Promotion Policy 2016-2020 – The Green Alternative, whose objectives align to make Nigeria an agriculturally industrialized economy by 2020. Both plans utilize policies, institutions, and financing structures to drive growth in Nigeria's agricultural sector. To foster strong working relationships with the government, MARKETS II employed a dedicated external relations director to communicate with and provide high-quality information to external organizations, including federal and state governments, while ensuring the technical team could focus on implementation. In this way, the project was able to work in consultation with the Federal Ministry of Agriculture and Rural Development and state ADPs to complement or leverage their activities.

The project's selection of value chains and states considered the Federal Ministry of Agriculture and Rural Development's criteria and its planned staple crop processing zones. Collaboration on GES activities included funding EA and farmer training, discussing the Agricultural Transformation Agenda's rice value chain (in addition to other value chains), and contributing to the Paddy Aggregation Center and SCPZ analyses. The project also worked with the Nigerian Meteorological Agency to share rainfall predictions in networked farmer zones and trained farmers on how to use this data effectively in their crop planning. In addition, MARKETS II supported the Central Bank of Nigeria on policy issues for agricultural lending and microfinance by participating on the bank's Microfinance Advisory Board and Banker's Subcommittee on Economic Development and Agriculture.

At the state level, the project providing capacity building and support to ADP EAs to improve their ability to service smallholder farmers. MARKETS II provided small transportation stipends to EAs to facilitate their in-person support to farmers. The project also assisted with ADP management and communications by creating a program manager position on the team. State government support, investment in agriculture, and political will were key criteria for selecting states for project activities.

## Section 2

# Increasing Prosperity Across Value Chains

MARKETS II supported seven value chains: rice, maize, soybean, sorghum, cocoa, aquaculture, and cassava. Project value chains and states were selected via an iterative assessment process during the project's initial months. Although value chains took priority in the selection process, the project also analyzed supply and demand patterns in Nigeria to determine the states in which to work. Criteria for selection included:

- *Market demand.* Overall existing market for the commodity, including processors, and value chain competitiveness.
- *Potential for growth.* Large, concentrated numbers of farmers experienced in the value chains; potential for income generation, employment, efficiency, and/or productivity gains; proximity and/or accessibility to markets and processors; potential for environmental rehabilitation and geographical spread; and size of target population.
- *Production zones for value chain in conjunction with target states.* Expanse of production zones and overlap across state boundaries.
- *Integration and complementarity.* Potential to cooperate, partner, and leverage other programs' activities and eliminate competition with other donor efforts.
- *Food security.* Basic staple crop, home consumption, storability, and nutritive value.
- *Social/broad inclusiveness.* Presence of target population, including women, youth, and other vulnerable groups, and required hectare size by farmers.
- *Low income threshold.* Low skill and capital requirement to enter, and the ability to attract capital and build skills.
- *Feasibility.* Political will and tangible support at the central and state levels, including state governments' commitment to developing agriculture and/or infrastructure, government and donor priorities and strategies, budgetary commitment/expenditure, and infrastructure.
- *Potential for innovation.* Opportunities to introduce new technologies and management practices to increase efficiency, productivity, and food security.
- *Other geographic factors.* USAID's and PIND's priority states, the Ministry of Agriculture's staple crop processing zones, and security dynamics.

Based on these criteria, the project assessed 13 value chains: millet, groundnut, sesame, maize, aquaculture (catfish), cassava, rice, sorghum, soybean, cocoa, cowpea, tomato, and onion. Cassava, sorghum, rice, aquaculture, cocoa, soybean, and maize emerged with the highest evaluation ratings, and were thus selected. Soybean and maize were selected primarily for their contributions to the aquaculture value chain,

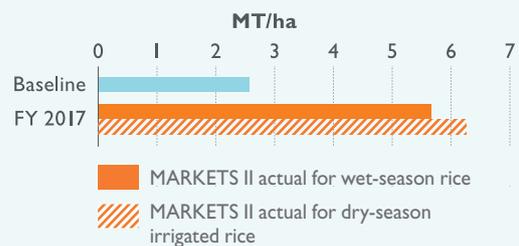
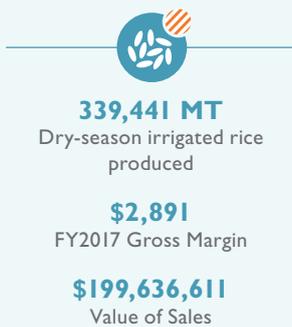
as both can be used as inputs for fish-feed production. However, they are also important for home consumption and food security.

Based on the value chains selected and the factors listed above, MARKETS II worked in the following states: Delta, Edo, Ondo, Oyo, Benue, Nassarawa, Cross River, Ebonyi, Anambra, Enugu, Lagos, Federal Capital Territory (until the end of 2014), Kwara, Kogi, Niger, Kaduna, Jigawa, Kano, Kebbi, Sokoto, and Taraba (until the end of 2015). In October 2016, the project expanded in the Niger Delta, adding Abia, Akwa Ibom, Bayelsa, Imo, and Rivers states to its program of support.



MARKETS II farmers watch Kano state rice supervisor, Lawan Muhammad Kura, demonstrate a motorized rice reaper. The project is working with microfinance bank DEC to develop agricultural mechanization loan products to meet increasing demand for small-scale equipment, such as these handheld reapers.

# RICE



## RICE

At the project's outset, Nigeria consumed at least 5.5 million metric tons of rice annually, but produced just 3 million tons. The remaining 2.5 million tons were imported, making Nigeria the largest net importer of rice in Africa and the second-largest importer in the world. Nigeria had the capacity to fulfill a larger percentage of the steadily increasing local demand for rice — if farmers would reject traditional farming methods and adopt improved practices that increased yield quantity and quality.

Although Nigerians built rice mills in response to the steady increase in rice consumption over the last decade, they were not always located based on business considerations. For example, an entrepreneur would establish rice mills in their home village, hundreds of kilometers away from most farmers who grew the commodities, creating supply chains too long to be cost effective. Additionally, many mills' established production capacity exceeded a profitable supply — they were too large, and supply was too costly to operate at a profit or at maximum capacity. Also, some entrepreneurs had limited experience in the rice value chain and did not know how to establish or maintain long-term out-grower partnerships to ensure the quality and quantity of supply required to operate effectively. Some mills were established based on the business decision to mill cheaper, imported rice, and did not see the potential opportunities for obtaining supply through local production.

In addition, the paddy that mills could access locally was of poor quality, varying varieties, and mixed with debris, and therefore costly and difficult to process (as well as potentially damaging to milling equipment). Working within this context, MARKETS II partnered with local processors to identify the varieties of rice that met consumers' quality demands, had yields that were beneficial to farmers, and produced quantities suitable for processing. As part of this process, the National Cereals Research Institute recommended varieties and provided samples to the project to test with millers. The millers then selected four varieties, which MARKETS II used to establish demonstration plots with networked farmers to measure farmers' reactions to the yields and quality. Through this process, two varieties, FARO 44 and FARO 52, became the most popular among farmers. After this first season, MARKETS II integrated the improved varieties into its POP and established linkages to seed and input (e.g., fertilizer and pesticide) suppliers. Together with the other technologies taught through the POP, MARKETS II's networked wet-season rice farmers were able to increase their average yield from 2.58 metric tons per hectare to 5.66 metric tons per hectare in the project's final year. Over the life of the project, MARKETS II wet-season rice farmers generated \$603,733,695 in cumulative sales.

Piloting improved dry-season rice cultivation in 2013 leveraged existing irrigation facilities to meet unmet demand for local paddy, helped to mitigate the potentially disastrous impact of wet-season flooding, and increased cash flow by creating an additional income stream. This was critical to supplement farmers' cash flow — the additional income stream could support essential household expenses, including inputs for the following growing season. Introducing dry-season rice cultivation allowed farmers to produce two seasons per year, more than doubling their income.

In fact, farmers found that with proper management, dry-season rice cultivation was higher-yielding and more lucrative than wet-season rice.

MARKETS II selected 3,005 farmers to pilot dry-season irrigated rice cultivation in 2013. In 2017, the project increased that number to nearly 37,000 farmers. The project could have significantly exceeded this final number due to farmer demand and buyer interest; however, the project had to balance resources for implementation in the final crop season and ensure sufficient support to close out this large five-year project. Today, dry-season farming has continued to gather momentum, with more farmers entering dry-season farming based on MARKETS II farmers' results. In the past, dry-season rice farming was seen as a waste of time and effort because of the damage caused by birds, especially in Kano (see box); low yields due to limited use of inputs; and traditional production practices. But through the use of fish nets, proper agronomic techniques, and access to irrigation, farmers and some processors feel that a dry-season rice revolution has begun and needs continued support — future projects should consider a strong dry-season staple crop component. In the final year of the project, dry-season rice cultivation yielded 6.22 metric tons per hectare. Since 2013, MARKETS II has helped networked dry-season irrigated rice farmers in Jigawa, Kano, Sokoto, and Kebbi generate an additional \$199,636,611 in cumulative sales.

#### **BORROWING FISH FARMER TECHNOLOGY FOR RICE FARMERS**

Birds are a significant issue for dry-season rice farmers in many states in northern Nigeria, especially Kano. During the dry season, the rice paddy is one of the only food source for birds. This is one of the primary reasons why farmers do not invest in dry-season rice cultivation. To combat this, MARKETS II deployed an accessible, easy to use solution: fish nets. The project taught farmers to cover their fields with fish nets, which prevent birds from accessing the grains. An additional and important benefit is that fish nets keep children in school; in the past, families had their children stay in the fields throughout the day to scare away birds.

To promote further gains in the rice sector for wet and dry season production, MARKETS II awarded grants to farmer associations to provide equipment to facilitate rice production and post-harvest handling. Examples include providing a tiller and multi-purpose thresher to the Zamare Women Fadama Farmers Cooperative Association in Kebbi state, a multi-crop thresher to the Anguwan Akawu Multipurpose Cooperative Society in Kaduna state, water pumps for irrigation to the Tondi Gada Women Multipurpose Cooperative Society in Kebbi state, and a tractor and accessories to the Anfani Kin Kpada Tifin Cooperative Farming Society in Kwara state. Grantees used the equipment to provide farm-support services to their members and the wider community for a fee, thus generating income, improving farming efficiency, reducing loss, and providing an agribusiness model for other farmer groups to follow.

To increase access to quality seed and increase farmer revenue, MARKETS II supported its strongest rice growers to become growers for seed companies. Because the selling price of seed is higher than the price for grain, this increased participating farmers' incomes and boosted farmers' access to seed. MARKETS II's involvement in improving agronomic practices, business mindsets, and business relationships has increased incomes across the rice sector in Nigeria — both for farmers and processors. For farmers, their ability to farm more effectively and have more market options has not only more than doubled their incomes, it has

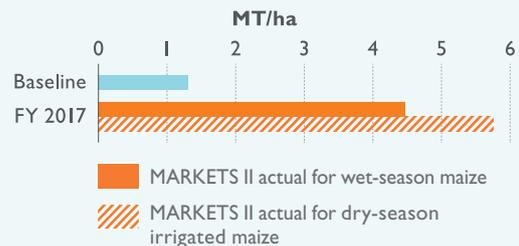
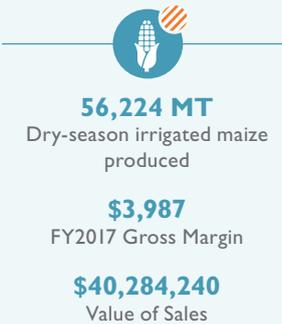
also reduced their need to find alternative sources of employment (often in the form of temporary, low-paying, and menial jobs in urban areas). With their increased income, more farmers are sending and keeping their children in school, making improvements to their homes, or investing in additional income-generating activities.

For rice millers, the higher quality and increased quantities of paddy available in the wet season and dry season has helped to ensure a more consistent and reliable supply of high-quality local paddy. In turn, millers are investing in upgrading or expanding their processing lines. For example, UMZA International in Kano state has worked with the MARKETS projects since 2010. UMZA's leaders were initially skeptical that smallholders could produce the quantity and quality of product they needed. However, today the company is expanding due to its experience with MARKETS II and its recognition of the mutually beneficial relationships it can build with smallholder farmers. The company's regular supply of paddy now comes largely from MARKETS II farmers. UMZA has also constructed a separate warehouse where MARKETS II farmers' paddy is stored prior to processing, and it added a \$2.7 million milling line with the capacity of 12 tons per hour. With this expansion, UMZA is employing 165 full-time staff, with another 1,200 part-time employees.

UMZA is not alone. MARKETS II's processing partners Labana Mills in Kebbi state, Popular Mills in Kano state, and Olam Nigeria in Nassarawa state all are in the process of expanding their processing capacity. Based on their partnership with MARKETS II, the mills recognize the value of smallholder farmers in supplying their needed paddy and are reaching out to farmers with supporting services. For example, Labana has provided motorcycles to EAs to facilitate their outreach to farmers and convenes lead farmers regularly to facilitate successful implementation of its out-grower activities (see the success story on page 77). In 2013, Olam Nigeria's out-grower scheme, which replicates aspects of the MARKETS projects' methodology, was recognized as a "catalytic innovation in African agriculture" by the Rockefeller Foundation and has continued to strongly support this approach.



Barthelom Nwonu bags certified rice seed at the Strategic Seeds headquarters in Ebonyi state. Continued support to ensure smallholder farmers' access to, and availability of, quality certified seed is required for significant expansion of Nigeria's rice sector.



## MAIZE

MARKETS II originally entered the maize value chain to secure additional local raw materials for Nigerian fish feed manufacturers, namely Grand Cereals Ltd., Novum, Feed Tech Ltd., and Durante. Maize is the main source of carbohydrates in locally manufactured commercial fish and poultry feed and is a key ingredient of floating fish feed. It is also an important component of family meals for many households.

Among the best practices promoted to farmers were optimum plant population, correct and timely application of fertilizers and agro-chemicals, crop rotation with soybeans to maintain soil fertility, use of appropriately scaled mechanized equipment, and the role of maize in a nutritious diet.

The project also conducted field tests on USG for maize production; once proven a success, MARKETS II integrated the use of USG into its maize POP. This technology saved farmers money on inputs, because it reduced the need for fertilizer application (from three times per growing season to one). To increase access to quality seed and increase farmer revenue, MARKETS II supported its strongest maize growers to become growers for seed companies. Because the selling price of seed is higher than the price for grain, this increased participating farmers' incomes and boosted farmers' access to seed.

For example, thanks to an increased supply of maize, feed producer Feed Tech Ltd. in Kaduna reliably sourced 20 tons of maize per week, up from 5 tons. The quality of its maize also increased: it was free of stones or other foreign objects that would affect the manufacturing process. With a steady source of high-quality maize, Feed Tech also built a new warehouse and invested in new machinery to increase its production capacity from 30 tons per day to nearly 100 tons per day, and plans on hiring additional employees. Feed Tech's experience with MARKETS II is another example of how a steady supply of inputs can increase private sector investments in Nigeria's agriculture sector (see box).

**“Before MARKETS II, we received 5 tons of maize weekly, but now it has grown to 20 tons weekly. There is a direct and indirect impact of this: Number one, the woman producing the maize is employed. We are employed. We have increased the capacity of our fish feed. The quality has improved. Then the fish farmer is getting good quality fish food from us, and their businesses are getting better business. The farmers are happy, we are happy, and even the fish are happy at the end of the day.”**

**— LEYE ALAYANDE, MANAGING DIRECTOR. FEED TECH**

At the project's outset, farmers were averaging only 1.31 metric tons per hectare in maize. Through the POP, training, field demonstrations, and assistance in sourcing agricultural inputs, MARKETS II yields increased to 4.48 metric tons per hectare in the final project year (among MARKETS II's smallholder wet-season maize producers). Over the life of the project, these farmers earned \$144,437,151 in cumulative sales.

Expanding into dry-season cultivation was not limited to rice. In 2014, MARKETS II introduced improved practices for dry-season irrigated maize cultivation using the project's promoted technologies to approximately 2,000 farmers in Kaduna and

Kano states. MARKETS II promoted dry-season cultivation as a way to increase smallholders' incomes, boost the supply of food during the "hunger season," and produce cash flow in time for farmers to purchase inputs for the wet season. Given the enthusiasm for dry-season maize during the pilot, MARKETS II expanded to 6,000 farmers trained on best dry-season maize production practices in 2015.

In 2016, MARKETS II increased to 10,000 networked farmers growing dry-season maize. The project began promoting short-cycle, quick-maturing maize varieties that allowed farmers to cultivate two dry-season maize crops. With three harvests — dry-season maize in April and June and wet-season maize in November — farmers now have a steady, higher income all year.

