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PILOT EVALUATION REPORT

Demonstrating a Market Systems Approach in Bidibidi and Palorinya Settlements

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Acronyms

AFAD	Agency for Accelerated Regional Development
CSI	Coping Strategy Index
DCA	DanChurchAid
DFID	Department for International Development
FGD	Focus Group Discussion
IQR	Interquartile Range
MC	Mercy Corps
MSD	Market Systems Development
NGO	Non-Governmental Organisation
NU-TEC	Northern Uganda-Transforming the Economy through Climate Smart Agribusiness
NU-TEC MD	Northern Uganda-Transforming the Economy through Climate Smart Agribusiness Market Development
OPM	Office of the Prime Minister
PHH	Post-Harvest Handling
REHOPE	Refugee and Host Population Empowerment
SACCO	Savings and Credit Cooperative Organisation
UNHCR	United Nations High Commissioner for Refugees
VSLA	Village Savings and Loans Association

Executive Summary

According to the UNHCR Livelihoods Socio-Economic Assessment in the Refugee Hosting Districts published in 2017, the influx of refugees and challenges that they face with regards to livelihoods was, and remains, a major source of concern for the Government of Uganda and humanitarian agencies. Refugee challenges are exacerbated by the fact that most lack human capital: 29 percent have no formal education and 67 percent do not have any trade skills.¹ One-third of refugees do not engage in any specific economic activity. Refugees in Bidibidi Settlement in West Nile are most commonly engaged in small business activities, with 17 percent engaged in such activities. Refugees report receiving about 20 percent each of their total income from business and farming activities (UNHCR, 2017). 27 percent of the population in the West Nile lives below the regional poverty line².

Recognising the lack of sustainability of a traditional in-kind response strategy to address its refugee crisis, Uganda has adopted a progressive approach to refugee hosting, offering significant opportunities to integrate longer-term resilience and development approaches within refugee and host population assistance. Understanding the need to identify a more durable solution to the refugee crisis, a small number of aid actors are exploring a market systems approach to strengthen the ability of displaced groups to engage with and benefit from markets. In this context, in July 2017 the Department for International Development (DFID) contracted Mercy Corps, the Palladium Group and DanChurchAid (DCA) to deliver a 12-month pilot programme, Demonstrating a Market System Approach in Bidibidi and Palorinya Settlements (referred to as “the pilot” in the remainder of this document) in the West Nile region of Northern Uganda with the goal of increasing refugee and host community farmers’ incomes (economic welfare) through growth of the agribusiness sector. Importantly, the pilot was not meant to replace any livelihoods/social safety net projects, nor was it intended to target all farmer households. The goal was to identify and increase access for those households who could and wanted to, produce commercially for market. The primary purpose of the Pilot endline evaluation was to provide tactical recommendations for evidence-based decision making related to programme design, targeting, and implementation of future market-systems development (MSD) programmes.

The pilot blended subsidies with capacity building and engagement of non-aid actors to increase engagement with and access to local markets

The ambitious pilot saw considerable success within the 12-month period, demonstrating early market systems change in the form of behavioural shifts among actors at all stages of the agricultural value chain and demonstrated potential to increasing

farmers’ agricultural incomes in the region in the long-term. While the evaluation found mixed evidence surrounding increases to farmers’ incomes from baseline to endline, at endline over half of farmers engaged in selling produce compared to less than 15 percent of farmers at baseline, indicating more farmers had entered the market though were selling relatively small volumes at endline. At the same time, the limited scope and timeframe of the pilot, highlighted many remaining market challenges and information gaps. If such

¹ Personal skills are trade skills and include masonry, mechanical, tailoring, carpentry, plumbing, etc.

² Defined as individuals in households that spend less than what is necessary to meet their caloric requirements and to afford them a mark-up for non-food needs (UNHS, UBOS 2016/17). Average per capita expenditure in the region was 58,500 UGX (2009/10 prices) (UNHS, UBOS 2016/17). Levels of income are also very low; 53 percent of refugee households earn less than UGX 500,000 (GBP £100) annually compared to 31 percent of host community households (UNHCR Livelihoods Socioeconomic Assessment in the Refugee-Hosting Districts, 2017).

challenges and gaps are addressed through a longer-term strategy, deeper systemic change across the agribusiness sector in the West Nile region is likely.

This report synthesises the successes, challenges and additional considerations brought forth from the pilot and provides key recommendations based on the lessons learned to assist the donor, implementing organisations and the community in understanding and adapting programming to a more market-based and a sustainable alternative to direct aid. The report is organised around several themes which emerged through the evaluation, which speak to both the challenges and opportunities in the region, as well as with using a market-based model to humanitarian assistance, with the key findings highlighted as follows.

The pilot demonstrated mixed evidence regarding increased agricultural income but signs of increased market engagement. Among farmers who reported selling any produce in the previous year, median agricultural income was \$175 PPP among farmers at endline. At baseline, median agricultural income among farmers that had sold produce was \$383. Market sales participation increased from 15 percent among farmers at baseline to over 50 percent among farmers at endline.

The pilot incentivised host community farmers to give land to refugee farmers by offering free tillage services on one acre of their land for every five acres given to refugee farmers. Refugee farmers felt the pilot played a significant role in supporting them to talk to host community landlords to acquire land; 53 percent of refugees accessed land off settlement at endline.

The pilot raised awareness of improved seed varieties and supported increased uptake of improved varieties. Many farmers specifically referenced the Pilot's subsidy scheme, as well as seed fairs hosted by NGOs, as the main ways they found out about and accessed improved seeds. Of the 77 percent of farmers that purchased seeds at baseline, 43 percent purchased an improved variety. At endline 79 percent of farmers purchased seed, of which 90 percent purchased an improved variety.



Pilot farmers cited improved access to inputs, including improved seeds. At endline 41 percent of farmers reported an improvement in their ability to access inputs (seeds, fertiliser, etc.) from the previous growing season, with refugees significantly more likely to report an improvement (49 percent) compared to host community farmers (36 percent).

More than 2.2 million people have been forced to flee South Sudan and take refuge in neighbouring countries including Sudan, Kenya, Ethiopia and Uganda. Bidibidi Settlement, home to over 220,000 refugees, is Uganda's largest refugee settlement and where the Pilot was implemented.

Photo credit: Ezra Millstein

The pilot strengthened relationships between seed companies and agro-dealers, inspired agro-dealers to engage in more marketing activities and illustrated market opportunity to agro-dealers. Under the pilot, Palladium supported agro-dealers by mobilising farmers through the voucher activities and co-delivered and co-funded public awareness activities for improved seeds and inputs in host markets while Mercy Corps and DCA supported the agro-dealers

delivery of awareness activities in refugee settlements. Palladium also connected and helped build relationships between the agro-dealers and larger seed companies such as East Africa Seeds, NASECO and Farmers Service, all based in Kampala.

The pilot's partial subsidies were an effective incentive to increase uptake of improved seeds and land preparation services among farmers, though willingness to pay market price for such products and services was unclear. Only 8 percent of farmers at endline purchased seeds at full market price yet 42 percent of farmers indicated they knew farmers who purchased improved seeds without a discount.