The projects' dry-season irrigated maize producers achieved yields of 5.7 metric tons per hectare in the final project year compared to the 1.31 metric tons per hectare baseline. MARKETS II's networked farmers generated \$40,284,240 in cumulative sales since 2014.

MARKETS II also increased business opportunities for women and youth in the maize value chain. For example, the project trained young sprayer teams and individuals on proper pesticide use. Micro-processing maize and other maize-based foods were smaller-scale initiatives incorporated into the MEF and nutrition training to increase food security, with the added potential to provide other employment opportunities (e.g., offering nutritious food products to families and communities). MARKETS II provided nutrition; new product development, such as maize-based foods; and small business skills training via the project's MEF and NAEC curriculum to microprocessors. For more information on the project's work to increase employment opportunities for women and youth via micro-processing and spraying services, please see Section 4.



MARKETS II maize farmers use a mechanized thresher during harvest activities in Kwanar Zangon-Aya, Kaduna state.

# SOYBEANS



**96,189 MT**

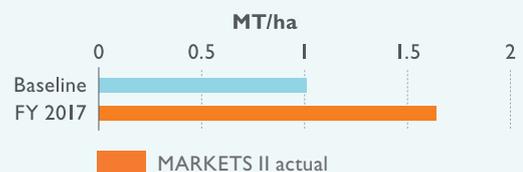
Soybean produced

**\$267**

FY2017 Gross Margin

**\$39,295,615**

Value of Sales



## SOYBEANS

Like maize, soybeans were selected as one of MARKETS II's value chains because of their potential to produce fish feed. Soy cake provides a main source of protein in local commercial fish and poultry feed, with the oil used as an edible fat. However, the potential applications for soybeans go beyond fish feed. Soy is a highly nutritious legume, and studies conducted in Benue state by the International Institute of Tropical Agriculture demonstrated that soybean-producing households that use part of the crop for household consumption have a better overall nutritional status, especially for infants. Soybeans also capture atmospheric nitrogen, thus improving soil conditions for other crops.

The project's baseline showed that farmers' average yields were low at 1.01 metric tons per hectare. In 2012, national production of only 500,000 metric tons per year was not sufficient to meet local soy consumption and millers' demands, which were growing at 30 percent and 25 percent per year for the aquaculture and poultry sectors, respectively. During this period, approximately 100,000 metric tons of soy meal was imported into Nigeria annually.

To increase soy yields, MARKETS II promoted the adoption of higher-yielding, non-shattering seeds, including TGx 1444-2E and TGx 1448-2E. (The project also tested TGx 1904-6E, TGx 1835-10E, TGx 1951-3F, and TGx 1987-62F varieties.) The project taught farmers to plant seeds 5 to 10 centimeters apart, instead of the 1-meter spacing they had previously used, thus increasing the number of plants per hectare. In addition, MARKETS II promoted the use of Rhizobium inoculation to increase nitrogen fixation, crop rotation with maize and sorghum, and harvesting from the base of the plant to leave the roots to decompose in and nourish the soil. Based on POP training and demonstration plots, MARKETS II raised the soybean yield in the final project year to 1.68 metric tons per hectare for the farmers networked into this value chain activity. Over the life of the project, these farmers generated \$39,295,615 in cumulative sales. To increase access to quality seed and increase farmers' revenue, MARKETS II supported its strongest soybean growers to become growers for seed companies, such as West African Cotton Company. Because the selling price of seed is higher than the price of grain, this increased participating farmers' incomes and boosted farmers' access to seed.

To ensure buyers were in place for farmers' increased yields, MARKETS II created linkages to Seraph Nigeria Ltd. and Hule and Sons in Benue and Niger states, and to Karma Mill Industries, Novum Agriculture Industries, FEED TECH Ltd., and Grand Cereals Ltd. in Kaduna state. Thanks to the increased and reliable supply of higher-quality soybeans, which are easier to process due to lack of stones and grit that can break processing equipment, private companies like Hule and Sons are leading the way in investing in, or expanding, their processing lines (see the success story on page 51 for details).

MARKETS II also sought to increase business opportunities for women and youth in the soy value chain. For example, the project trained young sprayer teams and individuals on proper pesticide use. In addition, the project promoted the development of beekeeping micro-businesses among women to provide soybean pollination services, as well as honey production. Micro-processing of soy into tofu

and other soy-based foods were smaller scale initiatives incorporated into the MEF and nutrition training to increase food security, with the added potential to provide other employment opportunities (e.g., offering nutritious soy-based products to families and communities). MARKETS II provided nutrition; new product development, such as soy-based foods; and small business skills training using the project's MEF and NAEC curriculum to microprocessors. (See Section 4 for more on the project's work to increase employment opportunities for women and youth via beekeeping, micro-processing, and spraying services.)



Aondowase Gaase feeds dried soybean plants into a mechanized thresher, which was provided as a grant to the Hange Farmers Multipurpose Cooperative Society in Benue state. Project-promoted improved agronomic practices and mechanization allow farmer groups to continually expand land cultivation, where environmentally appropriate, and produce crops commercially.

# SORGHUM



**186,734 MT**  
Sorghum produced

**\$455**  
FY2017 Gross Margin

**\$64,605,122**  
Value of Sales



## SORGHUM

Nigeria is one of the world's major sorghum producers, with sorghum widely grown in the North for home consumption, animal feed, and sale in domestic and regional markets. Once known as the “poor man's grain,” sorghum now has a large, robust market including flour processors, breweries, and export to West African countries.

Sorghum is the oldest commodity of MARKETS' value chains. MARKETS II built on well-established relationships with sorghum processors to expand successes achieved under MARKETS and Bridge to MARKETS 2 to more farmers. For example, under MARKETS and Bridge to MARKETS 2, the project worked with Nigerian Breweries Plc to develop and promote a higher-yielding white sorghum variety suitable for malting, increasing yields to an average of 2.4 metric tons per hectare (twice the national average) for more than 10,000 project-networked farmers. However, the achieved yield improvement was close to the maximum potential of the available open-pollinated varieties.

To achieve continued yield increases, MARKETS II worked with Nigerian Breweries Plc to develop hybrid sorghum varieties with a potential yield of up to 4 metric tons per hectare. The project assisted Nigerian Breweries Plc's Aba Malting Plant in test-growing two new hybrids by project out-growers in Kaduna. In 2014, MARKETS II linked Nigerian Breweries Plc to Kiru Fadama Multipurpose Cooperative in Kano, a longtime MARKETS II farmer group and recipient of a tractor via a MARKETS II grant. Kiru was one of four groups that Nigerian Breweries Plc hired to conduct field trials on 10 hectares of the new sorghum variety — the others were large research institutions and agribusinesses. Kiru outperformed the other three entities, achieving the highest yield in the trial. Based on this positive experience, in 2016, Nigerian Breweries Plc hired Kiru to plant another 80 hectares. In 2015, another MARKETS II-supported farmer group, Anguwar Makama Danlawal Multipurpose Cooperative Society in Kaduna state, also received a contract with Nigerian Breweries Plc to cultivate 10 hectares of hybrid sorghum, expanding to 70 hectares in 2016.

The project taught farmers to use high-malt seed varieties and thin their sorghum stands to two per hill. In addition, the project promoted using fertilizer for sorghum, a departure from traditional practice that dictates that sorghum does not need fertilizer to grow. To improve soil fertility, striga weed control, and environmentally friendly methods, the project also encouraged rotation with leguminous crops, such as cowpea and soy. In addition to MARKETS II grantees Kiru and Danlawal, which each received a tractor, the project provided a mechanized thresher to Magami Yandankali Gwarmai Fadama Farmers' Cooperative Society Ltd in Kano, five water pumps to Marina Multipurpose Cooperative Society in Kaduna, and a mechanized thresher to Anguwan Akawu Multipurpose Cooperative Society in Kaduna.

MARKETS II-networked farmers increased their yields from 1.08 metric tons per hectare at the baseline to ranging between 2.1 and 2.32 metric tons per hectare over the life of the project, earning a total sale of \$64,605,122 during the five-year period.

# AQUACULTURE



**128,948 MT**  
Fish produced

**\$40,581**  
FY2017 Gross Margin

**\$303,546,399**  
Value of Sales



## AQUACULTURE

According to the project’s initial aquaculture value chain assessment, fish was one of the main sources of animal protein in Nigeria, and approximately half of all fish consumed is locally produced. At the project’s outset, Nigeria’s aquaculture sector had been growing at a rate of more than 30 percent per year, driven by dwindling natural fish stocks, import substitution opportunities, and a strong local market reflecting the increased protein consumption that comes with rising incomes. This translates to significant opportunities for small- and medium-size fish farmers to create profitable aquaculture ventures.

MARKETS II’s primary aquaculture task was to convert ad hoc rearing practices into commercial fish farming. This required a precise fish-feeding regime, with specific feed quality, quantities, and timing, depending on the life cycle of the fish. It also required water quality management, healthy and productive fingerlings, protection from bird predation, and good pond cleaning and sanitation

practices. In the past, fish farmers would feed fish based on what was available on their farm, including dead animals or food scraps. These poor practices led to disease, limited and/or inconsistent fish weight gain, higher mortality rates, and water quality problems, coupled with limited planning issues because farmers did not know their production levels, inputs costs, or whether they would make a profit. Because of the cost of quality feed — typically 60 percent to 70 percent of the cost of raising fish — a key challenge was convincing fish farmers that adopting a feeding regime using quality feed consistently would produce table-weight fish at a profitable cost. Given the high cost of imported feed, MARKETS II promoted the production of local fish feed through its efforts with soy and maize value chains. The project also promoted floating fish feed to eliminate feed wastage and reduce costs and pond fouling. In addition, the project explored using locally produced insect protein as a substitute for imported, expensive fish meal protein.

### LOCALLY PRODUCED INSECT PROTEIN

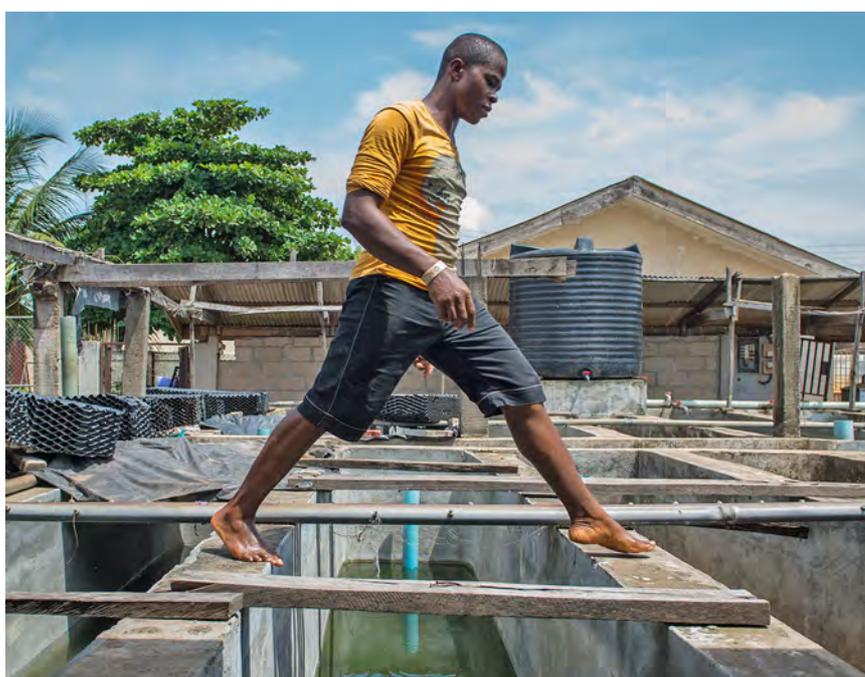
MARKETS II piloted the use of insect protein (black soldier fly) as a local, lower-cost, innovative substitute to expensive, imported fishmeal for fish and poultry feed. The project supported partners to establish pilot sites in Edo, Delta, and Ondo states, and the Federal Capital Territory. The objectives of black soldier fly maggot production are to decrease the cost of feed for fish and poultry farmers and to establish a basis for potential local business opportunities related to feed production and distribution.

Proper feeding techniques were a key component to MARKETS II’s aquaculture POP. Farmers learned which type of fish food to use at each stage of development and how to weigh fish to determine how much food they needed. The POP also included water quality management practices, such as the frequency with which to change pond water and how to dispose of wastewater. In addition, the POP guided farmers on selecting fingerlings as stock. Fingerlings are the “seeds” in aquaculture — healthy baby fish are required to produce healthy adult fish. To increase the availability of better-quality fingerlings, MARKETS II issued grants to eight hatcheries to procure equipment to more than double their productivity. Equipment included collapsible tanks, aerators, water heaters, adjustable fish graders, generators, water quality test kits, water pumps, and others. The project complemented this support with NAEC and MEF business training, technical training on hatcheries production and management, hands-on coaching and mentoring, and exchange visits to promote peer-to-peer learning.

To increase value-added market opportunities for fish producers, MARKETS II also promoted small-scale processing through improved smoking kilns. At the market end of the value chain, prices of live catfish are controlled by intermediary traders. In certain markets, fish farmers have limited leverage for negotiating fresh fish prices because organized traders fix market prices. Continued feeding of adult fish does not lead to increased weight gain, and holding onto fish in hopes of a better price will only lead to losses for the farmer. To address this issue, MARKETS II promoted small-scale catfish smoking and smoking services so that farmers could process fish and sell them directly to an end market. Smoked fish can garner up to six times the price of fresh fish and have a longer shelf life.

To further broaden producers' business opportunities, MARKETS II promoted using pond wastewater for vegetable gardening as an additional business and household nutrition opportunity. MARKETS II also expanded its support beyond catfish to tilapia production in the latter stages of the project, catering to consumers who preferred a scaled fish.

Most of MARKETS II's aquaculture work took place in the South West, Niger Delta, and South East. MARKETS II also supported aquaculture in the northern region in Kano, Kaduna, Jigawa, and Sokoto states, in collaboration with Kano Fisheries Institute, Grand Cereals Ltd, and state ADPs. The project provided training-of-trainers workshops for Kano Fisheries Institute instructors on the project's POP and NAEC. These instructors then provided POP and NAEC training sessions to their students. Aquaculture activities in the northern region ran for 1.5 years since it was more cost-effective to increase aquaculture activities in the southern region, where fish farming is not as widely dispersed. The project also provided ad hoc support to original MARKETS fish farmers in Lagos, Osun, and Ogun states. MARKETS II supported fish farmers to achieve \$303,546,399 in sales over the life of the project.



Catfish hatchery operations officer, Olusola Balogun, steps over a tank on his way to feed juvenile fish at a MARKETS II hatchery grantee: Hofete Farm in Asaba, Delta State. The project responded to a supply gap in quality fingerlings and juveniles by providing eight grants to hatcheries throughout the Niger Delta, doubling their production and improving their hatchery quality and management.

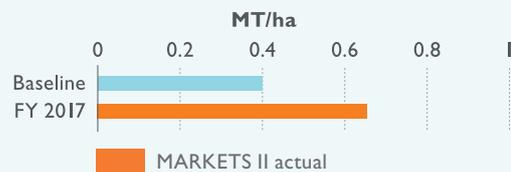
# COCOA



**123,447 MT**  
Cocoa produced

**\$1,007**  
FY2017 Gross Margin

**\$320,394,811**  
Value of Sales



## COCOA

Once the world's largest cocoa producer, Nigeria has slipped in its rankings due to outdated practices and aging trees. Many of the cocoa trees in Nigeria are older than the farmers who own them. But cocoa remains an important facet of the Nigerian economy — it is the second-largest foreign currency earner besides oil.

Given the prevalence of older plantations, limited investment in replanting new trees or new plantations, and the time it would take for new plantations to become productive, MARKETS II focused on activities that would have a meaningful impact within the life of the project. The project team helped farmers maximize productivity in existing trees; reduce post-harvest losses; maintain cocoa bean quality; and adhere to international standards required by certification bodies like Utz, Rainforest Alliance, and Fair Trade International. Although sales of certified, sustainable cocoa represent only a small percentage of global sales each year, that percentage is growing, and certified cocoa commands a higher price. In addition, carrying out practices necessary to achieve certification would help farmers improve the quality and quantity of their harvests. MARKETS II worked with large agro-trader exporters — such as Multi-Trex Integrated Foods Plc, Armajaro Nigeria Ltd, ECOM Trading, and Agro-Traders — to support their efforts to introduce traceability and certification procedures to meet international standards.

MARKETS II helped increase productivity and access to quality inputs by promoting the adoption of improved seedlings, correct plant spacing, nursery establishment and management, and appropriate fertilizer and pesticide use. To increase yields despite aging trees, MARKETS II also trained farmers in grafting techniques and pruning to promote the growth of new branches and decrease the incidence of fungal diseases through increased exposure to sunlight. The project also promoted inter-cropping with plantain trees to provide shade for the newer cocoa trees and boost income for farmers at the early stages of their plantations.

Post-harvest handling is crucial for cocoa to maintain quality and reduce loss. MARKETS II promoted three simple techniques through its POP to minimize losses during post-harvest handling processes. First, the project trained farmers to break open cocoa pods using wooden mallets. Farmers previously had used machetes to open the pods; this allowed the transfer of diseases from one pod to another. Second, farmers learned to use elevated trays for fermentation to allow air to flow above and under the beans. Their previous practice of fermenting in heaps on the ground had led to losses of up to 30 percent due to pressure and poor airflow for beans. Third, MARKETS II promoted the use of raised platforms for drying, instead of drying on the ground. This enhanced even and faster drying, resulting in reduced loss and a higher-quality product free of mold, dirt, and rocks for which buyers would pay a premium.

To further broaden producer business opportunities, the project promoted small beekeeping businesses, particularly among women, for cocoa pollination and honey production. MARKETS II trained selected cocoa producers to establish and manage cocoa nursery businesses. Additionally, project staff trained youth and adults to serve as spray service providers for pesticide application.

Through its grants program, MARKETS II awarded four in-kind grants to cocoa producer associations to supply agro-chemical motorized sprayers to farmer cooperatives in three states. This improved farm mechanization and productivity, provided employment opportunities to youth, and served as a model for other groups. Grantees nominated 10 to 20 young people, who received training in using the equipment, set up steering committees to manage the equipment, and purchased personal protective equipment for the sprayers' safety. In addition to creating youth employment opportunities, the motorized sprayers reduced wastage of agro-chemicals and provided an income source for producer associations.

Through MARKETS II's support, networked farmers increased productivity from 0.4 metric tons per hectare at baseline to 0.65 metric tons per hectare in the project's final year, earning \$320,394,811 in sales during the five-year project period. In addition, 14,996 producers received international certification, with an additional 1,005 farmers expecting certification in November 2017.



Farmers Olufemi Osatuyi (left) and Vivian Obukuta (right) check cocoa beans on a project-recommended raised drying platform at Adejebu Cocoa Farm in Ondo State. MARKETS II recommends appropriate, affordable technologies to assist cocoa farmers to meet international cocoa certification standards.

# CASSAVA



**529,999 MT**  
Cassava produced

**\$861**  
FY2017 Gross Margin

**\$38,771,723**  
Value of Sales



## CASSAVA

Nigeria is the world's largest cassava producer, and the crop is integral to the country's food security, with many Nigerians eating cassava daily. The broad agro-ecological adaptability of cassava allows farmers to produce reasonable yields where other crops cannot grow. Although cassava grows relatively easily, the long period of time from planting to harvest (18 months to three years) and extreme perishability (in as little as 48 hours after harvest) present challenges to developing the cassava value chain. Farmers who use few or no inputs have low productivity but are still subject to high manual labor costs for harvests, resulting in low profits or losses.

“Last year, we did some volunteering in one of our local government areas in Enugu State. They were doing cassava farming, and we felt they were not doing it well. And when we told [the local government chairman] about what we're doing with **MARKETS II**, he asked us to come along to help him. And we told him, ‘We were going to do just volunteering, we're not charging you anything.’ We helped to arrange the farmers, form them into cooperatives, in the Udenu Local Government Area. We helped them source quality cassava stems and taught agronomic processes in the area of cassava.

Today, they have very fine cassava farms in that area to the extent that the local government's people are now asking more and more people to come and join. And they're also thinking of installing a processing plant that will process the cassava into garri or into starch. In fact, the government has now built an access road into that community as a result of the volunteering.”

— PROFESSOR GERALDINE UGWUONAH,  
MANAGING DIRECTOR OF REMIF REMS  
NIGERIA LIMITED, A KEY SERVICE PROVIDER  
FOR **MARKETS II**

More than 85 percent of cassava produced in Nigeria is sold by farmers to small and micro-processors of garri and fufu, which can absorb high farm gate prices and transfer the cost to consumers. Farmers generally prefer selling to smaller processors because they receive a higher price; smaller processors are closer to the farms, so they are more convenient, have lower transport costs, and require smaller quantities. Cassava has many industrial processing opportunities, such as high-quality cassava flour as a substitute for imported wheat in bakery products, glucose syrup, ethanol, and starch. However, large processors cannot afford the higher cassava prices that smaller-scale processors can absorb due to large processors' higher overhead and transport costs; many operate significantly below their installed capacity. Large processors cannot afford to increase prices to the final consumer because of competition with imported cassava products from Thailand and Vietnam — once the price of cassava root reached a certain threshold, locally processed cassava would become more expensive than imports.

Given the importance of cassava to food security, its multiple industrial uses, and its widespread production in Niger Delta states, the project selected cassava as a value chain. **MARKETS II** focused on increasing productivity to increase farmer incomes and availability of cassava for both small and large processors. Similar to all of its value chains, **MARKETS II** developed a POP for cassava and delivered group dynamics, leadership, and business development training to farmer associations. In

particular, the project promoted the use of high-yielding stem cuttings planting in ridges instead of mounds, proper plant spacing, and timely fertilizer application. MARKETS II promoted the use of improved high-starch content varieties of cassava that mature in 10 to 12 months. The project also promoted intercropping with short-cycle, revenue-generating, and soil-enriching crops, such as cowpea or melon. Another business opportunity encouraged women and youth to produce and sell improved varieties of cassava stems as planting material.

Through these interventions, MARKETS II's networked farmers improved their production from 11.18 metric tons per hectare at baseline to 22.76 metric tons per hectare in the final year of the project. These farmers generated \$38,771,723 in sales throughout the life of the project.

To increase market demand, MARKETS II strengthened the business operations of small-scale garri and fufu processors (see the success story on page 54), and worked with large processors — such as Thai Farm International Ltd., Matna Foods Ltd., Idaewor Farm Ltd., Lentus Food & Agro Ltd., Niji Foods Ltd., and Allied Atlantic Distilleries Ltd. — to develop out-grower schemes in Oyo state and the Niger Delta. Processors provided inputs and opportunities to rent tractors or trucks to facilitate crop management and delivery.

Similar to MARKETS II's other value chains, processors in the cassava value chain are now making new investments to increase their capacity. For example, Allied Atlantic Distilleries Ltd. in Ogun state is building a new plant to increase its capacity for ethanol production from 9 million liters per year to 22.5 million liters per year. To support its expansion program, the company also plans to establish a 5,000 hectare farm in Oyo state to be managed in collaboration with local farmers.



In addition to improved agronomic practices to increase cassava crop yields, MARKETS II addressed challenges in the value chain by creating opportunities — such as cassava stem multiplication to increase the supply of high-quality planting material and small-scale processing to add value and increase income.

## SNAPSHOT

# Strengthening Farmers' Associations and Expanding Reach

**Located in Kwara, Anfani Kin Kpada Tifin Cooperative Farming Society Limited struggled to make farming a viable business. When MARKETS II began in 2012, Anfani's members registered as MARKETS II "networked" farmers.**



PHOTO: MARKETS II

**Anfani proudly presents the tractor provided as a grant by the project. The group's chairmen confirmed that MARKETS II has changed their lives.**

*"We were properly trained on how to operate and use the tractor for business. With the tractor grant, we increased production and provided services to other farmers. In less than one year, we generated more than 2 million naira from tractor services."*

*— Abdul Anfani Kpada,  
Anfani chairman*

The MARKETS II team demonstrated and reinforced best agronomic and management practices, focusing on agriculture as a business, including land preparation, quality seed and input usage, group dynamic techniques, and methods for supporting farmers. The project also facilitated linkages to value chain actors, such as seed and fertilizer suppliers, processors, and credit facilities.

Neighboring farmers noticed Anfani's fields and success. As a result, the cooperative grew from 45 members to 119 members. The group's visible achievements, its membership expansion to farmers in neighboring communities, and the credibility it gives to farmers have significantly increased the cooperative's influence to improve non-members' practices.

Through increased membership and MARKETS II's linkages and capacity support, the cooperative reduced production costs via negotiations for agrochemicals and fertilizer from Syngenta and Notore. In 2013, Anfani purchased a rice planter from the National Centre for Agricultural Mechanization, reducing the labor required for proper rice seed planting. As a result of Anfani's progress, the project awarded a tractor grant to the group in February 2016.

The impact of new technology, including the tractor, was substantial. By acquiring a tractor, the cooperative has created new business opportunities, such as loading sand for builders, transporting farm produce, and supplying water to farms. In 2017, it earned 1,970,000 naira between February and July. The cooperative had 4 hectares in 2009, grew to 5 hectares in 2012, and now owns 10 hectares. Group members' individual land under cultivation grew from 1 to 4 hectares per farmer. Members' yields increased from less than 2 tons per hectare to more than 5 tons per hectare.

Anfani's chairman, Abdul Anfani Kpada, confirmed that members' lives have significantly improved, and the cooperative is prepared to run effectively when the project ends. "We can send our children to quality schools, build houses, and reduce labor cost and drudgery. I have two children in higher institutions. It was almost impossible for a farmer to send their children to the university in this community. We are thankful to MARKETS II for turning our lives around."

## The Dry Season Revolution

**Tabawa Hamza has been farming for more than 20 years, growing maize, cowpea, cabbage, and tomatoes.**



PHOTO: MARKETS II

Lead farmer, Tabawa Hamza, at the Bunkure Unguwan Rimi dry-season maize demonstration plot. Since she became a lead farmer transferring **MARKETS II's** recommended technologies to her group members, the group's success has allowed them to expand from cultivating 0.4 hectares to four hectares.

Eight years ago, Tabawa made the venture into dry-season maize farming. Despite her years of experience, Tabawa employed traditional agricultural practices and her crops produced poor yields year after year.

This changed in 2017, when she was selected to attend a **MARKETS II** dry-season maize training. Tabawa, as the lead farmer of the Bunkure Unguwan Rimi Groundnut Oil and Milk Farmers' Cooperative Society in Bunkure local government area, was nervous that she would disappoint her association, but this was not the case. Tabawa received training on the **MARKETS II** POP and quickly transferred those teachings to her group.

On her own half hectare of land, she increased her yield from six to 16 bags, which she was able to sell for an average of 60 naira per cob at the market — by far her most successful season of farming.

As a result of her success, Tabawa has thrived. She was able to support her husband in building their new house, she assisted in paying the school fees for her six children, and she purchased new clothes for them during festivities. Other farmers continue to seek Tabawa's advice and guidance on how to prepare for the coming season.

Tabawa stated that she is very happy with her increase in earnings and has promised to continue disseminating her newly acquired knowledge to other maize farmers so they can realize the same success.

## Hule and Sons Succeed with Soybeans

**Ndyerkaa Hule saw an opportunity in the market and became a local buying agent for soybean processors within and outside of the state of Benue. This led him to create Hule and Sons Nigeria Limited, a soybean processing company, in 2009.**



PHOTO: MARKETS II

Hule and Sons’ managing director, Ndyerkaa Hule, appreciates farmers and quality soybeans, which has helped the company develop mutually beneficial relationships. He understands that farmers need money rather than delayed invoice payments, so he ensures cash payments upon grain delivery. Farmers know that Hule will pay immediately and fairly, and Hule knows he will receive consistently good-quality, clean grain.

Initially, Hule and Sons had to source its grains in the open market, but it encountered major resource issues. The company paid high prices to middlemen for low-quality raw materials. Because the farmers were scattered around the area, Hule and company faced high transportation costs and logistical challenges when collecting produce. Additionally, poor post-harvest practices and lack of trusted producer-buyer relationships led to Hule purchasing from the open traditional market, resulting in a product mixed with stones and sand, which wasted time and resources to separate out soybeans and repair damaged machines.

MARKETS II’s interrelated strategies became the cornerstone of opportunity for Hule and Sons and MARKETS II farmers. The project helped its networked farmers partner with reliable off-takers who buy at a competitive price to increase their access to high-quality grains, and supported networked farmers to implement best agriculture and management practices using the project’s POP. In 2012, MARKETS II and Hule and Sons signed an IA to close the gap between MARKETS II farmers’ need for consistent sales at a profitable price and the company’s need for high-quality soybeans.

As a MARKETS II partner, Hule and Sons learned about the safe use of agrochemicals and environmentally friendly mill practices. MARKETS II also supported the company in accessing bank loans to scale up their business. Hule and Sons collaborated with MARKETS II-trained EAs from the Benue State Agricultural and Rural Development Agency to ensure that out-growers applied MARKETS II’s agronomic practices and to communicate buyback information to farmers. Since working with MARKETS II, the mill’s processing capacity has increased from 50 to 150 tons per day, grown from 32 to 72 staff (45 full-time), and expanded from 4,000 to 6,000 out-growers.

Hule and Sons has expanded beyond Benue and supplies raw material to feed mills nationally. Hule plans to acquire equipment to refine soya oil and grind soy into livestock feed, and is meeting with investors as a result of visibility from the MARKETS II partnership. Per Hule, “We no longer go outside to look for raw materials because MARKETS II-trained farmers give us quality grain for processing. The cost of repairing our machines due to damage caused by grain and stone mixed with seeds has reduced, and we are no longer exploited by middlemen. We could not have achieved this without MARKETS II.”

# Nigerian Breweries and the Sorghum Alternative

**Nigerian Breweries is a well-known beverage company established in 1949. The initial MARKETS project started collaboration with Nigerian Breweries on the sorghum value chain in 2005.**



PHOTO: MARKETS II

Henk Wymenga, technical director of Nigerian Breweries, describes MARKETS II's key role as being “an independent and objective scientific interface, cultural interface, and agricultural interface between us [and farmers]...We're brewers, we're not agricultural specialists, and having [MARKETS II] as a good listening ear and partner was key.”

As a major brewer in Nigeria, the company was keen to develop a viable local raw material value stream to reduce the cost on importation and foreign exchange demand. With the help of MARKETS II, Nigerian Breweries has made valuable contributions to the sorghum value chain. The company purchased 30,000 metric tons of sorghum at the start of their large-scale sorghum production. Today, purchasing has increased to more than 100,000 metric tons of sorghum per year. This very significant increase is a result of the collaboration between many stakeholders, including MARKETS II, whose role, according to the technical director, Henk Wymenga, “has been very effective.”

While the company focused on its primary objective of brewing, MARKETS II has helped them ensure that farmers supply high-quality sorghum grains to meet industry requirements. With support from the International Agricultural Research Institute and MARKETS II, Nigerian Breweries has developed two high-yielding seed varieties known as Corporate Social Responsibility One and Two. Additional two hybrid seeds were being developed and tested in 2015. The Federal Ministry of Agriculture and Rural Development recently signed a memorandum of understanding with Nigerian Breweries to allow the Nigerian government access to the technology behind the seeds. This has the potential to double national production from 10 million metric tons per year to 20 million tons.

Nigerian Breweries' production policy is to include 60 percent sorghum in its products sold across Africa. With ample availability of sorghum in Nigeria, there is a comparative advantage for Nigerian farmers to produce for the company. With the new availability of high-quality sorghum in the local market, Nigerian Breweries now depends less on the import of raw materials, and it is not disturbed by foreign exchange fluctuations. As Henk remarked, “Nigerian Breweries has more than 2,000 Nigerian staff, which demonstrates high local content. We also have more than 65 stock-keeping units.”

Small-holder out-growers have largely benefited from producing grains for Nigerian Breweries. Many now can afford health care, pay their children school fees, expand their production, and engage in more socially responsible practices in their communities.

# From Subsistence to Production and Processing

**Greenland Fish Processing Cooperative and Multipurpose Society Limited wanted to make money from aquaculture but did not know how. It experienced high fish mortality as a result of poor practices, such as using dead poultry for feed and low-quality fingerlings.**



PHOTO: MARKETS II

Greenland catfish farmers feed their fish with high-quality fish feed. Proper feeding practices, in addition to best-practice pond management and value addition, lead to increased harvest and income.

Greenland earned very little return on investment, and fish farming was not as lucrative as it had hoped. This all changed after 2014, when it began to participate in MARKETS II. The project trained catfish farmers using the aquaculture POP to increase production, reduce mortality, and improve the shelf life of catfish through introducing efficient, environmentally friendly smoking kilns. Afterwards, Greenland improved in proper feeding according to weight, good pond management practices (including using nets and lime), weighing fish before sale, recordkeeping, post-harvest practices, and packaging.