Changed behaviours were positive indications of early market systems changes. Behaviour changes were observed among all market actors. Farmers accessed and used improved seeds and land preparation services at greater rates. Agro-dealers increased the availability and range of products offered (including new and improved seed varieties). Agro-agent expanded their models, both in terms of personnel and services offered (provision of extension services to farmers). Seed companies began working with multiple agro-dealers to try and overcome transportation challenges, while agro-dealers leveraged bulk orders to negotiate better prices. Offtakers started developing and testing new models which aimed to bring West Nile farmers closer to their supply-chain.

Within the 12-month pilot, the project achieved significant results related to farmers increased use of improved inputs and increased engagement in markets. Results also showed, however, that improving market opportunities requires a multi-year approach and further analysis and assessment to fill information gaps.

Improving market opportunities requires a multi-year approach. Within the 12-months, the pilot achieved significant results, especially relating to farmers increased use of improved inputs and increased engagement in markets. Results also showed, however, that there may be unexplored sales channels that offer greater market opportunities, and more importantly, greater profitability to farmers than those targeted under the pilot. Though further analysis and assessment is required, filling these market information gaps, as well as collecting data on yields, losses, prices, etc. (from programmes like the pilot) could help support the business case for farming as a worthwhile livelihood strategy.

The pilot highlighted gaps in understanding of market dynamics and sales channels with greatest potential for farmers in West Nile. Additionally, Pilot farmers showed a significant reliance on informal sources for market information. Farmers most commonly obtained market price information from agro-dealers (30 percent), traders (29 percent) and host community family and friends (29 percent); refugees, specifically, most commonly obtained market price information from NGOs (38 percent). While farmers have some understanding of market dynamics and pricing structure, an improved understanding among private actors and NGO partners may help develop a more compelling business case to farmers and enable farmers to make more informed decisions on which sales channels are best for them.

The pilot clearly demonstrated the need for future programming to address cross-cutting constraints such as access to finance, climate change and transport issues related to poor infrastructure. Whilst the pilot covered a number of components critical to driving systemic change within the agricultural sector, there were additional areas outside the scope of the pilot that, if successfully addressed, would support

farmers and other market actors in contexts similar to that of the West Nile. For instance, while the pilot promoted climate smart technologies in West Nile through use of improved seeds, climatic conditions remain a significant challenge that requires a more holistic approach and far greater resources.

Overall, the pilot provided a greater understanding of what is possible, raised critical issues about which components of a market-based approach work well in this context, and where investment is required to support further learning on market-based information gathering, change and development.

Section 1: Introduction & Background

Introduction

The evaluation of the pilot demonstrated great potential for use of a market systems development approach in a humanitarian context. The results indicated behavioural shifts among actors at all stages of the agricultural value chain and potential for larger scale agriculture, beyond subsistence alone, to increase farmers' incomes in the region. Five cross-cutting themes emerged as key to better understanding and learning from the use of a market systems development approach in a humanitarian context including: (1) the important role social capital plays in facilitating access to goods, services and information; (2) climate smart approaches and understanding external challenges (3) early signs of market systems change; (4) capital and financing as a gap and a critical component for scale; and, (5) learning, adapting and reaching scale.

To pull out the pilots' successes, challenges and learnings related to each theme, this report is organised as follows: Section 1 provides background related to the market systems approach, specific intervention activities and partnerships involved, a high-level summary of the mixed-methods project evaluation conducted and a brief overview of the regional context of agriculture in northern Uganda. Section 2 provides in depth analysis of the successes and challenges around each of the five themes identified from the results of the evaluation using a combination of quantitative and qualitative support; additionally, key takeaways and learnings are highlighted to inform NGOs and donors looking for ways in which to work in the market-based development space. Section 3 provides conclusions as well as outlines key takeaways around pilot learnings and provides short and long-term focus areas in which donors and the NGO community can facilitate market systems development in a humanitarian context.

Background

Regional context

The West Nile region of Northern Uganda is 90 percent rural with 27 percent of people living under the regional poverty line.³ Agriculture, whilst one of the most common livelihoods in the West Nile region, has primarily been smallholder based, with farmers owning small plots of land on which they grow crops for consumption and one or two cash crops and rely almost exclusively on family labour.⁴ The region is also home to some 0.83 million refugees, primarily from South Sudan (of the 1.3 million total in Uganda), the majority of whom

³ Defined as individuals in households that spend less than what is necessary to meet their caloric requirements and to afford them a mark-up for non-food needs (UNHS, UBOS 2016/17). Average per capita expenditure in the region was 58,500 UGX (2009/10 prices) (UNHS, UBOS 2016/17). Levels of income are also very low; 53 percent of refugee households earn less than UGX 500,000 (GBP £100) annually compared to 31 percent of host community households (UNHCR Livelihoods Socioeconomic Assessment in the Refugee-Hosting Districts, 2017).

⁴ Among pilot farmers, this is evidenced by small land holdings (median of 1.22 acres planted), low levels of mechanization (10% of farmers used tractor, 41% used animal traction), low percentage of farmers that sold produce (less than 20 percent), as well as the lack of critical market actors such as agro-dealers, extension workers and offtakers in the region. Note endline figures cited.

are likely to be displaced long-term. The farmers targeted for the pilot are mainly located in Yumbe and Moyo districts, and the refugees specifically, within the settlements of Bidibidi (established in August 2016) and Palorinya (established in December 2016), which are situated within community lands and communities, affecting the local market, economic, social and environmental situation. The populations of both Yumbe and Moyo districts are highly dependent on local, natural resources to sustain their livelihoods. The land itself is used to farm and raise livestock, while the woodlands provide firewood, the primary source of fuel in the region.⁵ In this context, households face significant environmental challenges that are exacerbated by the arrival of such a large number of refugees. The region faces a number of additional challenges including high recent population growth (leading to high unemployment), climate change and pest issues, poor infrastructure (that increases the cost of doing business in the region), lack of access to capital and technological advances, lack of economic opportunity, remote location and distance from the capital city of Kampala, market distortions due to influx of aid money and/or close markets in South Sudan and the DRC, and sensitivities over land rights.



Mercy Corps team member, Immaculate Lunyolo discusses seed sales with Pascal, an agro dealer in Moyo District partnering with the pilot.