MARKETS II also linked Greenland to Skretting, an international feed company, to give feed to farmers on credit to reduce production costs. The ability to receive inputs on credit, and the implementation of MARKETS II practices, changed how Greenland operates as a business and transformed it into a successful cooperative. The project's best practices helped it to harvest more than 95 percent of its stock during the last harvest in 2016. Before MARKETS II, the group's cluster farm had a capacity for 500 to 1,000 juvenile fish. After, in 2016, the group expanded its cluster farm to 5,000 juvenile fish capacity based on its success in reducing fish mortality.

But improving fish survival is only one piece of the puzzle. Selling live fish can be a challenge: fish buyers offer low prices for table-size, live fish, knowing farmers are desperate to sell at harvest. Training on fish smoking has given Greenland an advantage. Greenland's secretary, Bukola Oladapo, said, "When we smoke fish, we get a better deal... [From my ponds,] I made 300,000 naira in profit in the last harvest cycle of 2016. If I sold the wet fish, I would not make even 100,000 naira in profit."

Greenland fish farmers have moved from subsistence fish farming to commercial fish production and processing, resulting in improved incomes and livelihoods for members and their families. Bukola said, "We used to boast that we understand fish farming, but MARKETS II has exposed our errors and added value to us. They visit our ponds to teach us regularly. My bank account is loaded. Fish farming is the only thing I do and it takes care of my family... I can easily pay bills for my family because I am a lot [more] comfortable. We would love to continue learning new fish-farming techniques from MARKETS II. We don't want the project to end."

## Business Dreams Come True for Youth

**In 2013, 26-year-old Simon Ocheni started a business with just \$8. Today, that investment is a thriving business that has jumpstarted his dream to feed the world.**



PHOTO: MARKETS II

Simon Ocheni's business has been booming since he began implementing the business practices taught by MARKETS II. Here, Simon shows off the equipment he purchased for his new factory in Kogi state.

Simon produces and sells garri, a West African snack or light meal made from cassava, a common crop in Nigeria. Garri can be served many ways, making it an inexpensive, flexible food. Simon started by packaging simple packets that sold for about \$1. He found his customers wanted variety, so he developed packets with mix-ins like peanuts, sugar, and powdered milk. He has made a profit of 60 cents per bag.

Starting a food product business was not Simon's original plan, as he earned his university degree in computer science. He started his business during his national service period, when he worked as an information technology specialist on a military base. Attending a MARKETS II training for selected national service participants ignited his passion for business. In a difficult economy, Simon saw a great opportunity for self-employment.

Simon said the MARKETS II training gave him the confidence to stick with his business to see where it could take him. "It helped me look at the challenges I would face," he said. "Without the training, I would have just said, 'Forget it, there's too much competition.'" Simon said he learned about the need to protect his ideas and his products from people who would copy it. He also learned the basics about managing a business, from recordkeeping to market analysis and planning.

As his business developed, Simon was invited to a small business exhibition, where he encountered bank officials who thought he had potential. Armed with a loan of nearly \$24,000, Simon opened a factory in Kogi, where he could boost his production and expand his business. His factory is situated so that he can purchase raw cassava directly from neighboring farmers. He now employs 14 people, and recently secured a contract to provide his product to the local national service headquarters. In five years, Simon wants to expand his factory and offer a wider range of products. He hopes to sell to distributors and large-volume clients. All of his success contributes to his mission to feed the world. "It's just like a dream," he said.

## The Business Potential of Bees

**Bargong Farms Limited saw a honey production gap in Nigeria’s market. In 2008, it began a small honey-processing business, working with beekeepers who earned 250 naira per liter.**

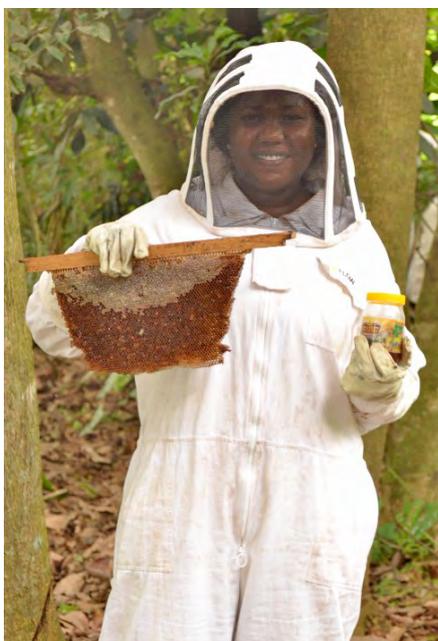


PHOTO: MARKETS II

**With support from MARKETS II, Bargong Farms Limited has become a stronger organization working with 1,200 beekeepers, who now earn 700 naira per liter.**

*“The introduction of the demonstration apiary has enabled stronger beekeeping groups to mentor others. We provided each beekeeper group with three beehives, bee colonies, and two sets of beekeeping equipment for this purpose. The demo apiary has become a learning center for community beekeepers.”*

— David Musa,  
managing director of Bargong

MARKETS II saw the potential for bee pollination services for its networked cocoa and soybean farmers, with honey production as an additional revenue source. In 2014, MARKETS II and Bargong began working together to develop beekeeping business opportunities. Proper beekeeping practices can be time consuming, but do not require much land or money. This was appealing to women and youth, as both groups generally lack access to these resources. Bargong mitigated security concerns by introducing flow hive technology, which is less labor-intensive and can be located close to home and maintained anytime, rather than the traditional practice of going to the fields at night.

Under MARKETS II, Bargong provided beekeeper training to 1,188 farmers, focusing on husbandry, beehive use and maintenance, and recordkeeping. Of these trainees, 296 were trained as pollination service delivery agents. Beekeepers were assisted to form 26 beekeeper cooperative associations, 13 of which were women’s groups.

MARKETS II-trained beekeepers now manage 570 cooperative hives and 114 individual hives. Since MARKETS II began its beekeeping activities in 2014, beneficiaries have produced honey and bee hive products (e.g., wax and pollen) for six harvesting seasons. Beekeepers have earned between 9,000 naira to 15,000 naira per hive per honey cycle, which occurs twice a year. Women comprise 90 percent of project-trained beekeepers and 95 percent of pollinators.

Bargong’s company has dramatically evolved since working with MARKETS II and adopting MARKETS II best practices, such as effective monitoring and evaluation, good recordkeeping, and improved organizational processes. Bargong is now recognized by the Nigerian government as a valuable actor in expanding the potential for bee products in Nigeria. The FMARD and the Nigeria Export Promotion Council are currently developing certification criteria for exporting bee products, including honey, to the European Union. To support this effort, in July 2017, Bargong held a workshop for Nigerian beekeepers, including those trained under MARKETS II, on eligibility criteria for honey export certification.



## Engaging Service Providers

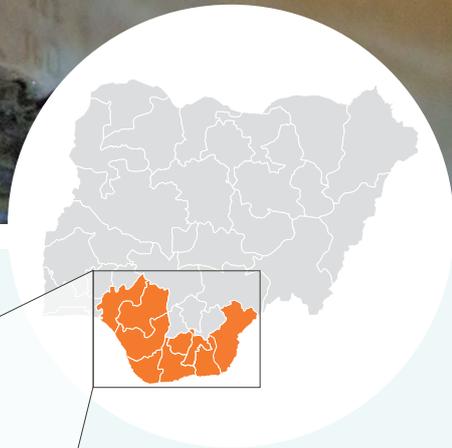
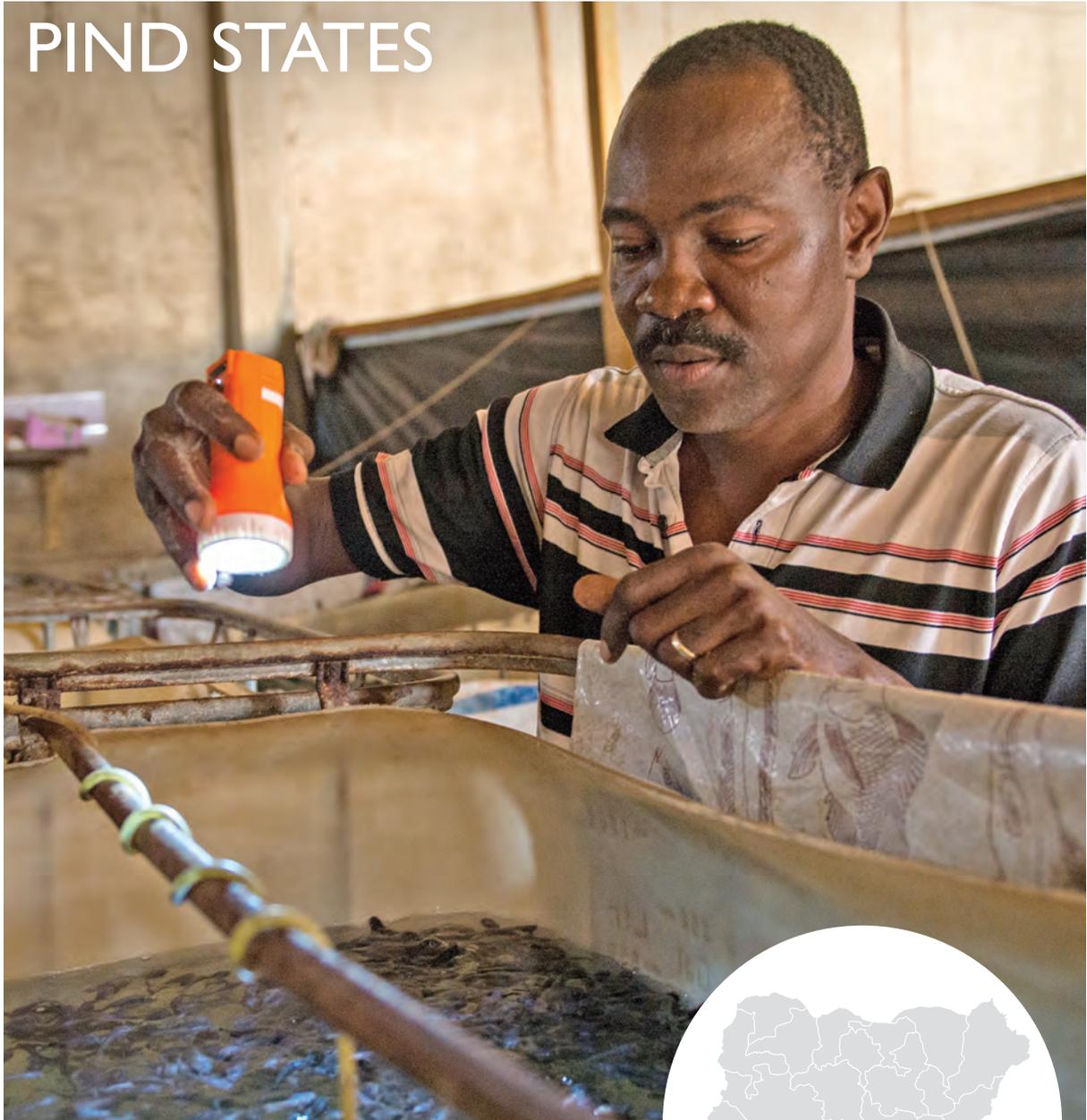
**Service providers were the first “rung” in MARKETS II’s process of stepping down training and expertise to small-holder farmers in Nigeria.**

MARKETS II engaged service providers through a competitive RFP process for each value chain to carry out field interventions with state ADP extension staff to reach farmers, identified groups, and associations. Relevant MARKETS II technical staff supervised their activities to ensure that the POP and technologies promoted by MARKETS II were appropriately deployed, and that farmers and partners, including processors, received the required results and benefits.

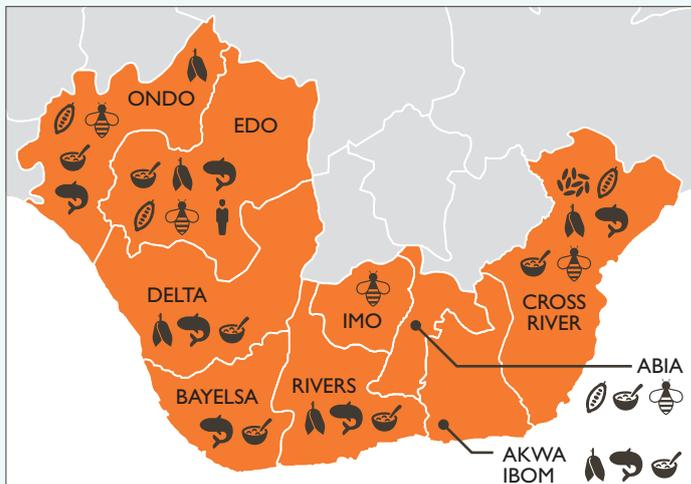
In addition to subcontracting to service providers throughout the project, MARKETS II provided critical capacity-building assistance to them. Using USAID’s Organizational Capacity Assessment Tool, MARKETS II performed periodic assessments of service providers’ capacity and practices in areas ranging from financial management to governance structures to human resources systems to identify capacity gaps and areas for improvement. For example, after one assessment, Kano-based service provider Sasakawa Global 2000 update its procurement systems and hired a procurement officer, took a more proactive approach to hiring women to improve gender balance, and refined its organizational structure. MARKETS II also provided monitoring and evaluation training to build service providers’ capacity and ensure that their reported numbers were accurate.

MARKETS II’s sustainability strategy depended, in part, on helping local private sector institutions and NGOs build capacity and experience in providing technical support services in the agricultural sector. Although most smallholder farmers are not yet in a position to pay for private extension services, the project’s service providers are already taking on new clients. For example, IFAD, NIRSAL, and private sector processors requested recommendations on which of our subcontractors could support their projects, as well as guidance on how MARKETS II is managing its subcontractor systems. On the private sector side, all of the stakeholder off-takers are aware of the role that local service providers play in the project’s technical efforts. The service providers are present and contribute to project off-taker planning, review, technical, and buy-back meetings. MARKETS II foresees that a significant number of its value chain off-taker partners will engage service providers to continue their extension activities. Finally, some of the service providers, such as DDI and Remif REMS, are establishing small farm-service businesses, such as farm equipment rentals, to continually provide services to farmers.

# PIND STATES



## AREAS OF INTERVENTION



- Rice
- Cocoa
- Cassava
- Internally displaced persons
- Aquaculture
- MEF/Nutrition/Homestead Farming
- Beekeeping

### Section 3

# Working with PIND in the Niger Delta

MARKETS II worked in partnership with the PIND Foundation as part of its Developing Market Alliances in the Niger Delta Region, which brought together PIND, the U.K. Department for International Development, the International Fund for Agriculture Development, and USAID to overcome communities' constraints to market access, increase sustainable agricultural development and enhance food security, and identify and nurture technology-driven development opportunities.

MARKETS II collaborated with PIND in the cassava and aquaculture value chains. Additionally, MARKETS II's work in the cocoa and rice value chains in the Niger Delta indirectly supported PIND's overall development goals. The project provided technical support to PIND and participated in its strategy and policy sessions. With MARKETS II's support, PIND expanded to three additional states in the Niger Delta, adding Edo, Ondo, and Cross River to its roster. MARKETS II also collaborated with PIND and other partners in organizing the Niger Delta Development Forum annually since 2012, and the National Cassava Summit in 2016.

“Our partnership with MARKETS II worked out really well — we pursued our goals with passion and great commitment on both sides. This is intensive work, but when it takes off — and it has — it's amazing. We should encourage more of this synergy and collaboration.”

— DARA AKALA,  
EXECUTIVE DIRECTOR, PIND  
FOUNDATION

MARKETS II employed its model methodology, providing technical support and production expertise via service providers and EAs. For example, in aquaculture, MARKETS II provided technical expertise to establish and scale-up demonstration ponds for PIND's partners in Delta and Ondo States. The project also delivered the NAEC training program to PIND's aquaculture partners. For cassava, the project facilitated out-grower schemes and provided business development training for village/community processing groups for products like garri, fufu, and cassava wet-cake. It also provided technical and business training to 40 youth in Ondo State under Chevron Nigeria's 100-hectare cassava enterprise project. At the same time, PIND's market development officers provided market analyses and identified constraints to market efficiencies along the value chain.

The project also brought its access-to-finance strategy and activities to the Niger Delta, working with the financial services sector to expand credit to farmers, farmer associations, and small businesses. Credit programs in the Niger Delta historically have suffered from low repayment rates. To address this issue, MARKETS II worked with LAPO to pilot a credit program in the aquaculture sector. The project brought LAPO and farmers and processors together to understand each other's businesses and identify how they could work together. As part of the pilot, MARKETS II

performed a basic financial and organizational analysis of groups to see if they would be creditworthy, and oriented those groups on how to secure credit and pay back their loans. An initial set of five associations selected by LAPO signed memoranda of understanding.

As requested by PIND, the project provided technical training and support to PIND partners and to additional value chains not supported under MARKETS II. For example, the project modified its NAEC training program for the U.K. Department for International Development's Market Development Program for the poultry sector, using MARKETS II master trainers to lead curriculum development. MARKETS II also provided training and support to PIND's stakeholders, replicating its access-to-finance program for the oil palm sector with Eagle Flight Microfinance. Additionally, MARKETS II conducted an assessment of the Cross Rivers chapter of the Oil Palm Growers Association of Nigeria, resulting in the selection of 20 farmer associations for credit support. Lastly, MARKETS II worked with PIND to help the Cross River commissioner of agriculture and staff develop the Cross River State Development Goals and Key Performance Indicators Agriculture Plan.

Another aspect of MARKETS II's collaboration was its development of a pool of private and public sector experts (e.g., ADP and cooperative department officers) and expert organizations capable of offering capacity assessments and development services to farmer groups, civil-society organizations, and community-based producer associations. MARKETS II trained 13 consultants and service providers to use organizational capacity assessment tools. A field practicum enabled participants to apply assessment tools by conducting capacity assessments for selected groups and associations in Delta State. Some trainees are now providing support to smallholder farmer associations and civil-society organizations. Finally, through its grants program, MARKETS II provided 13 grants to organizations that directly or indirectly supported PIND's objectives, including eight grants to fingerling hatcheries to increase the supply of high-quality fish stock, three grants to provide motorized agro-chemical sprayers to cocoa producer groups, one grant to promote fish smoking, and one grant to provide a thresher to facilitate post-harvest rice handling.

Based on its experience with MARKETS II, PIND plans to expand the scope of its activities in the Niger Delta and to continue key elements of its work begun in collaboration with the project. For example, in recognition of the importance of the cocoa value chain, PIND plans to add cocoa to its program of support to the region. In addition, the foundation plans to continue to promote the use of insect protein for fish food and to provide additional assistance to fingerling hatcheries.



PROMOTE

## Environmental Stewardship

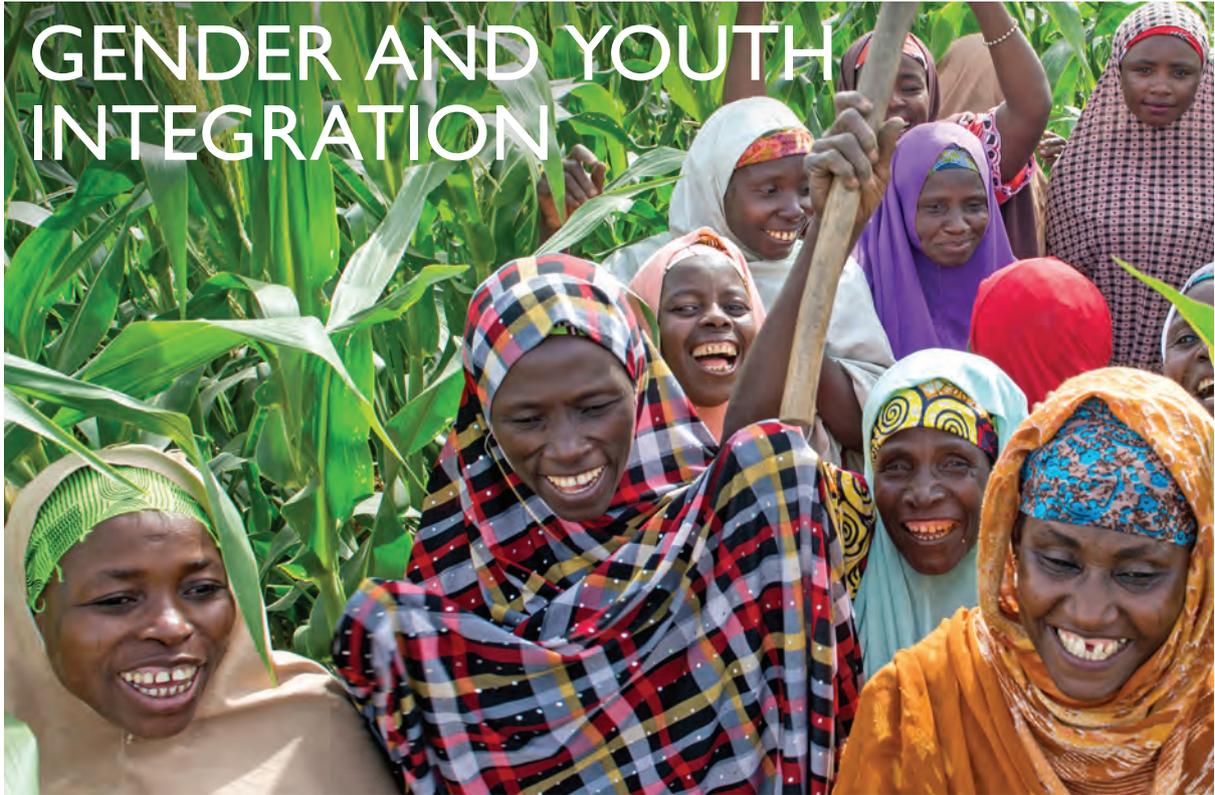
**Done incorrectly, agriculture and agri-businesses can have negative effects on the environment, causing soil erosion, water pollution, or cross-contamination from pesticides and herbicides.**

Because Nigeria already faces threats due to climate change, including increased desertification, flooding, drought, and erratic weather patterns, MARKETS II integrated environmental stewardship and risk mitigation into all of its activities. This included promoting environmentally friendly practices through its POP and working with agro-processors to develop or implement pollution-reduction practices. For example, Kebbi state has a high risk of flooding during the rainy season and farmers risk losing entire crops. MARKETS II promoted improved dry-season rice cultivation to mitigate this negative impact on farmers' income and food security.

Soil and water management were key components of each value chain's POP. The project promoted no- or low-till land preparation to save precious topsoil from wind erosion. To increase soil fertility, the project encouraged crop rotation with legumes, harvesting methods allowing rice and soybean roots to remain and rot in the soil, and use of manure or organic compost. In addition, the project promoted the use of USG fertilizer in appropriate value chains, reducing the environmental impact of excessive and inefficient fertilizer use. To encourage optimal use of water in the North, MARKETS II promoted drought-resistant varieties, irrigation scheduling to reduce water use during dry-season cultivation, and drip irrigation for household gardening. For the aquaculture value chain, which is water-intensive, MARKETS II promoted water-saving measures, such as water-treatment methods reutilizing wastewater, water-quality testing kits, and proper disposal of wastewater. Finally, the project delivered training on safe pesticide use and disposal and promoted exclusive use of pesticides approved in the Pesticide Evaluation Report and Safer Use Action Plan.

With its agro-processing partners, MARKETS II also provided environmental reviews and recommendations for instituting environmentally friendly practices, especially in waste management. For example, MARKETS II advised rice millers on how to prevent environmental damage from effluent disposal via training and information dissemination on proper disposal of solid and liquid waste. Throughout implementation, MARKETS II reported on its environmental monitoring and mitigation activities quarterly and ensured adherence to environment review forms for all technical activities, including subcontractor and grantee activities.

# GENDER AND YOUTH INTEGRATION



Female participants in project-assisted programs designed to increase access to productive economic resources (assets, credit, income or employment)



Women report increased self-efficacy after MARKETS II-supported training and programming



Target population reports increased agreement with the concept that men and women should have equal access to social, economic, and political opportunities



FY2012    FY2015    FY2017

## VALUE OF AGRICULTURAL LOANS



## FARMERS AND OTHERS APPLYING NEW TECHNOLOGIES AND MANAGEMENT PRACTICES



## INDIVIDUALS RECEIVING SHORT-TERM AGRICULTURAL SECTOR PRODUCTIVITY OR FOOD SECURITY TRAINING



## MEMBERS OF PRODUCER AND COMMUNITY-BASED ORGANIZATIONS RECEIVING USG ASSISTANCE



## Section 4

# Integrating Vulnerable Populations (Women, Youth, and IDPs)

Vulnerable populations, such as women, youth, and IDPs, face particular challenges to making agriculture a productive and profitable enterprise. Although women constitute a significant percent of agricultural labor, they have less access to land; less access to capital to buy or lease land; and often, lower standing in farmer groups. Women also have less access to agricultural inputs, such as improved seed and fertilizer. For youth, the lure of urban areas and the perception of better opportunities there contribute to Nigeria's rapid rate of urbanization. This presents long-term threats to the country's food security, as it depletes rural areas of potential farmers and agriculture sector labor. It also presents long-term threats to national security due to large numbers of potential unemployed youth in urban areas. Keeping youth in rural areas requires altering young people's perception that farming is an activity of last resort, or one that requires grinding manual labor for little to no gain. To help IDPs cope with losing their homes and income, MARKETS II also adapted MEF training materials to provide simple business, nutrition, and hygiene skills that they could use in their displacement camp environment.

## WOMEN AND YOUTH

In line with global experience, MARKETS II found that women's access to increased income results in three major changes in the family: investments in furthering income-generating activities; investments in household needs (such as food, education, and health care); and savings for unexpected events. MARKETS II worked throughout the value chain to address the particular barriers mentioned above faced by women and youth<sup>5</sup>, both male and female. The project established systemic approaches to facilitate and ensure women and youths' integration into commercial agriculture. For example, all service providers who oversaw MARKETS II's networking and training programs were required to target 50-percent participation by women and 30-percent participation by youth (defined as age 29 or under) as project-networked farmers. To facilitate achievement of this target, and in recognition of the difficulties that women and youth face in accessing land, MARKETS II reduced the one-hectare threshold for participation in the program to one-half hectare for women and youth. Incorporating more women and youth into networked farmer groups also mitigated their constraints to access inputs; farmer group membership often offered bulk purchases for inputs at discounted prices and group lending schemes. Women and youth's incorporation into farmer groups exposed them to the POPs, recommended input technologies, and linkages with suppliers. The project also identified non-farming opportunities along the value chain

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<sup>5</sup> MARKETS II combined women and youth into all project activities. That is, there were no women-only or youth-only activities.

that were more accessible to women and youth, especially those without access to land or significant capital to invest. To address constraints to accessing capital, MARKETS II partnered with women-focused microfinance organizations and lending institutions with credit programs for women in farming services and processing. MFBs' loan products were often more suited to small-scale processing and trade, and these types of activities were often more accessible to women than profitable farming. This helped female micro- and small-scale traders and processors secure loans in the rural economy. The project also established a household economic strengthening unit tasked with promoting gender integration across project activities and ensuring that women and youth benefitted from project interventions.

To promote female role models in the agriculture sector, MARKETS II engaged four female technical field staff and 10 female training consultants (out of 20 used regularly for NAEC, MEF, and leadership training), and encouraged ADPs and service providers to identify and integrate female EAs, business leaders, and lead farmers into the project's activities as a way to increase women's, including young women's, participation in the program. The project engaged a total of 924 EAs; out of these, 263 were women (28 percent) and 661 were men, with an additional 37 female supervisors (26 percent) out of 143 supervisors. MARKETS II project staff and consultants were selected based on qualifications, without an intentional gender balance focus, which resulted in a male majority of technical staff. However, future projects should consider actively hiring junior female staff to mentor, or find other ways to support female students and recent graduates, as an intentional approach to building professional capacity. Additionally, it was challenging for MARKETS II to engage more female EAs because ADPs were not hiring EAs until the final project year, when agriculture became a higher priority for the country. MARKETS II would have had to pay EAs' full salaries and benefits, rather than just the stipend used by the project, if it wanted ADPs to hire more women. Instead, the project utilized all existing qualified female EAs and found alternative female role models.

For example, using demonstration plots managed by female lead farmers promoted female leadership in communities and showed that female farmers were capable of applying new practices and achieving yields equal to (or better than) those achieved by men. The project also proactively identified or created women-only farmer groups for networking into its activities, and advocated for community leaders to lease land to women's farmer groups. In addition, MARKETS II collaborated with state ADPs' Women in Agriculture Units to provide training on agricultural production extension, MEF, and nutrition enhancement training, including cooking demonstrations and hygiene, for MARKETS II-networked farmer households and micro and small-scale processors. This curriculum also strengthened trainers' soft skills to address traditional practices and beliefs by giving women an opportunity to remain in line with their culture and traditions while making conscious choices of adapting new behaviors. Because men do the majority of food shopping in rural Nigeria, the project integrated nutrition modules into all of MARKETS II's training programs to ensure men and women received instruction on how to achieve a more nutritious diet. Project training also integrated water, sanitation, and hygiene best practices, particularly farm-centered behaviors, such as washing hands after using agro-chemicals.

To further increase household income and food security, MARKETS II promoted homestead gardening. Using 300 to 500 square meter (0.03 to 0.05 hectare) plots — or even sacks or small containers — women could generate additional income for their families and provide nutritious vegetables to complement their families' diets. MARKETS II developed a POP for training women's groups on homestead gardening, which incorporated household nutrition and maternal and child nutrition to encourage trainees to consume more of their produce instead of selling it all to improve health outcomes. To help women turn their homestead gardens into small businesses, participants also received the project's MEF training, which reinforced concepts from the POP training. The MEF also included technical food preparation and packaging demonstrations using products from the homestead garden and the farm, such as soy, maize, cassava, and sorghum. A total of 1,653 women (including 311 youth) in 75 groups received the homestead gardening training. MARKETS II also provided a training-of-trainers on its homestead gardening POP for Action Against Hunger, which stepped down the training to IDPs and farmers in Yobe state, and for USAID/Feed the Future's Nigeria Livelihoods project, which used the curriculum to train field agents and female farmers in Kebbi and Sokoto states.

To expand homestead gardening in the dry season, MARKETS II also piloted the use of low-cost drip irrigation in Kaduna, Kano, Kebbi, and Jigawa states. Drip-irrigation systems saved farmers time and money due to reduced water use. The project trained selected women's farmer groups on how to use drip irrigation on dry-season vegetables (e.g., onion, tomatoes, pepper, okra, spinach, and other leafy vegetables) to complement wet-season production and improve family nutrition and income. The project donated drip-irrigation systems to the groups as part of the pilot program, and some of its beneficiary groups are already in the process of procuring additional systems.

For aquaculture, MARKETS II piloted micro-scale homestead fish-farming practices in 1,000-liter plastic tanks in beneficiaries' backyards in Kwara, Lagos, and Oyo states. This type of homestead fish farming will facilitate women and youth involvement in fish production, increasing food security and income generation. In addition, wastewater from the rearing tank can be drained to irrigate small vegetable gardens for food and/or income.

To create income-generating opportunities for women and youth, MARKETS II identified entry points in non-farming segments of its targeted value chains. The project promoted job creation through a range of farm services, such as seed sorting, grain cleaning, pollination, bulking, packaging, pesticide spraying services, micro- and small-scale processing, and marketing. Micro-processing particularly well-suited for female entrepreneurs working out of their homes. The project promoted micro- and small-scale processing business development among women's groups, for example, by processing soy into tofu or cassava into garri or fufu. Soy processing activities were smaller-scale initiatives incorporated into the MEF and nutrition training to increase food security, with the added potential of providing employment opportunities to offer nutritious soy-based foods to families and communities. The project also trained women and youth on cassava cutting systems for rapid multiplication of cassava stems, facilitating an increase in production and quality of cassava roots for out-grower schemes. Additionally, MARKETS II trained women on how to prepare organic compost fertilizer that could be sold to other farmers.

Because the required materials for making compost are often regarded as waste, this was an inexpensive means of developing a small business.

MARKETS II also piloted beekeeping for women and youth to produce honey and provide crop pollination services for cocoa and soybean. At PIND's request, the project trained PIND's oil palm groups on beekeeping activities. Beekeeping is traditionally a male-dominated field in Nigeria. Hives are kept in trees and tended in late evening, making it an impractical occupation for women. To make honey production and pollination more efficient, MARKETS II promoted vertical hives that could be placed on the ground and tended in the early-morning hours. This made beekeeping more attractive to women and youth because of the limited land and investment requirements and the reduced security concerns associated with late-night hive-tending. Women engaged in beekeeping thus decided where to keep the hives, the size of the hives, and schedules for hive maintenance. Nearly 1,200 people — 90 percent of which were women — received training on beekeeping and honey production in eight states, and 28 cooperatives for beekeepers were formed and registered. Nearly 300 people (95 percent of whom were women) received training on becoming pollinators. MARKETS II engaged a service provider, Bargong Farms Limited, with expertise in beekeeping and pollination. Bargong's business model included an upfront one-off investment in providing trained beekeepers with hives, honeybee colonies, protective clothing, and portable hive carrier cases to facilitate transport, with the long-term vision of building their bee product supply chain and purchasing directly from their trained beekeepers. Beekeeper training included practical apiary management, group dynamics, and group strengthening for honey production. A total of 2,850 plots were pollinated through this activity, in addition to sales of honey and byproducts like beeswax. Using this model, the service provider has developed excellent relationships with beekeepers. It is now recognized by the government of Nigeria as a valuable actor in expanding the potential for bee products in Nigeria, and has been invited to present at international conferences.