Photo Credit: Ezra Millstein

Approach, interventions and partnerships

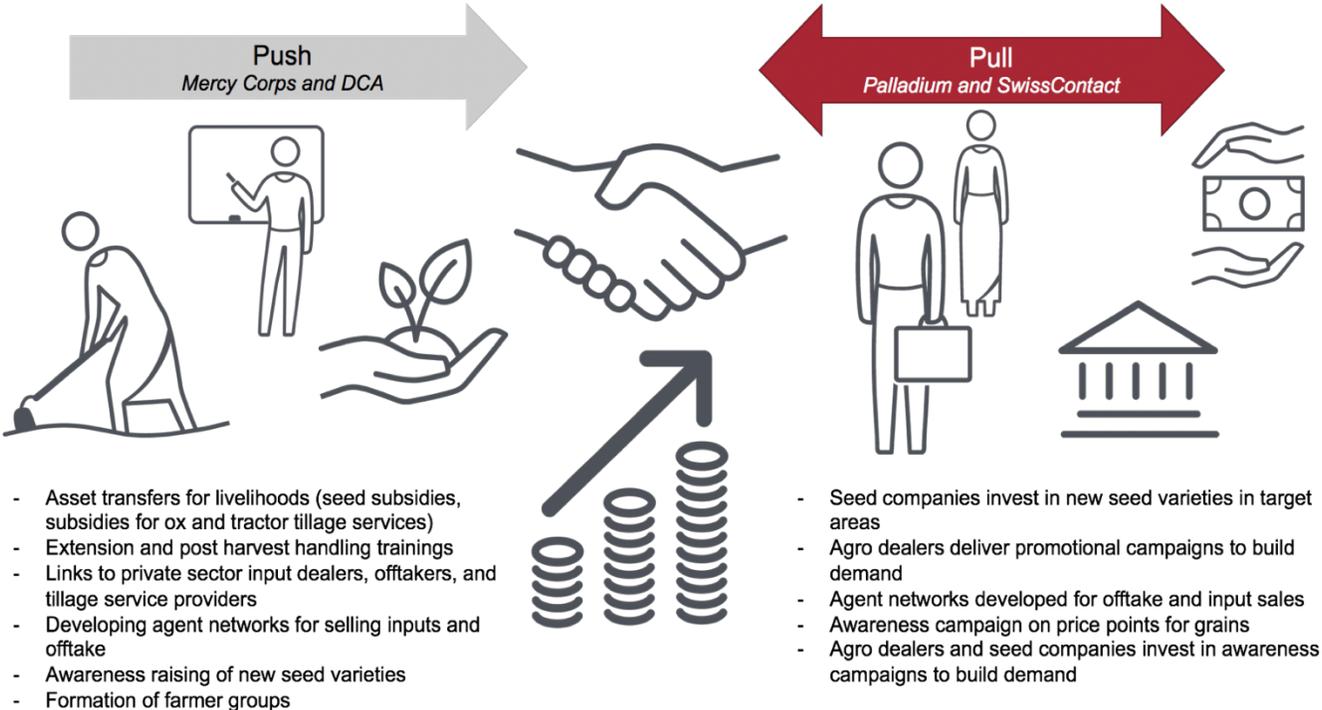
Recognising the lack of sustainability in a traditional in-kind response strategy to address its refugee crisis, Uganda has adopted a progressive approach to refugee hosting, offering significant opportunities to integrate longer-term resilience and development approaches within refugee and host population assistance. Understanding the need to identify a more durable solution to the refugee crisis, a small number of aid actors are exploring a market systems approach to strengthen the ability of displaced groups to engage with and benefit from markets. In this context, in July 2017 DFID contracted Mercy Corps, DanChurchAid (DCA) and Palladium to deliver a 12-month pilot programme, Demonstrating a Market System Approach in Bidibidi and Palorinya Settlements with the goal of contributing to increasing refugee and host community farmers' incomes

⁵ Yumbe district (containing the Bidibidi settlement), consists of both closed and open woodlands with the majority of households in the host community dependent on natural resources as their main sources of income, including agricultural production and the sale of fuel wood, charcoal. Moyo district (hosting the Palorinya settlement), consists mainly of woodland and savannah grasslands, with small scale business and farming predominating and land used for both settlement and agricultural purposes. The main crops grown include maize, sorghum, groundnuts and sesame seed, with firewood (and to a lesser extent charcoal) being households' primary sources of fuel. From the study "the environmental impact of settling refugees in refugee hosting areas in Uganda" conducted by the Centre for Research in Energy and Energy Conservation, Makerere University, Uganda (2018).

(economic welfare) in the region through growth of the agribusiness sector. The pilot targeted 3,500 host community and 1,500 refugee farmers within Yumbe and Moyo districts.

Historically, responses designed for protracted relief situations include traditional emergency livelihoods programming beginning at the outset, with private sector/market-based approaches coming later. The pilot was designed on the assumption that both should happen from the onset. That is, creating a response to meet the immediate needs of affected populations while, at the same time, enabling them to take increasing control of their own coping and recovery through local systems and resources. This approach included both rebuilding of refugees’ asset base to prepare them for market engagement, while at the same time getting markets to function better in these areas. The strategy is also based on the hypothesis that there are viable economic opportunities that the private sector could invest in to create a market for the products and services produced and used by refugee and host households. Thus, the aim of the pilot was to apply a blended Market Systems Development (MSD) approach to the agricultural sector in the West Nile region, supporting farmers from refugee and host communities and a range of private sector market actors to promote growth of the agribusiness sector and ultimately increase farmers’ incomes.