MARKETS II also promoted a pesticide spraying business opportunity to address the environmental and health issues caused by farmers incorrectly using non-approved poisonous chemicals and inappropriately disposing of and using containers (e.g., storing water for household use). The project trained youth — particularly male youth, because the project was concerned about chemical exposure for women of childbearing age — on proper and safe pesticide application and disposal, recommended project-approved chemicals, and protective equipment. This technical training was complimented with NAEC training to develop farmers' business skills and help them augment their incomes by selling spraying services to farmers in their area. In the cocoa value chain, this technical training was augmented with in-kind grants of agro-chemical sprayers to farmers associations, whose young members provided fee-based spraying services to both members and non-members. Through this arrangement, youth earned an income, and the association could augment its financial resources.

## **IDPS AND OTHER VULNERABLE POPULATIONS**

Some of the most vulnerable populations supported via MARKETS II's interventions were IDPs. The conflict with Boko Haram set off waves of civilian migration from northeastern Nigeria, disrupting livelihood activities, markets, and trade flows.

By early 2015, the National Commission for Refugees, Migrants, and Internally Displaced Persons estimated that approximately 725,000 IDPs were living in camps across the country. Because MARKETS II was designed with a rapid-response mechanism allowing USAID to respond to unanticipated events affecting economic development or agricultural goals, in 2015, the project mobilized to support IDPs. MARKETS II conducted rapid assessments of IDP camps in Kano, Kaduna, Taraba, Nassarawa, and Benue states, as well as the Federal Capital Territory, and contacted other agencies working with IDPs to determine areas of support. Critical needs identified during the assessments included low or no income for households, no access to primary health care, poor nutrition, and unhygienic conditions.

These assessments resulted in modifying and integrating the existing MEF, nutrition and hygiene, and homestead gardening curricula. The goal of this adapted training was to help IDPs develop business and life skills that could be used anywhere to diversify their livelihoods, or to re-establish livelihoods disrupted or destroyed by displacement. The training program reflected the challenging circumstances that IDPs faced, balancing theory and practice to increase their awareness of business skills, nutrition, hygiene, and sanitation. For example, the training demonstrated how to make low-cost, balanced meals using the limited food sources available in camps. The training also stressed the importance of saving, highlighting that starting a business did not require a lot of money. With this in mind, some of the MARKETS II trainees walked to the training location to save their transportation stipends and used the stipends as seed capital for their businesses. In this way, they were able to launch micro-businesses with less than \$5.

In implementing IDP activities, MARKETS II worked closely with other organizations responding to the crisis, including the Hisbah Board in Kano, Action Against Hunger, the Taraba Protection Sector working group, and other support agencies, to help secure initial capital for IDP trainees' businesses and provide training-of-trainers to groups wishing to adopt the project's integrated MEF/nutrition curriculum. The Hisbah Board of Kano, which originally provided only financing to IDPs, required IDPs to participate in MARKETS II's IDP-adapted MEF training program, using local master trainers developed by the project, prior to providing financial assistance. At the Hisbah Board's request, MARKETS II provided a training-of-trainers workshop for its staff so that it could continue to provide the MEF training after MARKETS II ended. Through these efforts, MARKETS II reached 20,181 IDPs, many of whom were women who lost their husbands to the fighting.

At USAID's and PEPFAR's request, MARKETS II utilized its team of local master trainers to provide the IDP-adapted MEF training-of-trainers program to staff and project partners supporting orphans and vulnerable children. Such partners included the Food and Nutrition Technical Assistance III and Systems Transformed for Empowered Action and Enabling Responses for Vulnerable Children and Families in Akwa Ibom, Bauchi, Bayelsa, Cross River, Edo, and Rivers states. Today, MARKETS II's training continues to be replicated by other organizations across Nigeria.

# Displaced But Not Defeated

**IDPs across Nigeria are learning how to establish and manage small businesses and promote improved nutrition and sanitation as a result of USAID-funded programs.**



PHOTO: MARKETS II

**Ladi Mathias with her thriving akara business in Kuchingoro camp.**

Through MARKET II's rapid-response mechanism, the project supported one of Nigeria's most vulnerable populations: IDPs. Since 2015, MARKETS II has provided its MEF training program to IDPs, including Ladi Mathias, who was forced to flee her village with her seven children after it was attacked by Boko Haram. She made it to the Kuchingoro IDP camp in Abuja, and in 2015, was selected to attend a MARKETS II-led MEF training. At the training, she learned how to manage a small business, provide affordable and balanced meals to her family, and practice proper hygiene and sanitation to avoid illness.

Before becoming an IDP, Ladi sold *akara* (soybean cake) and groundnuts in Borno state. The MARKETS II-led MEF training inspired her to revive her business in the camp. One of the trainers saw her determination and gave her 2,000 naira as startup capital for her akara business. Ladi's profits are now 13,000 to 15,000 naira, from which she saves 10,000 naira, donates 1,000 naira to church, and uses the rest for family maintenance.

"Before the training I didn't know anything about profit or capital," said Ladi. "I would just sell and use all the money, sometimes forgetting to keep some for restocking." The training enabled her to keep records and save, which motivated her to open a bank account. Her family now eats three times a day. Following what she learned, she no longer gives them only carbohydrates, but also local vegetables and protein.

Ladi would like to see more women empowered to "pick up the pieces of their lives" like she is doing. She helps those in need because she has benefitted from other people's help. For instance, she recently paid for a 500 naira injection for a sick woman.

"I do not have a perfect life, but I certainly have a better one. It could have been worse, but this project made it smooth. I will take one step at a time and I know eventually I will get where I want to be," said Ladi.



RESPOND



## Program Modifier/Rapid-Response Mechanism

**MARKETS II was designed with a rapid-response mechanism allowing USAID to respond to unanticipated events affecting economic development or agricultural goals.**

In addition to IDP support, MARKETS II responded to three public health crises with the potential to cause great loss of life in Nigeria's rural areas. The dissemination approach for each crisis included integrating information and public health materials into the project's POP training activities to reach the largest number of people in rural areas, training federal and state health and agricultural staff on those materials, and providing printed materials for government dissemination efforts.

The outbreak of the Ebola virus in 2014 caused more than 11,000 deaths in West Africa. Although Nigeria was spared the worst of the epidemic's effects, the country did record 20 cases of the disease. MARKETS II integrated information on Ebola into all of its training programs, teaching farmers about how the disease is potentially contracted, symptoms, how it spreads, and preventive measures. Farmers were also advised to seek health care services as soon as they suspected symptoms of the virus. The project distributed flyers to farmers as a "take-home guide" to spread the message to other people in their communities.

The outbreak of highly pathogenic avian influenza, which flared up in 2014, was far more widespread, affecting 14 states and the Federal Capital Territory. Although MARKETS did not target the poultry value chain, effective management and control of avian influenza was critical for the livelihoods and food security of poultry farmers and farming communities. In 2015, the project conducted training-of-trainers workshops in Kano and Ibadan for 141 practitioners from federal and state governments, quarantine services, and Ministries of Information and Health. The workshops focused on disease surveillance, biosecurity principles for farms and live bird markets, depopulation, use of personal protective equipment, and GPS in disease tracking and reporting.

Finally, MARKETS II supported the government's response to Lassa fever, a rodent-borne disease that causes hemorrhagic fevers that can be fatal. The project disseminated awareness materials and trained 74 state health communication experts on the disease (in collaboration with federal government staff).

# SUSTAINABILITY



169

Public-private partnerships facilitated



\$27,220,325

Private sector investment



\$80,630,011

Public sector investment

## Section 5

# Sustainability of MARKETS II's Approach

Since the beginning of the project, MARKETS II has recognized the need to involve and strengthen the capacity of its partners and stakeholders at multiple levels — farmers and farmer groups, off-taker processors and input suppliers, financial institutions, and public and private sector institutions involved in agricultural service delivery. Its ultimate objective is to develop a sustainable system in which smallholder farmers can access high-quality inputs and services and in which processors receive the quality and quantity of raw materials they need.

Sustainability in the MARKETS II context depends on a viable business case where buyers and value chain actors see the merit of long-term mutually beneficial relationships. It is not necessary to carry on specific project activities beyond the project's end date; however, it is necessary for stakeholders to continue profitable, beneficial businesses. State government decision-makers need to see the business case in prioritizing quality extension services and creating a supportive enabling environment, resulting in positive benefits and returns to the state. Processors need to continue to work with smallholder farmers, not for corporate social responsibility, but because smallholders are necessary to keep mills running profitably and at full capacity. Correct support and training will enable smallholders to produce higher-quality and reliable quantities of raw materials for mills. Smallholders will need to continually see that farming is a business, agriculture is a science, inputs are investments, and that strong and collaborative farmer groups benefit all members.

For the past 12 years — through MARKETS, Bridge to MARKETS 2, and MARKETS II — USAID has demonstrated this business case. For MARKETS II's partners — from the bottom to the top of the value chain — the change has been remarkable. Lead farmers are respected in their community, imparting knowledge to networked and non-networked farmers. MARKETS II-networked farmers can recite POP best practices, and know that time and money invested in high-quality inputs and crop management will pay dividends. They will not return to the old methods of farming.

### SPREADING THE MARKETS II WORD

MARKETS II's impact has spread in Nigeria through the copycat phenomenon. Monitoring and evaluation surveys have shown that farmers participating in MARKETS II have passed on improved agronomic information to non-networked farmers. For example, Luan Musa, a farmer from Kebbe local government area in Sokoto, traveled to Zamfara State for several seasons to spread proper farming techniques to new communities. Luan had a friend from Zamfara who visited him in Kebbe, and witnessed first-hand the positive impact MARKETS II techniques had on the quality and quantity of rice yields. Impressed by these gains, he contracted Luan for 25,000 naira to travel to Zamfara with him to train farmers in POP for rice package practices. MARKETS II provided Luan with take-away manuals, and with these he trained 25 farmers, who continue to spread the techniques throughout their communities.

Similarly, Kebbi State EA Muntar was selected by his ADP to travel to Imo State and train a group of EAs on the POP for rice. Imo State did not participate in MARKETS II as a targeted project area, but the state ADP saw the great successes of MARKETS II farmers and EAs elsewhere, and expressed interest in receiving the same training.

Input suppliers are expanding their presence into remote areas. A MFB partner now has the largest agriculture sector lending portfolio in Nigeria. Agriculture consulting, organizational development, and training firms have been strengthened. And the project's processor partners are making capital investments and increasing production capacity because they have confidence they will be able to source the raw materials they need to operate profitably. None of this would be happening if value chain actors had not seen the proof in their pocketbooks that the approaches promoted by MARKETS II work.

In addition to those directly affected by the three MARKETS projects, a copycat phenomenon has taken hold, with MARKETS II approaches being shared far beyond the project's original reach. MARKETS II farmers around the country report that their success has motivated their neighbors to apply the best practices taught through the POP to their own fields. EAs trained under MARKETS II are training their colleagues on the POP — both within their office and around the country (see text box, previous page). Other projects and development agencies are engaging MARKETS II-experienced service providers.

For these positive developments to happen, the project recognized the need for local private sector institutions to build their capacity and experience in providing ongoing technical support services in the agricultural sector. The project also recognized the need to partner with and involve state ADPs. As the enduring government institution and system for extension services delivery, this was important in sustaining and expanding the project's overall gains. MARKETS II engaged private sector institutions through a competitive procurement process to carry out field-level interventions with networked farmer groups, defined by an agreed scope of work and subcontract developed by MARKETS II after consultations with partners, including end buyers (processors). The project's relevant technical staff supervised service providers' activities to ensure appropriate deployment of project-promoted POP and technologies, and that farmers and partners achieved the required results and benefits. With an eye to sustainability and extended impact, the service providers' technical teams were required to work with ADPs in the assisted states. The ADPs provided EAs, who then worked with service providers as the primary "hands-on" interface in the field, providing extension services to farmers.

MARKETS II's sustainability strategy included the expectation that project subcontractors will continue to offer similar services beyond the life of the project. Many smallholder producers are not yet willing, or in a position, to pay the cost of public or private extension services; however, they are not the only potential clients. MARKETS II subcontractors have already begun providing similar extension services to additional clients, and the project has actively recommended and linked project subcontracts with other donor projects (e.g., International Fund for Agricultural Development, World Bank, USAID, and the U.K. Department for International Development) and value chain stakeholder off-takers. For instance, the International Fund for Agricultural Development requested recommendations for MARKETS II subcontractors that could support their projects, in addition to guidance on how MARKET II has managed its subcontractor systems. The project's private sector partners, such as off-takers, have come to value the role that the local service provider played in MARKETS II's technical efforts. Service providers contributed to off-taker planning, review, technical, and buy-back meetings. Ideally, MARKETS II's

value chain off-taker partners will engage service providers to continue some or all of their extension activities. As a starting point, the project has seen partner off-takers adopt aspects of MARKETS II's approach and methodology to ensure the continued momentum of their operations. Also, by working with MARKETS II's farmers and methodology over the seasons, service providers have recognized business opportunities to expand their services in farming and agriculture, such as equipment leasing and sales and mechanization services.

A summary of MARKETS II's comprehensive training and assistance programs supporting sustainability at various levels is presented below:

## **SERVICE PROVIDERS**

*“Getting to Subcontracts” workshops.* MARKETS II worked with local implementing partners with the requisite capacity to deliver services as specified in periodically advertised RFPs. Project service providers were selected via a rigorous competitive process. To improve the quality of proposals and increase the number of potential service providers, MARKETS II organized “Getting to Subcontracts” workshops at the beginning of the RFP process. The workshops were an opportunity for MARKETS II staff to introduce the project, explain the requirements that potential service providers had to meet in responding to RFPs, and answer questions.

*Annual roundtables and one-on-one sessions with service providers.* To improve program implementation effectiveness, MARKETS II held roundtables earlier in the project with the seasons' subcontractors. When subcontractors became more experienced with MARKETS II, the project shifted to one-on-one sessions. The roundtables and one-on-one sessions' objectives were to review program implementation, share experiences and lessons learned, and conduct a formal orientation for subcontractors for the coming year. The service providers held similar orientation programs with their implementation teams at the field level.

*Organizational capacity assessments and institutional development for local service providers.* Local technical service providers received support for capacity development through training and workshops, structured organizational capacity assessments, advisory services on content development, improved training materials, and delivery techniques. MARKETS II's goal was to go beyond training and provide mentorship to help them enhance their services and leave behind a more robust, commercially oriented service provider market that can service needs within the agricultural sector. These efforts improved the ability of MARKETS II service providers to provide direct technical assistance and training to Nigerian agricultural value chain actors and contract with donors and other organizations and businesses supporting the sector. To meet MARKETS II and USAID requirements, the project conducted three rounds of a guided organizational capacity assessment of the service providers, including organizational self-evaluations involving participatory assessments and evidence-based scoring along seven capacity domains. The project then organized workshops and training to address identified gaps. Additionally, MARKETS II's technical team facilitated annual two-day capacity-building workshops to boost service providers' management and technical skills.

*Periodic performance evaluation of MARKETS II subcontractors.* In addition to reviewing and approving service providers' deliverables — including their work plans to launch each season — MARKETS II conducted periodic formal performance evaluations. This ensured that service providers who performed well continued to be invited to participate in the competitive bidding process for subcontracts. The evaluations provided an objective and informed basis for scoring service providers' performance records during proposal evaluation committees. Performance evaluations and ad hoc feedback to subcontractors assisted, not only in terms of transparency or quality assurance, but in assessing the general commitment of service providers to their assigned roles. The project also provided feedback during one-on-one sessions and joint roundtables.

*Increased pool of service providers and professionals with organizational capacity assessment and development skills, particularly in the Niger Delta.* A key aspect of MARKETS II's collaboration with PIND was developing a pool of local experts capable of offering capacity assessment and development services to farmer groups and civil-society organizations. The project trained an initial 13 consultants/service providers in using organizational capacity assessment tools; each trainee bore the basic cost of participation, which is a testament to their commitment. The training covered basic concepts of organizational development and the organizational development cycle, various organizational capacity assessment tools, and how those tools could be adapted. A field practicum enabled participants to apply these assessment tools by conducting capacity assessments for selected groups and associations in Delta State. Some trainees from this program are now providing support to small farmer associations and civil-society organizations.



Muntala Moh'd from the Masama Rice Farmers Association feeds millet into the multi-crop thresher provided as a project grant. Through the grant, the association's business management has improved, allowing it to provide mechanized threshing services to its members and to the wider community in Argungu, Kebbi state.

## PUBLIC EXTENSION AGENTS

Given that ADPs play a central role in the system and are still the more widely available agricultural support service, the project placed considerable focus, effort, and resources into empowering the ADPs and their staff by immersing them in MARKETS II activities and training workshops. This helped ADPs and their staff to more effectively support farmers' and producer organizations' needs.

*Training and capacity building for ADPs and EAs.* Because EAs are heavily involved in the technical training of lead farmers and farmer groups using MARKETS II's POP, EAs actively participated in developing and periodically revising the POP for all commodities under the project. EAs also received instruction on new training delivery approaches using the POP for their field support to farmers, and received training in monitoring and evaluating data.

*EA group dynamics and leadership training.* The project trained EAs on delivering the MARKETS II group dynamics and leadership course, improving their ability to use the curriculum to support producer groups and associations. Project training has often involved other ADP staff supporting farmers not directly involved in MARKETS II's project implementation.

*Improved supervision and communication with the ADP.* To improve the ADP's internal management and information flow — to other ADP EAs not participating in MARKETS II, and upward to the ADP program manager and state commissioner of agriculture — MARKETS II supported the creation of a new ADP position (value chain project manager) for each assisted value chain.

## FARMERS

MARKETS II's farmer training and capacity-building activities aimed to develop a long-term business perspective, including planning and focusing beyond the one-period crop cycle, appreciating commercial partnerships, improving small farm commercial management and recordkeeping, considering demand and supply, and paying for services that increase benefits.

*Lead farmers as community-based junior EAs and role models.* Widespread acceptance of improved farming methods is easier when farmers see their neighbors employing new technologies and reaping the benefits. Lead farmers, members of the community selected by their farmer associations, received direct agronomic training from MARKETS II. They were then instructed to develop a demonstration plot in a well-trafficked area to show the improved growing techniques promoted by the project in comparison with their traditional production methods. They were also tasked with stepping-down the training to other members in their farmer association. Given the visible improvements in their yields and revenues, lead farmers gained a level of prestige and were seen by association members and non-members in their community as sources of farming knowledge and models to be copied. Farmers were motivated by the sense that, "If my neighbor can do it, I can do it as well."

*Targeted capacity building for farmer associations.* In addition to technical assistance in production, post-harvest handling, and marketing, MARKETS II provided targeted

capacity-building support to selected groups and grantees. Peer learning via exchange visits was also promoted. By strengthening the internal capacity of associations to effectively serve members' needs — including by building business linkages, networking, negotiating to broker stronger relationships with buyers, and securing access to financial services — the project developed groups and associations to serve as models for others, such as the Kiru II Fadama Association in Kano state.

*Group management and business training.* The project's NAEC, group dynamics and leadership, and MEF courses became the anchors of farmer groups' business and organizational management training. As needed, the project revised its training packages, adapted or developed new curriculum (e.g., adapting the NAEC for aquaculture), and adapted its delivery approaches to be more participatory.

*NAEC training.* The NAEC curriculum spread the message that agriculture can be profitable if farm and processing operations are approached from a business perspective. Two basic curricula existed: one focused on farmers, and the other targeted processors and input providers. A third curriculum, modified for aquaculture, was implemented extensively in the Niger Delta in collaboration with PIND, in Kano in collaboration with the Kano State government's Fisheries Training Institute, and in northern and middle belt states in collaboration with fish farmers.

To promote the sustainable and expanded use of the NAEC training, the project undertook other initiatives jointly with FADAMA III and the International Fund for Agricultural Development's Community-Based Natural Resource Management Programme. MARKETS II also supported three large local MFBs (LAPO, DEC, and Fortis) to provide this training as internalized embedded services to complement their loan products in the southern and northern states where they operate.

## OTHER SUPPORTING SERVICES AND STAKEHOLDERS

*Training for farm service providers and agribusinesses.* Success over the long term means that value chain actors see the opportunities and benefits of working together. To establish or improve services for the small-scale farmer, MARKETS II identified business opportunities for needed non-farming agricultural services (e.g., nurseries, pesticide spraying services, pollination services, micro- and small-scale processing, and micro-finance credit to farmers). It extended its technical and business training to these entrepreneurs and organizations, facilitated contacts to foster business relations, and followed up with monitoring and additional training as required.

*Group dynamics and leadership training.* As part of MARKETS II's efforts to strengthen the group leadership, effectiveness, and cohesion of small producer and processor groups, the project organized training events using the group dynamics and leadership course for farmer groups and micro- and small-scale processors.

*MEF training.* MEF is a hands-on integrated approach to income generation, household nutrition, and homestead farming. The goal of this curriculum was for emerging and existing entrepreneurs to strengthen their business skills so they could run profitable businesses, increase their household income, and make their communities stronger. The curriculum offered an innovative way to introduce value chain participants with limited literacy skills to a variety of business practices,

cultivate their enterprise management mindsets, and develop their ability to balance finances across business and personal expenses. It underlined the challenges of home-based family agribusinesses and the importance of income allocation, basic planning, recordkeeping, savings, and risk management. The curriculum also incorporated household nutrition and best practices in maternal and child nutrition, and linked them through homestead farming. Through this activity, vulnerable population participants were empowered to make better business decisions, and to lead healthier and more productive lives.

*Partnerships between large-scale off-takers and smallholder farmers.* Producing and selling profitably was the key business concept that MARKETS II promoted. Large-scale processor off-takers had problems sourcing adequate amounts of good-quality raw materials, while small-scale producers could benefit from increased marketing channels and demand. By bringing these parties together in the course of several agricultural seasons, both sides realized that longer-term relationships would be mutually profitable for all.

*Refresher workshop for master trainers.* To make our core group of short-term consultant trainers more versatile and enable them to train across MARKETS II training curricula — NAEC, group dynamics and leadership, MEF, and the POP — the project held a periodic short training refresher for selected MARKETS II master trainers. Refresher training further strengthened participants' facilitation skills and introduced them to new training materials and methodologies developed under MARKETS II. Afterwards, participants were expected to train other trainers with or without the presence of the project. A unique aspect of this capacity-building initiative was including extension officers identified as potential master trainers.

To further expand its reach and promote sustainability, MARKETS II shared its training curricula and provided training-of-trainers to other donor projects, state and federal government departments, and private sector partners throughout implementation. The project's curricula have been adopted, in whole or in part, by ADPs in each MARKETS II-supported state; the Federal Ministry of Agriculture and Rural Development's Department of Cooperatives; financial service providers LAPO, DEC, and Fortis Bank; and donor projects, including USAID's SHARE, Systems Transformed for Empowered Action and Enabling Responses for Vulnerable Children and Families, the World Bank's FADAMA III project, and the International Fund for Agricultural Development's Community-Based Agricultural and Rural Development Programme. NGOs like Hisbah Board, Mercy Corps, Action Against Hunger, and Catholic Relief Services, as well as private sector companies, have also adopted the project's curricula. In addition, the project's facilitative approach to working with smallholders and bringing them together with processors is being replicated by the Nigerian government (e.g., NIRSAL) and private sector firms (e.g., Labana Rice Mill, Olam, UMZA, and Hule and Sons). These organizations' investment of time and resources shows their faith that taking up MARKETS II's approach after project closeout is necessary to further increasing their bottom lines.

## SNAPSHOT

# Labana's Long-Term View for Rice Production Pays Off



PHOTO: MARKETS II

Working with MARKETS II, Labana Rice Mill recognized the importance of engaging farmers and EAs. The mill instituted initiatives to ensure ongoing relationships, such as farmer credits, fair purchase pricing, engaging farmers in planning, and supporting EAs in their field work.

The relationship with MARKETS II has resulted in “multiple benefits in the sense that more farmers will benefit, Labana will benefit, the economy of the people involved will benefit, the rice marketers in the business sector will benefit, the economy of Nigeria will equally benefit because [the rice paddy value chain] allows Nigeria to gradually produce the rice requirement of Nigerians.”

— Alhaji Abdullahi Liman Zuru,  
general manager of  
Labana Rice Mill

In 2010 in Kebbi state, Labana Rice Mill had land, resources, and ideas for processing rice, but no mill. Based on MARKETS' successful experience with UMZA Rice Mill, which started with just a warehouse, the project encouraged Labana to begin an out-grower program to develop relationships with farmers, learn the paddy-flow process, and grow in phases while the mill was under construction. Labana agreed. Since 2012, MARKETS II and Labana Rice Mill have renewed a results-oriented IA annually. Under the IA, the project organized farmers into groups — if groups did not already exist — and provided training to farmers and EAs on the project's rice POP, group dynamics, leadership, and business skills. Labana agreed to assist farmers with timely access to seed and fertilizer, and buy paddy when harvested. State EAs facilitated training and technical support to farmers. To bolster the IA, Labana invested in 21 motorcycles for EAs to access farmers. Since the Labana and MARKETS II partnership, yields and quality have improved significantly compared to Kebbi state's subsistence, low-quality farming in the past. General manager of Labana Rice Mill, Alhaji Abdullahi Liman Zuru, noted a positive “copycat” effect: “This has attracted more people to establish more rice farms. Farmers are getting higher yields, seeing others get higher yields, expanding their farms, and attracting more farmers into rice production as a business because it is more profitable based on MARKETS II training.”

In 2016, Labana agreed to meet, or exceed, market price to ensure its high-quality paddy supply when prices increased from 64,000 naira to 95,000 naira per ton. With MARKETS II's encouragement, it began involving farmers more in planning and price negotiations. Additionally, Labana engaged farmers as out-growers to produce and supply it with paddy, developing a two-way relationship. Alhaji explained, “We are their permanent customers, they are our permanent out-growers.” At MARKET II's closeout, Labana had a complete, integrated rice mill for processing and packaging 320 tons per day, as well as multiple warehouses, a water treatment plant, a boiler, and a weigh bridge. The company also recorded 1,600 staff and 560 laborers. This success translated into wider effects in the value chain and economy. For example, the transportation sector saw increased business due to the number of trucks bringing paddy to the mill and delivering product to distributors in all major Nigerian cities.

## Section 6

# Lessons Learned and Recommendations

Agriculture is critical to the continued diversification of Nigeria's economy and to increasing rural prosperity and food security for all Nigerians. To inform future efforts to achieve these objectives, below are component-specific recommendations and crosscutting lessons learned from the MARKETS II project.

*All links in a value chain are important.* Building Nigeria's agriculture sector requires a systems approach that encompasses the entire value chain. Without a link to a profitable market demand, farmers will not invest in their farms. Without a reliable, affordable source of quality local raw materials, processors will not expand their operations and will not see local farmers as long-term partners. Without links to experienced extension services and market information, farmers and value-chain actors will not be able to take advantage of market opportunities. Without reliable sources of quality inputs, farmers will not be able to efficiently produce the quantities or quality needed to meet market demand, and processors will not source locally.

*Farmers are rational decision-makers.* Farmers consider different degrees of risk, just like anyone else. For example, "copycatting" is a rational behavior if the farmer sees the benefit, just as subsistence farming is rational if there is no other access to food or no market demand. MARKETS II has shown that Nigerian farmers are very receptive to ideas and willing to take calculated risks if they have reason to believe they can achieve a better outcome. Technology has to be appropriate, affordable, deployable, manageable, and make a positive difference for farmers. Through its multi-faceted training program and support system for farmers, MARKETS II allowed farmers to see for themselves that investing in their farms improves their incomes, living conditions, and food security.

*Agriculture is not only farming.* Producing, processing, and selling inputs are not the only ways to make money in any given value chain. Each step, from planting to delivery to end markets and beyond, provides business opportunities for those entrepreneurial enough to identify and take advantage of them. In this way, one person's problem is another's opportunity. MARKETS II found that a growing cadre of farmer service providers helped farmers and the specific supply chain thrive, while building rural enterprises.

*Increasing profit and decreasing effort retains youth in agriculture.* Nigeria's youth reject the drudgery, poverty, and isolation that previous generations of Nigerian farmers endured. There is a perception that people farm when they cannot do anything else, and that farming is too much effort for too little money. This perception needs to be addressed early in the education process, showing the benefits and opportunities within the agricultural sector. Keeping youth in rural areas increasingly demands mechanization, a connection to the outside world, support systems to establish

agribusinesses, and demonstrating that agriculture can be a profitable business — both for farmers and for farm service providers.

*A strong training platform can be used for multiple purposes.* MARKETS II's training platform was designed primarily to help farmers develop new knowledge and skills to improve their yields, income, business opportunities, and food security. The curricula and methodology brought large numbers of farmers together as adult learners, allowing their interaction to facilitate behavior change and build relationships. Future efforts should consider increasing the training days for networked farmers to solidify their understanding of promoted best practices and to provide ample opportunity to develop and strengthen relationships between farmers and value chain actors. Improved agronomic practices and value chain networks are key for sustainability. The methodology also included the step-down component, expanding the project's reach through farmers learning from lead farmers. MARKETS II capitalized on this approach to adapt the platform to disseminate additional information — such as nutrition education and raising awareness of new disease threats — to wider numbers of people, using a business lens to present these issues as an investment to the farmer. The project also capitalized on training venues to create miniature agricultural fairs, inviting input suppliers, mechanization vendors, and processors to demonstrate products and build relationships. Although not originally designed to systematically incorporate the above additions, over time, the MARKETS II training platform became uniform across value chains and adaptable to diverse audiences, and has been adopted and replicated by other organizations.

*Long-term consistency in programming was critical to MARKETS II's momentum and imitation.* With a range of interventions that changed behaviors and increased sales and incomes, MARKETS, Bridge to MARKETS 2, and MARKETS II became a known and trusted partner throughout Nigeria. Considering the recognition of the MARKETS II “brand” and the confidence that the project's endorsement instills (e.g., farmers and processors are more willing to participate when they hear MARKETS II is involved), the project should have provided a type of “seal of approval” certificate to partners and producer groups that were collaborative, trustworthy, and produced high-quality products. For example, the project has heard frequently from buyers that if they know farmers were trained by MARKETS II, then they know they are going to get quality products. Farmers also recently agreed to participate in an outgrower scheme with Flour Mills when they heard it was endorsed by MARKETS II. Although value chain relationships have developed and word-of-mouth references exist, future projects should consider a more formal, tangible recognition that value chain actors can display and promote. From the beginning, the team partnered with end buyer processors, traders, producer organizations, financial institutions, public sector extension providers, private sector extension providers, and NGO extension providers to field-test methods and training, and then adapt them to additional value chains and targeted populations — resulting in experiential proof of their effectiveness and allowing the project to move into new value chains efficiently. MARKETS II's consistent presence as a partner to actors throughout the sector allowed these actors to build trust among themselves, demonstrate the effectiveness of participatory approaches, collaborate in work planning and adjustments, witness their peers' success using recommended technologies, and share those successes with stakeholders for replication. Value-chain actors are now investing independently in project-promoted practices and schemes. Other organizations also recognized the

suitability of the training programs for their target populations and requested that MARKETS II provide training-of-trainers and extension materials to their staff.

*Understanding culture is key to incorporating women.* Creating value chains and a market system inclusive of women requires cognizance of cultural and religious factors. For example, MARKETS II reduced the hectare requirement for women's participation due to their limited access to land. The project also employed female staff, consultants, EAs, and lead farmers to provide positive models for women, respond to women who are more receptive to learning from women, and improve access for women where it is culturally sensitive for male and female interaction. Finally, the project targeted opportunities throughout value chains that were more accessible to women, such as drip irrigation, household gardening, beekeeping and pollination, composting, and small-scale processing and trading. Because women's participation varied between locations, projects need to build in additional time, resources, and staff support to reach women when and where they are available, and conduct a mid-project gender audit to reflect on progress and make any required implementation adjustments.