FIGURE 1: THE PILOT’S PUSH-PULL STRATEGY

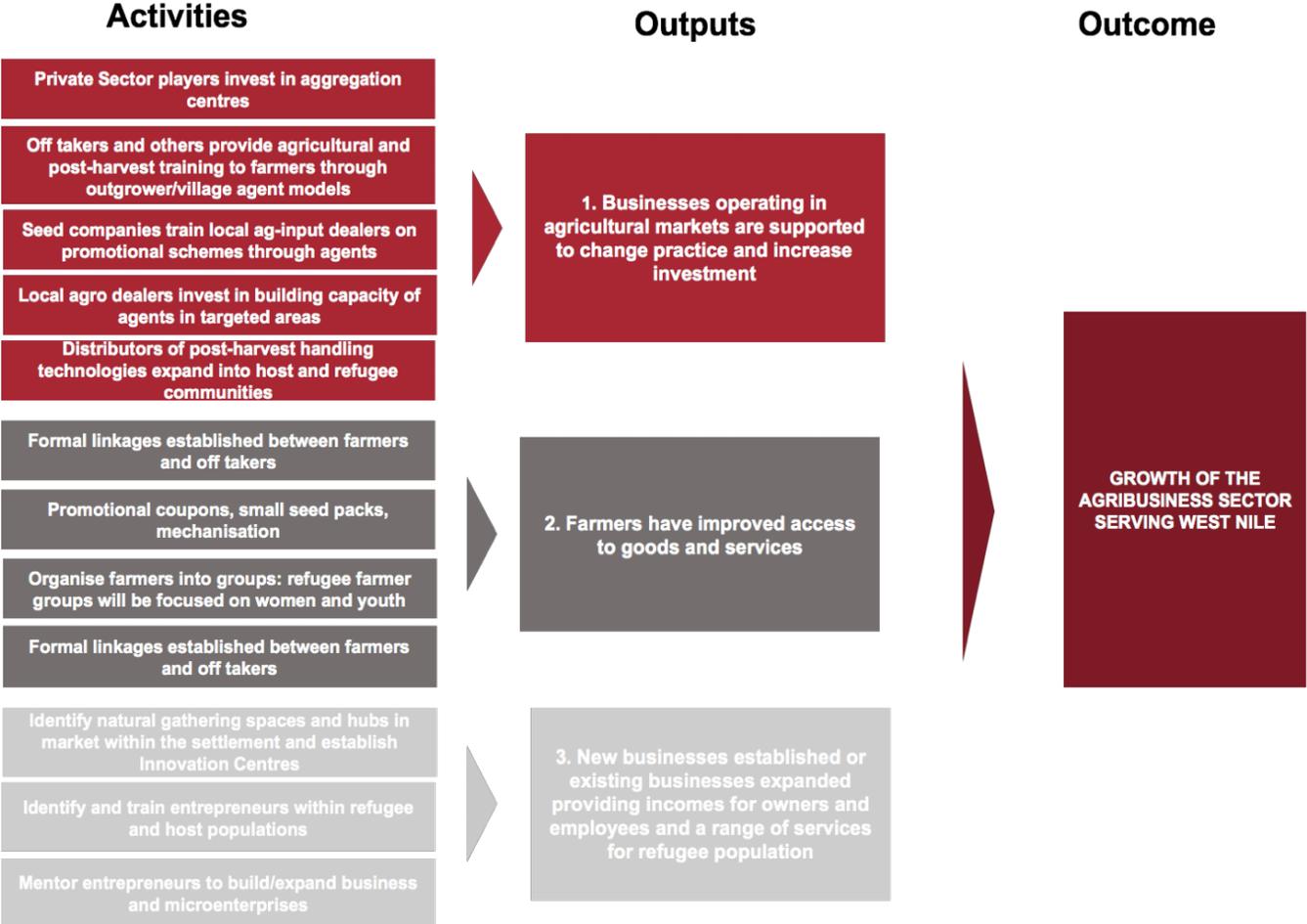


As outlined in Figure 1, the pilot employed a push-pull strategy to understand both what the critical push and pull factors were, as well as optimal sequencing of efforts.⁶ The push component mainly included strategies to ensure that refugee farmers had the tools, skills and experience required to be successful, with Mercy Corps and DCA targeting support for refugee farmers and agro-agents within the settlements. This strategy was based on the assumption that refugee farmers needed additional support, or “push”, to access goods and

⁶ Push strategies build capacities to engage in markets, while pull strategies expand the diversity and quality of accessible economic opportunities.

services (mainly, improved seeds and extension services) compared to host communities. Push activities included channelling vouchers for partial subsidies (between 30 and 60 percent) for improved seeds and tillage and tractor services through local agro-dealers and service providers, promoting land sharing between refugees and host communities by encouraging refugee farmers to approach host community farmers to broker informal land rental agreements and providing extension support and post-harvest handling trainings to farmers. Concurrently, the pull strategy was designed to engage the private sector in new markets and geographies, targeting host community farmers, agro-dealers, agro-agents, seed companies and offtakers.⁷ This aspect of the pilot was led by Palladium under the Northern Uganda -Transforming the Economy through Climate Smart Agribusiness Market Development (NU-TEC MD) programme. The pull strategy included activities to improve agro-dealers’ ability to access quality and climate smart inputs from national seed companies by brokering relationships and helping to build trust and understanding, as well as working with produce trading companies to attract them to West Nile and assist in developing agent networks.

FIGURE 2: THE PILOT’S OBJECTIVES AND ACTIVITIES⁸



⁷ Offtakers defined as traders that buy agricultural produce from farmers.
⁸ Note the third set of activities regarding innovation centres and entrepreneurs was not fully undertaken given time constraints thus the focus of the report is on the first two set of activities. The third component is being undertaken by Mercy Corps through follow on funding through 2020.

As detailed in Figure 2, the pilot undertook a number of activities involving actors at all points along the agricultural value chain (farmers, off takers, seed companies, agro-dealers and distributors) with the explicit goal of growing the agribusiness sector, and specifically, farmers' incomes. The pilot differentiated itself from other programmes operating in the region by requiring a cost share from farmers for inputs and services unlike other fully subsidised delivery models implemented by peer agencies. In specifically focusing on growing the agribusiness sector as a channel to increase farmer incomes, key activities under this programme included using partnerships among market actors to: (1) improve farmer access to goods and services (improved seeds, ox-plough and tractor services, agricultural extension, offtake services); (2) support businesses to change practices and increase investment in the region (investment in aggregation centres, post-harvest handling training and services to farmers, agro-dealer investment in agent network). Given the programme approach based in MSD, the partners used a facilitative approach to build capacity of market actors, raise awareness among farmers and a combination of cost-share models and subsidies to encourage uptake. By leveraging the power of markets, these strategies aimed to generate durable income opportunities in refugee areas and greater value for money on donor investments.

Importantly, the pilot was not meant to replace any livelihoods/social safety net projects, nor was it intended to target all farmer households. The goal was to identify and increase access for those households who could and wanted to produce commercially for market, making the focus on "early adopters". At the same time, the pilot sought to recognise the existence of a potentially lower risk tolerance among refugee farmers given their protracted displacement. In this way, implementers considered the pilot a blended market systems development intervention that required push interventions to prepare vulnerable refugees for market



The pilot sought to identify and increase access for those refugee and host households who could and wanted to produce commercially for the market.

involvement. The assumption that refugee households require more intensive support to access seeds, land, tractor services and offtake markets was central to the pilot's design and implementation strategy.

The pilot aimed to demonstrate that a blended market-based approach to humanitarian assistance could be a more efficient, effective and sustainable way to support

refugee and host community livelihoods in the region. Although implemented over the short time frame of one year, the pilot's approach aimed to support farmers to be self-sufficient over time, through increased engagement with agribusiness and ultimately increased incomes. By reducing and/or eliminating reliance on direct assistance, an approach based in MSD provides a more sustainable alternative to in-kind assistance. The pilot also aimed to build the capacity of local market actors to provide farmers with resources (inputs, extension, etc), thereby increasing delivery efficiencies by eliminating the need for aid actors to deliver such services. Finally, the pilot aimed to increase effectiveness compared to traditional in-kind aid by allowing market-driven programme uptake, rather than utilising direct targeting of beneficiaries. By requiring some cost-share, only those farmers willing and able up took the programme, eliminating duplication and mistargeting.

Evaluation

In order to more fully assess the effects and value of the pilot, and the efficacy of using a market-systems inspired approach as part of a humanitarian response, a mixed methods endline evaluation was conducted in July 2018. The primary purpose of the pilot endline evaluation was to provide tactical recommendations for evidence-based decision making related to programme design, targeting, and implementation. A secondary objective was to provide evidence to inform strategic directions and future implementation of MSD approaches

as an alternative to traditional humanitarian approaches (in-kind assistance and direct delivery of livelihood support).

The evaluation sought to answer a number of questions (see Appendix for full list). Key evaluation questions are summarised as follows:

- What changes / outcomes / achievements have taken place, specifically among farmers (incomes, use of post-harvest handling practices and technology, access to markets, participation in market sales, use of improved seed varieties), as well as other actors along the agricultural value chain (seed companies, agro-dealers and distributors)?
- How have these changes / outcomes / achievements been brought about?
- How sustainable and scalable are key changes / outcomes / achievements?
- How do the changes among farmers vary between sub-populations of interest (refugee and host communities, male and female farmers, Yumbe and Moyo district, and farmers under 25 and those over 25 years old)?
- What role did social capital/social connectedness play in the spread and uptake of an MSD intervention?
- Did the project correctly identify and institute climate SMART practices?
- What was learned regarding the successes and failures of the programme?

Overall, the evaluation provided a clearer picture of agricultural activities in the region, as well as provided in-depth understanding regarding the successes and challenges of the pilot from the perspective of actors spanning the entire agricultural value chain.

As the quantitative component of the evaluation, 490 individual farmers were interviewed from host (216 farmers) and refugee (274 farmers) communities in Moyo and Yumbe districts. A cross-sectional rather than panel design was chosen since programme uptake was market-driven, the result of agro-dealer led marketing of seeds, rather than through prior, direct targeting of beneficiaries. While the quantitative component of the evaluation interviewed different farmers from baseline to endline, it served to provide two snapshots in time of the state of farmers in the region at the start and end of the pilot, identified key differences within subgroups of the population useful for future targeting and programme expansion, and helped triangulate findings with the qualitative work conducted. In total, 47 qualitative interviews and/or focus groups were conducted at endline, which included host and community farmers, private sector companies (both partners and non-partners), innovation centre partners, refugee welfare committees, OPM, UNHCR and donors and NGOs.

Pilot farmer context

The following information collected from the qualitative and quantitative surveys provides background contextual information among the pilot farmers.

Demographics

While different farmers were interviewed at baseline and endline, there were a number of key demographic similarities between the groups as well as a few key differences, particularly as they related to refugee versus host community farmers. With regards to gender, overall programme uptake was balanced among men and women. However, refugee farmers were significantly more likely to be women. The majority of pilot farmers were between 25 to 59 years old. At endline, a greater proportion of refugees (28 percent) were 25 to 34 years old compared to host community (17 percent) farmers, while a greater proportion of host community farmers were over 60 years old (17 percent). At baseline, farmers were significantly less educated (34 percent never attended school), than farmers at endline (18 percent). Additionally, refugees were significantly more likely to have never attended school at baseline (46 percent). The majority of all farmers were married at both periods (about 80 percent). At baseline, host community households were significantly larger than refugee households (8.1 versus 5.3 members), with household size equivalent among refugee and host community households at endline (7.7 members). At baseline, refugee households were significantly more likely to be female headed than host community households (20 percent versus 8 percent), though there were no significant differences at endline. Although Coping Strategy Index (CSI) scores remained stable (about 22 for both periods), they increased slightly among refugee households from baseline (20) to endline (25).¹⁰ Refugee households also spent significantly less than host community households at both time periods, though expenditure among refugee households at endline was higher than baseline.

Livelihoods strategies

At endline, 78 percent of farmers reported at least one source of income, with host community farmers (83 percent) significantly more likely to have an income source compared to refugee farmers (66 percent). Average expenditure among farmers' households was \$301 PPP per month, with host community farmer households (\$371) spending significantly more than refugee farmer households (\$140). Among the most commonly reported income sources were sale of crops (53 percent), casual labour (41 percent) and petty trade and commerce (30 percent).¹¹ 57 percent of farmers engaged in some type of agricultural business activities (produced and/or processed crops or livestock



A South Sudanese refugee digs up hot charcoal from the pit where it is being made. Research by the FAO indicates that if the current rate of wood consumption continues in Northern Uganda, the area is likely to be deforested in three years. Each person is using an average of 3.5 kgs of firewood (20.5 kgs per household) each day and selling charcoal is a key way both refugees and hosts make money.

Photo credit: Ezra Millestein

⁹ Food and Agriculture Organization of the United Nations and UNHCR, Rapid Woodfuel Assessment 2017 Baseline for Bidibidi Settlement, 2017. Retrieved from: [http://www.safefuelandenergy.org/files/FAO_UNHCR_Woodfuel%20Assessment_Bidi%20Bidi_Uganda_FINAL\(2\).pdf](http://www.safefuelandenergy.org/files/FAO_UNHCR_Woodfuel%20Assessment_Bidi%20Bidi_Uganda_FINAL(2).pdf)

¹⁰ While the cause of the increase is unclear, the higher score at endline is indicative of higher food insecurity (and more severe coping strategies). While the Index is context specific, in general a low CSI score is between 0-50, medium 51-100 and high over 100.

¹¹ Host farmers (57 percent) were significantly more likely than refugee farmers (41 percent) to have income from sale of crops while there were no significant differences for casual labour and petty trade and commerce.

for sale).¹² The main agricultural enterprises engaged in included crop/vegetable farming/selling (93 percent), small livestock keeping (34 percent) and buying/selling crops (11 percent). 51 percent of farmers at endline reported sales of at least some of their produce, with host community (54 percent) significantly more likely than refugees (43 percent) to have sold produce.¹³

Natural resource constraints

Host community farmers cited constraints around availability of natural resources such as firewood and charcoal for cooking and heating and rushes, which are commonly used as roofing for houses. The region has experienced large deforestation as a result of the vast refugee settlements. Other related problems included diminished quality and availability of water. Furthermore, with resource constraints on firewood, people are forced to search for wood outside their own communities, resulting in social tensions especially when refugees move outside of settlements into host community areas to find firewood and rushes to roof their houses.



A young South Sudanese refugee carries firewood home in Bidibidi Settlement, Yumbe District

Photo credit: Ezra Millestein

Land access

The land allocation system managed by OPM provided all refugees with a small plot of 30 x 30 meters to build their home and carry out small-scale subsistence farming.¹⁴ Outside formal land allocations, refugees relied on informal transactions with host communities to access land for farming. Of the 53 percent of refugees with land access off settlement, 42 percent had access via formal (written) agreements with host community members, 52 percent via informal (verbal) agreements with host community members and 6 percent via land given from OPM or other means. The most common type of arrangement was the exchange of commodities or a cash payment, typically of between 80,000 – 100,000 UGX per acre per year.¹⁵

Credit access

57 percent of farmers cited inadequate capital as a barrier to making their agricultural activities more successful, with no significant differences among host community (56 percent) versus refugee (60 percent) farmers, nor male (57 percent) versus female (58 percent) farmers. Indeed, inadequate capital is the second most commonly cited limitation related to making agricultural activities more successful.¹⁶ In terms of access

¹² Reference period was the six months prior to the survey period. At baseline, 44 percent of farmers engaged in agricultural business activities, with host community farmers significantly more likely to participate than refugees.

¹³ There is a significant difference between baseline (15 percent) and endline (51 percent). Hosts were also significantly more likely to have sold produce at baseline (19 percent) compared to refugee farmers (4 percent).

¹⁴ The land accessed by OPM is host community-owned and offered as a result of negotiations between the Ugandan government and local communities in refugee-hosting districts. For more information about OPM's role in providing land access to refugee-hosting districts see <https://www.westnileweb.com/news-a-analysis/yumbe/opm-begins-land-allocation-to-refugees>

¹⁵ Pilot programme data showed a range of 25,000-120,000 UGX, with values most commonly 60,000-80,000 UGX.

¹⁶ Limitations to more successful agricultural activities listed in order from most to least commonly cited: Inadequate rainfall (93 percent), inadequate capital (57 percent), other miscellaneous (44 percent), lack of land (32 percent), lack of inputs (31 percent), lack of knowledge on farming practices (18 percent), fluctuation in prices (16 percent), lack of credit (15 percent) and

to credit, at endline 63 percent of farmers report borrowing money or goods on credit within the prior year (35 percent at baseline). Among those that borrowed, VSLAs (70 percent) and friends/family (26 percent) were the most common sources, with few farmers borrowing from formal banking institutions. At the time of the survey, the nearest formal bank was in Arua although banking agents had begun to operate in Yumbe. While mobile-money initiatives have progressed, there were still many challenges, particularly in the West Nile context, including limited networks and lack of trust of mobile money platforms, particularly among refugees. Recent taxes imposed on mobile-money in Uganda also make mobile money less viable.

Agricultural production

In terms of the state of agricultural production in the West Nile, at baseline, farmers who had planted in the previous season planted an average of 2.8 types of crops over an average of 2.0 acres.¹⁷ The average harvest at baseline was 329 kg across all crops (median of 171 kg)¹⁸. Sesame and sorghum were most commonly planted, with average harvests of 128 kg and 130 kg, respectively. At endline, farmers who had planted in the previous season planted an average of 1.8 crops on an average of 1.67 acres.¹⁹ Average harvested quantity across all crops was 929 kg at endline (median of 54 kg)²⁰. Average yield was 331 kg among refugee farmers (median of 37 kg) and 1,837 among host community farmers (median of 145 kg).²¹ Maize and groundnuts were most commonly planted, with average yields of 71 kg and 49 kg, respectively.²²

With this context, Section 2 turns to evaluate the pilot around five cross-cutting themes.