*Targeting producer organizations is a better approach than targeting individual farmers.* When targeting large numbers of farmers, it is inefficient to work with individuals. MARKETS II's approach to work with farmer associations has shown that the best results are achieved with more cohesive farmer groups. There must be a balance between agronomic training and group strengthening, including how to provide valued services to members. Working with farmer associations also enabled the concept of lead farmers and demonstration plots to thrive; project-promoted technologies' tangible benefits showcased on lead farmers' land and used to train their peers became a cornerstone for uptake and behavior change. Additionally, targeting community leaders as lead farmers and establishing demonstration plots in non-intervention areas increased the adoption rate and reach of the project. Interventions should consider establishing more than one demonstration plot in selected areas to reach more farmers. Where the project trained two to five lead farmers per group, lead farmers could then easily train the other 20 or more members of their association, as well as the wider community. MARKETS II was designed to operate this way, and implementation has proven this is the best approach when targeting tens of thousands of farmers. The farmer association size is also a key factor to ensure manageable numbers for training, and for the group to be able to manage itself. Farmer associations also allow for increased bargaining power in buying inputs; providing member services, such as mechanization; facilitating resource accumulation; and banking (internal and external capital resources). The project supported a large number of farmer associations, creating logistical challenges to provide effective capacity-building training and ongoing support. A better approach is to target groups with capacity-building interventions to serve as models for others, which worked effectively as a number of these groups emerged as grantees, or as grantees emerged as stronger models to replicate. Exchange visits worked well and improved links among farmers to replicate best practices, recognize additional opportunities, and access resources (e.g., buyers, inputs, and equipment).

*Correct use of, and access to, quality inputs are ingredients for success.* Quality inputs are costly, but once farmers see that the benefits outweigh the costs, they are willing to invest. However, proper education on the use of these inputs is critical for

maximizing farmers' investments. Demonstration plots by lead farmers have taught networked farmers how to use improved inputs and convinced them they are worth the purchase price. Ensuring timely access to affordable, high-quality inputs is vital to continuing the gains achieved under MARKETS II. For example, farmers complained they could not access USG during the project's early promotion of the product. In response, MARKETS II introduced Interproducts, in addition to Notore, as USG briquetters to supply farmers directly and develop relationships. Additionally, Interproducts invested in six briquetting machines, with project encouragement, in anticipation of the government's GES program, which planned to reach 350,000 farmers. The government program reached less than 100,000 farmers, so MARKETS II assisted Interproducts to sell their overstock directly to farmers. Despite taking two years to liquidate the stock, Interproducts' initial investment paid off better than planned as they seized the opportunity to know the locations of farmer demand, develop relationships, and bring the product closer to farmers. They now have a larger USG briquette market share than Notore, which started years before in trying to reach farmers. The business model for input suppliers needs to adapt to locate increased stocks of quality inputs closer to farming communities and to consider establishing demonstration plots in farming communities. Focus on scaling up quality seed production and distribution is required, especially for rice. Continued awareness of the importance of environmental compliance for chemical spraying is also needed considering that many farmers do not contract trained sprayers.

*Mechanization improves efficiencies, encourages expanded cultivation, reduces post-harvest loss, and addresses manual labor shortages, but farmers and the market must be ready.* Farmers invest in mechanization when they see demonstrations of productivity benefits. Affordability is an issue, but not every farmer needs to own the equipment; producer organizations can pool funds to buy equipment and provide services to members and other farmers in the community, turning this into a small-scale business and encouraging broader agricultural expansion. But to make mechanization efforts successful, operators need to know how to properly operate equipment and have access to trained technicians and mechanics for repair services and spare parts. The project's experience showed that despite willingness to buy and use equipment, lack of familiarity with the equipment resulted in less-than-optimal use or even damage. Project staff, partners, and equipment suppliers are generally not knowledgeable and offer limited support. Equipment suppliers need to sell standardized equipment, have readily available spare parts, provide customer support, and offer effective operation and maintenance training. Currently there is a shortage of equipment trainers and mechanics, which, on the plus side, offers extensive business opportunities.

*There is significant potential in dry-season irrigated farming.* MARKETS II promoted dry-season farming with two objectives: create business opportunities in the dry season and diversify income to mitigate loss from wet-season flooding or drought. MARKETS II, state extension staff, the project's buyer-linked local NGO and private sector extensions partners, and networked farmers showed that dry-season rice and maize farming works: farmers are adopting dry-season practices, and processors and buyers value the year-round reliable paddy and maize supply. Importantly, dry-season production can be significantly expanded through repair and maintenance of existing canals, and by encouraging processors to invest in paddy dryers to achieve proper moisture content. Dry-season production has contributed to minimizing the

herdsmen-farmer conflict as herds now feed on rice straw and maize husks after harvest. There is also significant opportunity to expand low-cost dry-season vegetable production. MARKETS II found that farmers, particularly women's groups, will readily invest in low-cost drip-irrigation to produce dry-season vegetables, decreasing costs and time for collecting water while increasing income and improving household nutrition.

*Commercial banks are not the only source of credit.* Bridging the gap between commercial banks and smallholder farmers is a tall order, with commercial banks hesitant to loan to them, while many MFBs, although closer to the rural economy and more adaptable to agricultural finance lending requirements, still offer products that do not align with the farming cycle cash flow. However, some MFBs, in partnership with the project's end buyer-linked interventions, are open to expanding their loan portfolio to include loan products that are more suitable to farming as they see a growing and stable market in lending to producer organizations. MFBs generally used loan products with quick turnaround repayments and short loan terms more suitable to the daily income generation of micro- and small-scale enterprises. The project collaborated with MFBs to develop lending packages (and training materials) designed for farm lending, which included loan terms that spanned from land preparation to harvest and post-harvest to cover the agricultural cycle, an initial capital outlay when farmers need cash for land preparation and inputs, and a moratorium to begin repayment during the harvest when farmers earn income again. Although groups may apply for loans and receive adequate training, sometimes the group chairman or high official takes most of the loan and does not pay it back, putting the entire group and the lending institution into a problematic situation. Future projects need to understand that the work is not over once the group receives the loan — continuous effort needs to be put into assuring that repayment is made (at least the first few times that a group receives a loan). In addition to MFBs, processors, input suppliers, credit unions, farmer organizations, and farmer savings (individual or group savings and loan schemes) are often overlooked by value chain actors as potential sources of credit for farmers.

*Use of contract line item numbers (CLINs) for budgeting and reporting purposes.* MARKETS II's project design incorporated five program areas (as described in Section I). These program areas served as the project's intermediate results (I.1 to I.5) in MARKETS II's results framework, contributing to the project intermediate result I: increased smallholder household income. The program areas are also presented as corresponding CLINs in the contract (e.g., CLIN 1: producers' capacity developed and organizations strengthened) to represent their respective budget allocations. As a crosscutting framework to ensure inclusion of each program area across all value chains, the CLINs worked well. However, as a budgeting and reporting framework, CLINs did not work as well because many program areas are integrated, making it challenging to break out and accurately reflect level of effort and associated costs. For example, water and soil management and technology generation and deployment overlap with producers' capacity strengthened — these areas are usually addressed at the same training events. Because the project works in five program areas and seven value chains, while also addressing crosscutting themes, the quarterly reports became repetitive across these sections, making the reports unwieldy. Also, because reporting is conducted against program areas, it is challenging to present a cohesive synthesis of the work in a particular commodity

value chain because the information is broken out across program areas. For example, it is challenging to understand the full picture of MARKETS II's work in rice if readers have to piece the information together across different report sections.

*Agreeing on required monitoring and evaluation data and information at the start of the project.* There is a good deal of project data that can be useful in informing future interventions and policy decisions. However, having good data requires that information collection systems are put in place early on in the project, while data requests late in the project can result in delays and missing or incomplete information. For example, MARKETS II worked with farmer associations (not individual farmers), and used GPS coordinates for their demonstration plots and villages as a proxy for farmer association locations. This suited the project's needs well. However, USAID requested more detailed GPS information late in the last year of the project. MARKETS II did not have that level of detail and required significant time and effort to provide the information in the required format. Another example is information on indirect project impact. Because this was not a contractual requirement, nor a request until late in the project, MARKETS II did not implement a data-capture system to track indirect impact, relying instead on networked farmer recall questions during mid-term and end-term surveys.

# Annex A. Summary of Project Indicators: Life-of-Project Results and Achievements

FEED THE FUTURE (FTF) INDICATOR	PIR/CLIN	Indicator Type	LOP Target	Cumulative Result (April 2012-October 2017)	Life-of-Project Performance Achieved (%)
Custom: Annual expenditures on purchase or upgrading of assets (US\$)	PIR I	Impact	420	358.5	85
Custom: Level of household hunger in the hungry season (%)	PIR I	Impact	40	31.5	127
4.5(2): Number of jobs attributed to FTF implementation	PIR I.1 CLIN I	Outcome	13,470	13,563	101
4.5(4): Gross margin per unit of land, kilogram, or animal of selected product (crops/animals selected vary by country) (US\$)	PIR I.1 CLIN I	Outcome			
Cassava			665	699	105
Cocoa			499	749	150
Fish (Aquaculture)			31,850	32,131	101
Maize (Rain-fed)			625	906	145
Maize (Irrigated)			2,600	2,980	115
Rice (rain fed)			1,350	1,417	105
Rice (irrigated)			1,575	2,018	128
Soybean			420	410	98
Sorghum			410	379	92

<b>FEED THE FUTURE (FTF) INDICATOR</b>	<b>PIR/CLIN</b>	<b>Indicator Type</b>	<b>LOP Target</b>	<b>Cumulative Result (April 2012-October 2017)</b>	<b>Life-of-Project Performance Achieved (%)</b>
<b>4.5.2(2): Number of hectares under improved technologies or management practices as a result of USG assistance</b>	PIR 1.3 CLIN 3	Outcome	1,193,803	1,134,882	95
<b>4.5.2(5): Number of farmers and others who have applied new technologies or management practices as a result of USG assistance</b>	PIR 1.3 CLIN 3	Outcome	1,116,841	1,185,882	106
<b>4.5.2(7): Number of individuals who have received USG supported short-term agricultural sector productivity or food security training</b>	PIR 1.1 CLIN 1	Output	1,166,499	1,154,700	99
<b>4.5.2(39): Number of technologies or management practices in one of the following phases of development as a result of USG assistance</b>	PIR 1.3 CLIN 3	Output	38	48	126
<b>Phase of development</b>			38	48	126
<b>Phase 1: Under research</b>			1	1	100
<b>Phase 2: Under field testing</b>			16	24	150
<b>Phase 3: Made available for transfer</b>			21	23	110

<b>FEED THE FUTURE (FTF) INDICATOR</b>	<b>PIR/CLIN</b>	<b>Indicator Type</b>	<b>LOP Target</b>	<b>Cumulative Result (April 2012-October 2017)</b>	<b>Life-of-Project Performance Achieved (%)</b>
<b>4.5.2(11): Number of food security private enterprises (for profit), producers organizations, water users associations, women's groups, trade and business associations, and community-based organizations receiving USG assistance</b>	PIR I.1 CLIN I	Output	64,415	84,713	132
<b>4.5.2(27) Number of members of producer organizations and community based organizations receiving USG assistance</b>	PIR I.1 CLIN I	Output	1,213,147	1,299,192	107
<b>4.5.2 (28) Number of private enterprises, producers organizations, water users associations, women's groups, trade and business associations and community-based organizations (CBOs) that applied new technologies or management practices as a result of USG assistance</b>	PIR I.3 CLIN 3	Outcome	64,415	84,713	132
<b>4.5.2(12): Number of public-private partnerships formed as a result of FTF assistance</b>	PIR I.1 CLIN I	Output	164	169	103
<b>4.5.2(38): Value of new private sector investment in the agriculture sector or food chain leveraged by FTF implementation (US\$)</b>	PIR I.1 CLIN I	Outcome	23,920,000	27,220,325	114

<b>FEED THE FUTURE (FTF) INDICATOR</b>	<b>PIR/CLIN</b>	<b>Indicator Type</b>	<b>LOP Target</b>	<b>Cumulative Result (April 2012-October 2017)</b>	<b>Life-of-Project Performance Achieved (%)</b>
<b>4.5.2(13): Number households benefiting directly from USG interventions</b>	PIR I.1 CLIN I	Output	1,819,633	1,969,369	108
<b>4.5.2(14): Number of vulnerable households benefiting directly from USG assistance</b>	PIR I.1 CLIN I	Output	60,230	86,055	143
<b>4.5.2(23): Value of incremental sales (collected at farm-level) attributed to FTF implementation (\$)</b>	PIR I.1 CLIN I	Outcome	647,503,730	762,283,633	118
<b>4.5.2(29): Value of Agricultural and Rural Loans (\$)</b>	PIR I.5 CLIN 5	Outcome	218,000,000	269,178,335	123
<b>4.5.2(37): Number of MSMEs, including farmers, receiving business development services from USG assisted sources</b>	PIR I.5 CLIN 5	Output	1,819,633	1,901,830	105
<b>4.5.2(30): Number of MSMEs, including farmers, receiving USG assistance to access loans</b>	PIR I.5 CLIN 5	Output	726,000	822,763	113
<b>Custom: Score, in percent, of combined key areas of organization capacity amongst USG direct and indirect local implementing partners</b>	PIR I.1 CLIN I	Outcome	92.3	88.9	96
<b>Custom: Number of individuals who benefitted from USG assistance</b>	PIR I.1 CLIN I	Output	11,715,760	11,205,287	96

<b>FEED THE FUTURE (FTF) INDICATOR</b>	<b>PIR/CLIN</b>	<b>Indicator Type</b>	<b>LOP Target</b>	<b>Cumulative Result (April 2012-October 2017)</b>	<b>Life-of-Project Performance Achieved (%)</b>
<b>Custom: Number of new jobs created in the value chain (includes jobs lasting less than 4 weeks)</b>	PIR 1.1 CLIN 1	Outcome	200,000	372,329	186
<b>GNDR (2): Proportion of female participants in USG-assisted programs designed to increase access to productive economic resources (assets, credit, income or employment) (%)</b>	PIR 2.1 CLIN 1	Outcome	50	65	130
<b>GNDR (3): Proportion of females who report increased self-efficacy at the conclusion of USG supported training/programming (%)</b>	PIR 2.1 CLIN 1	Outcome	30	33	110
<b>GNDR (4): Proportion of target population reporting increased agreement with the concept that males and females should have equal access to social, economic, and political opportunities (%)</b>	PIR 2.1 CLIN 1	Outcome	30	27.1	90
<b>Custom: Public funds leveraged for agriculture and rural development (US\$)</b>	PIR 1.1 CLIN 1	Outcome	35,600,000	80,630,011	226
<b>Custom: Value of incremental sales (small-scale processors and agro-input level) attributed to FTF implementation (US\$)</b>	PIR 1.1 CLIN 1	Outcome	212,200,000	273,189,878	129

<b>FEED THE FUTURE (FTF) INDICATOR</b>	<b>PIR/CLIN</b>	<b>Indicator Type</b>	<b>LOP Target</b>	<b>Cumulative Result (April 2012-October 2017)</b>	<b>Life-of-Project Performance Achieved (%)</b>
<b>Custom: Number of beneficiaries under the Grants and Subcontracts Fund</b>	PIR 1.6 CLIN 6	Output	164	183	112
<b>Custom: Amount of funds disbursed (US\$)</b>	PIR 1.6 CLIN 6	Outcome	11,286,094	11,538,172	102
<b>Custom: Number of sites reporting proper waste disposal practices</b>	PIR 1.4 CLIN 4	Output	153	97	63
<b>Custom: Number of farmers trained on CPP safe use practices</b>	PIR 1.4 CLIN 4	Output	262,280	247,964	95
<b>Custom: Number of farmers applying CPP safe use practices</b>	PIR 1.4 CLIN 4	Outcome	138,106	179,443	130
<b>Custom: Number of farmers exposed to ICT technology (e-banking, fertilizer voucher program (FVP) through Cellulant, growth enhancement scheme (GES) SMS technology, mobile banking)</b>	PIR 1.3 CLIN 3	Output	300,000	304,108	101
<b>Custom: Increase in productivity (yields) of value chain commodities (Ton/ha)</b>	PIR 1.1 CLIN 1	Outcome			
<b>Cassava</b>			21.84	20.98	96
<b>Cocoa</b>			0.55	0.6	109

<b>FEED THE FUTURE (FTF) INDICATOR</b>	<b>PIR/CLIN</b>	<b>Indicator Type</b>	<b>LOP Target</b>	<b>Cumulative Result (April 2012-October 2017)</b>	<b>Life-of-Project Performance Achieved (%)</b>
Fish (Aquaculture)			20	20.7	104
Maize (Rain fed)			4	4.2	105
Maize (irrigated)			5.22	5.21	100
Rice (rain-fed)			5.45	5.22	96
Rice (irrigated)			6.5	5.85	90
Soybean			2	1.61	81
Sorghum			2.35	2.15	91
<b>FTF 3.1.9-1: Number of people trained in child health and nutrition through USG-supported programs</b>	<b>PIR 1.1 CLIN 1</b>	<b>Output</b>	<b>113,000</b>	<b>144,970</b>	<b>128</b>



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