Section 2: Key Themes

Section 2 provides in depth analysis of the successes, challenges and lessons learned around five themes (social capital; climate smart approaches and understanding external challenges; early signs of market systems change; capital and financing; and, learning, adapting and reaching scale) that emerged from the evaluation. The sections that follow utilise a combination of quantitative and qualitative evidence to answer key research questions - mainly what changes occurred, how such changes occurred, and what key barriers to better outcomes remain. Specific focus is given to understanding key differences between groups including refugees, women, farmers in Yumbe (versus Moyo) and youth. Finally, the report provides specific ideas for programme design, targeting, and implementation based on lessons learnt, for both immediate as well as multi-year support of a market-based approach to development in the West Nile region.

Social capital - building and sustaining relationships and trust

The pilot sought to facilitate and build relationships among key market actors at all points in the value-chain, to improve access to agricultural production resources and information. In theory, such activities support increased farmer uptake of products and services as well as improved business relationships among market

unavailable market for produce (15 percent). The main differences between host communities and refugees were involving lack of land and inputs, whereby refugees were more likely to report these as a limitation compared to host farmers, as well as fluctuation in prices and inadequate rainfall, whereby host farmers were more likely to report as limitations.

¹⁷ Median of 1.0 acres

¹⁸ IQR = 100-400 kg

¹⁹ Median of 1.5 acres

²⁰ IQR=15-152 kg

²¹ Refers to overall harvest yield and does account for land size planted. Average yield is not statistically significant between refugee and host community farmers (due to large standard errors), though again, does not account for land area planted.

²² Maize IQR=15-100 kg; groundnuts IQR=10-60 kg

actors. Recognising the limitations surrounding the short time frame, the pilot sought to better understand the extent to which social networks within communities acted as a source of coping and recovery for refugees, what if any benefits there were among host communities and how programmes like the pilot may leverage social networks. Additionally, consideration was given to understand which groups were able to establish connections and which were not to ensure there were no unintended (active or indirect) exclusions as the result of any programme activities.

To achieve this, the pilot delivered a number of activities related to building social networks including: (1) incentivising host community landlords to give refugee farmers land access in exchange for tillage services; (2) supporting and cost-sharing marketing activities between agro-dealers and farmers to raise awareness of improved seeds; (3) supporting farmers to form groups using a lead farmer model to share knowledge and good agronomic practices; and, (4) introducing agro-dealers to larger Kampala based seed companies and incentivising larger Kampala based seed companies to do business with agro-dealers, giving agro-dealers access to improved and climate smart seeds and other inputs. The following section provides the key findings from these activities.



Cooking sesame in Palorinya Settlement, Moyo District. Sesame is a key crop in West Nile and improved sesame seeds were promoted through the pilot.

Photo Credit: Ezra Millstein

The pilot incentivised host community farmers to give land to refugee farmers by offering free tillage services on one acre of their land for every five acres rented out to refugee farmers. To improve land access for refugee farmers, the pilot incentivised host community farmers to rent land to refugee farmers and paid for one acre of the host community landlords' land to be tilled for every five acres of land they rented to a refugee farmer. Once refugee farmers secured the land, the pilot additionally provided a subsidy of 60 percent for tractor tillage for their land. In Palorinya settlement where there were a high number of ox-plough service providers within the host community (who were also potential landlords), the pilot used the same approach, providing a subsidy for ox-plough tillage. At endline 53 percent of refugees had planted off settlement during the previous season, with a median planted area of one acre, indicating refugees were able to access additional land for production beyond their 30 x 30 meter settlement plots. Indeed, refugee farmers felt the pilot played a significant role in supporting them to talk to host community landlords to acquire land, both as a result of the tractor and ox-plough interventions, as well as broader encouragement and guidance on how to engage host community landlords (of the 53 percent of refugees that planted off settlement, 42

percent rented from a landlord in a host community). Refugees deemed this informal approach more effective than waiting for government intervention.²³

Refugee farmers independently accessed land off-settlement via social connections with host communities but face challenges with informal land rental agreements. Qualitative and quantitative findings indicated predominantly verbal land rental agreements. Beyond the incentivised activities delivered by the pilot, refugees explained they acquired land by interacting with neighbours within the community and forming friendships over time. Most refugees reported that the process was relatively easy, with only few mentioning language barrier issues. One lead farmer explained on behalf of a member of his group, “For him he has never been here in Uganda before – this was the first time. Just like any other human being, when you are taken somewhere you have to get to know people -you just say hi, then the next day you find you have one or two friends. That’s how he created the relationship with his landlord.”



South Sudanese refugees harvest crops from their fields alongside their Ugandan landlords just outside of Palorinya Settlement, Moyo District.

Photo Credit: Ezra Millstein

Field observations indicated trading goods was also a key way relationships were formed between refugees and host community members. Both groups used bartering to secure a range of assets and services including land, labour, produce and raw materials. Host communities viewed the influx of refugees as a market opportunity stating, “It has created a local market for us in a way that after planting these small fruits and vegetables we can sell to them and create income...Another challenge they face is that those refugees are not given clothing, so they sell food rations to buy clothing. So, the food they are given, they sell part of it, and then buy other things...”. For host communities, the opportunity to rent land to refugee farmers also provided an alternative income source and enabled them to get what was often virgin land prepared for them by refugee farmers for their own future use.

²³ Whilst farmers are to a large extent happy with this model, there are still challenges. One challenge is the issue of land insecurity; given that there is no formal agreement, refugees cannot be sure that the landlord won’t take the land from them at any time. Indeed, there were cases of this reported by refugees, though they were minimal. Unfortunately, when they did occur, what mainly happened is that refugees would prepare the land and then landlords would take the land back once it was ready for planting. While only a few respondents encountered such landlords, such cases may discourage longer-term and larger investments unless local government and OPM are able to support a mechanism for the formalisation of rental agreements between refugees and hosts. Such efforts toward testing accountability mechanisms are already moving forward in Moyo District.

While the above demonstrates relative success in land acquisition without programme intervention, there were several cited limitations of such informal rental agreements. One complaint, cited by several refugee farmers, was that host community farmers lent poorly prepared or virgin land, with the intent that refugee farmers cleared and prepared the land, and then host landlords took the land back once prepared after the first season - essentially using refugees as free labour. Refugee land access arrangements remained largely informal with host community landlords and it was unknown how long they would last. Most refugee farmers explained that host community landlords had verbally committed to lending them land for an open-ended amount of time; or “until they return to South Sudan”, but time will tell the extent to which these commitments are honoured. It is not clear how common these cases were beyond the few farmers qualitatively interviewed but highlights one potential advantage of more formal arrangements compared to such informal ones and could be an important area of focus for future programmes.

The lead farmer model used by the pilot selected competent farmers from refugee communities who were trained and tasked with passing information on in their community. At endline, many farmers referenced lead farmers as a key source of information on farming practices.

The pilot delivered extension services using lead farmer models with refugee farmers which increased information sharing on farming practices and improved social connections. The most common sources of farming information among farmers were NGOs (49 percent) and host community family and friends (39 percent), with refugees more likely (68 percent) than host community farmers (41 percent) to have used NGOs as an information source²⁴, while host community family farmers (43 percent) were more likely than refugees (31 percent) to use host community family and friends. Indeed, several farmers from both the refugee and host communities noted sharing information on farming practices was common. The lead farmer model used by the pilot selected competent farmers from refugee communities who were then trained and tasked with passing information on to other farmers in their community. This model was particularly effective, with many refugee farmers referencing lead farmers in their community as a key source of information on farming practices. Refugee farmers also frequently felt their knowledge of farming was better than host community farmers. One refugee farmer said, “My neighbour, I saw one who adapted her field when she saw my field, and how I had spaced my maize.... When there was so much sunshine, some of her crops were very small and when she saw how mine were still growing she started uprooting them. She copied me and now her crops are good. I imparted my knowledge indirectly.” One of the agro-dealers supported by the pilot also commented that refugee farmers appeared more knowledgeable than host community farmers. He explained refugee farmers came to him and asked for a particular chemical whereas host community farmers came, explained the condition and asked him to determine the type of chemical needed. However, refugee farmers looked to host community farmers for information on seasonality of produce, weather patterns and market demand. One refugee farmer said, “...they advise us on the seasons here because we are new so we don’t know the seasons. So, they’ll tell us how it is and how it changes. Yes, and also the type of crops they grow here.”

The pilot strengthened relationships between seed companies and agro-dealers, inspired agro-dealers to engage in more marketing activities and illustrated market opportunity to agro-dealers. The pilot engaged two agro-dealers throughout the pilot: one in Moyo and one in Yumbe. At the start of the pilot, these were the only two active agro-dealers with shops. Under the pilot, Palladium supported agro-dealers by

²⁴ From the qualitative interviews, significantly more refugee farmers talked about trainings that they had received from NGOs or private companies such as the Gulu Agricultural Development Company (GADCO), a social enterprise engaged by the project to support delivery of training and extension services.

mobilising farmers through the voucher activities, and co-funding public awareness activities for improved seeds and inputs in host markets while Mercy Corps and DCA supported the agro-dealers delivery of awareness activities in refugee settlements. Palladium also connected and helped build relationships between the agro-dealers and larger seed companies such as East Africa Seeds, NASECO and Farmers Service, all based in Kampala. Whilst the agro-dealers already had relationships with some seed companies, they were not able to negotiate credit terms or order large volumes and often felt inferior to larger customers, such as NGOs that bought in bulk. Under the pilot, the project acted as a guarantee to initiate credit terms. Within the pilot, all agro-dealers paid the credit owed to seed companies. At the end of the pilot, order volumes were growing and seed companies were still allowing credit terms. The owner of Alpha in Yumbe said, “We can't

At the end of the pilot, the volumes of seed orders being placed by agro dealers in West Nile were growing and seed companies maintained the credit-scheme for agro dealers adopted under the project. Agro dealers also noted an interest in maintaining seed promotions citing the success of radio adverts.

always fulfil orders because NGOs order in large volumes.... sometimes we are given credit but it requires a relationship and trust – the pilot helped to build that. That is the beauty of the pilot that they connected us with seed companies making us known by those people. They have built that trust now, so they can give us seeds on credit, so we sell and take their money back after.”

Similarly, when asked how they have changed their businesses practices, Uмба Vets in Moyo said, “One of the things I have learnt and want to keep is promotions. Under the pilot programme we had radio adverts and when we started the adverts I kept getting calls and then some of the customers came and told me they heard over radio. So, I think the radio advert is working. And also, we have SMS,

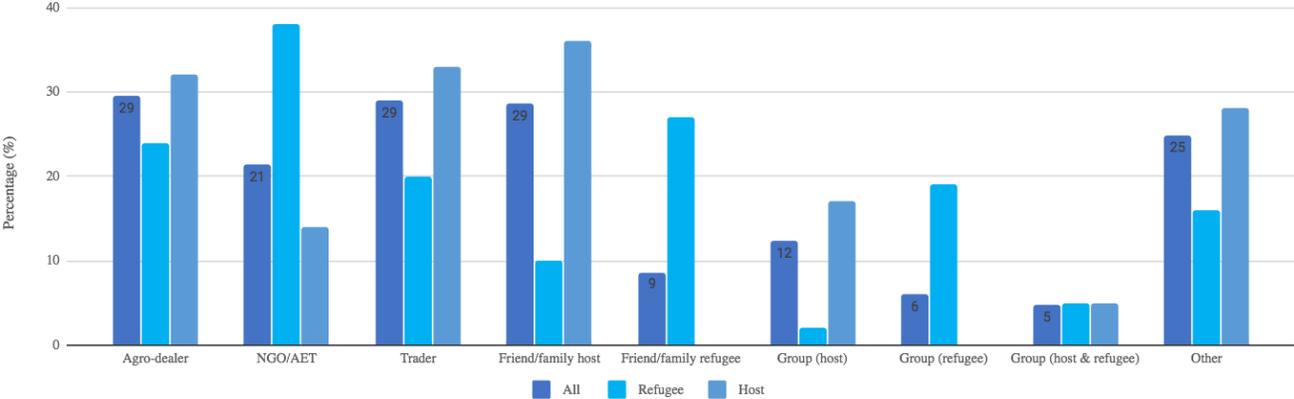
sending messages to the farmers. The feedback I get is that the farmers like it. The cost is a bit high but it's something I'll consider keeping”. Additionally, Alpha began building a farmer database in order to contact farmers with promotions and information and also said that they were collaborating with seed companies to provide trainings to farmers. Alpha also recognised the importance of awareness raising, sensitisation and building relationships with seed companies although had made less progress in continuing to deliver these activities. In April 2018 a new agro-dealership opened in Moyo, based on recognition of increased demand for improved seeds and other inputs following seed fairs hosted by NGOs in the region, which sold pesticides, seeds, fertilisers and tools and equipment. The shop planned to expand their operations through an agent network for 2019. Further strengthening the relationships between agro-dealers and seed companies while building the capacity of agro-dealers to negotiate prices, build credit terms and manage bulk orders, would help to strengthen this component of the supply-chain by enabling agro-dealers to more effectively meet farmer demand.

The pilot refugee farmers improved relationships with agro-dealers and showed a continued interest in the use of improved seeds. A group of farmers from the refugee settlement in Palorinya East purchased improved seeds from an agro-agent of Uмба Vets (also based in Palorinya East) but received a lower than anticipated yield and suspected insufficient storage conditions as the cause. The next season they went to Moyo Town and purchased seeds directly from the main agro-dealer store as they felt the storage facilities were better and wanted to draw a yield comparison. This case demonstrates an impressive amount of knowledge and awareness as well as a commitment to utilising improved inputs given the transport costs to reach Moyo are 30,000 UGX return. Related, some farmers requested better packaging and labelling for

seeds so that they knew exactly what they were purchasing. Farmer trust in agro-dealers thus emerged as a critical factor to ensuring (continued) use of improved seed varieties. This demonstrates how the activities related to raising awareness and encouraging uptake resulted in wider interest among farmers to use of improved seeds.

The pilot demonstrated the need to reduce information asymmetries between farmers and offtakers to help farmers determine the best market route. Farmers expectations regarding market prices often did not align with those offered by project-supported offtakers. 44 percent and 49 percent of farmers at baseline and endline respectively cited unfair prices as a constraint to selling produce. Host community farmers (49 percent) were more likely than refugees (31 percent) to cite unfair prices as a constraint at baseline, while female farmers (55 percent) were more likely than male farmers (43 percent) to cite unfair prices as a constraint at endline. Farmers most commonly obtained market price information from agro-dealers (30 percent), traders (29 percent) and host community family and friends (29 percent), with host community farmers more likely than refugee farmers to obtain information from each of the aforementioned sources. Refugees most commonly obtained market price information from NGOs (38 percent at endline). Reliance on NGOs as a source of market information, particularly among refugees, raises concerns around sustainability as well as the consistency and quality of the information provided. Whilst NGOs operating in the region provide vital support, long-term they may be more effective in a role to identify other market actors (private companies, government agencies) better placed to take on these roles, while the NGOs themselves focus resources on building capacity of such market actors rather than direct provision of services.

FIGURE 3: FARMER SOURCE OF MARKET PRICE INFORMATION



Interestingly, although the prices offered by project-supported offtakers were lower than local market prices, they were consistent with prices offered throughout Uganda and constituted a “cash in the bag” price, covering handling, transport, packaging, value-addition and taxes. While further research needs to be undertaken to more fully understand misalignment on price, one social enterprise offtake company explained that the prices offered by buyers from DRC and South Sudan were considerably higher than the landing price in Kampala they were able to offer. In previous seasons, this offtake company worked with buyers to push for higher prices but by the time they negotiated higher prices, local prices had increased again. These findings demonstrate that farmers were aware of prices in different markets and understandably sought to maximise profit. However, they also indicate gaps in programme implementers’ understanding of market dynamics and would need to be further addressed in future programming. For example, it is unclear how long-term demand from buyers in the DRC and South Sudan compares to Kampala and which provides greater sustainability and

profitability to farmers. While farmers have some understanding of market dynamics and pricing structure, an improved understanding among private actors and NGO partners related to the driving costs of production in West Nile may help develop a more compelling business case to farmers and enable farmers to make more informed decisions on which sales channels are best for them.

Along multiple points in the agricultural value-chain - from planting to sales - relationships and trust emerged as key enabling factors in some regards and key barriers to success in others with regards to growth of the agribusiness sector in the West Nile region. The pilot helped build and strengthen relationships between key actors throughout the value-chain to increase access to resources (e.g. informal land rental), build efficiencies (e.g. agro-dealer and seed company distribution), demonstrate the value of inputs (e.g. agro-dealers reputation for selling valuable produce) and enhance understanding around farming (e.g. farming information exchange), all of which support growth of the agribusiness sector in the region. In contrast, information asymmetries with regards to market dynamics hinders agribusiness growth. Broadly, the pilot demonstrated that strong social capital supports growth of the agribusiness sector through improved access to and sharing of information, services and assets such as land among and between market actors.

Climate smart approaches and understanding external challenges

An implicit focus of the pilot was to increase farmers' resilience to the effects of climate change through promotion of improved (drought-resistant) varieties of seeds. Given the seasonality of agriculture, the timing and quantity of rainfall is critical to farmers' ability to prepare land adequately and plant on time. However, at endline over 90 percent of farmers cited inadequate rainfall as a key barrier to making their agricultural endeavours more successful. Farmers stated, "We are planning for the second season waiting only if it rains. The land is already prepared now we are waiting for the rain. But due to climatic conditions, last season we planted we got something but others because of the disaster they got nothing." Reinforcing farmer responses, a study completed by FAO in 2018 in refugee-hosting districts also found drought, water shortages and crop pests and diseases were the primary shocks impacting refugee and host communities in West Nile.²⁵ Moreover, responses from host community farmers suggested climatic conditions had deteriorated in recent years, "Right now, we have always known July for having rains but as we talk now there is no rain. They are quite poor let me say." Refugee farmers cited the additional challenge in adapting to different climatic conditions. One refugee farmer concluded, "If you compare the area where we



²⁵ Food and Agriculture Organization (FAO): Food Security, Resilience and Well-Being Analysis of Refugee Hosting Communities in Northern Uganda.

came from and here, the soil texture of southern Sudan is better. Here it is rocky. And then also the rain pattern, is not so harsh like the one here.” Given the prominence of climate and land quality as they relate to farmers’ ultimate success, the following section explores climate smart approaches promoted through the pilot, as well as external climatic and land quality challenges.

The pilot promoted climate smart technologies in West Nile through use of improved seeds but climatic conditions remain a significant challenge requiring a more holistic approach and far greater resources. The use of climate smart practices and technologies is a priority for many large-scale agriculture programmes, including the DFID funded Northern Uganda-Transforming the Economy through Climate Smart Agribusiness Market Development Programme (NU-TEC MD) implemented by Palladium. The pilot applied some of the same practices and technologies in West Nile although these were limited in scope due to the timeframe of the pilot. The pilot selected crops (and thus improved seed varieties) that would work within the agro-ecological conditions of Moyo and Yumbe districts including sorghum, rice (upland variety), groundnuts and sesame, all of which are also drought tolerant²⁶ and widely accepted with potential for generating surplus that could then be used for local consumption.

The pilot also offered extension education for refugee farmers focusing on post-harvest handling (PHH) and storage (through offtakers), which aimed to reduce farmer’s risk of grain loss and boost economic resilience. Among the two-thirds of farmers that received any extension service within the six months prior to the survey, only 30 percent received training on pest management and just 8 percent received training on water management despite these being commonly cited issues. Moreover, access to extension²⁷ was more limited among refugee farmers (60 percent), compared to host farmers (71 percent). However, among host community farmers, who relied on receiving information on GAP and PHH from agro-dealer agents trained by seed companies at the start of every season, female farmers had more limited access (65 percent) compared to male farmers (76 percent). Additionally, the use of post-harvest handling (PHH) practices was relatively low. About half of farmers used two or more PHH practices and at least one PHH technology, with the majority of farmers requesting further training in these areas.²⁸ Again, host community farmers (59 percent) were more likely to use such technologies as compared to refugee farmers (44 percent), with no significant difference by gender. The most requested areas to adopt modern practices were for line planting and weeding.

The Accelerated Fund for Regional Development (AFAD), an organisation operating in West Nile for the past 20+ years, has also tested a number of climate smart initiatives in Yumbe, specifically referencing drip irrigation, staggered agriculture, and improving access to meteorological information. However, when interviewed, they cited major barriers to success including the length of time required for initiatives to be effective, the high level of knowledge required and high cost to adopt climate smart practices and technologies.

²⁶ Groundnuts additionally serve to fix nitrogen in the soil and is a good rotational crop with sesame and sorghum.

²⁷ Access to extension question was asked in general (i.e. from any extension source) and not specific to extension provided through the pilot which provided extension to refugee farmers.

²⁸ PHH practices include drying, sorting/grading, bagging and weighing, treatment of grains, cleaning and repairing storage, establishing storage facilities, etc.). At endline the most common types of PHH practices used are drying (90 percent of farmers use, with host farmers more likely to use), sorting and grading (58 percent) and bagging and weighing (55 percent, with host farmers more likely to use). PHH technology includes use of silos, hermetic bags, traditional bags, storage pest management, tarp, grain sieve, etc. At endline the most common PHH technology methods used are traditional storage bags (85 percent, with host farmers more likely to use) followed by use of a tarp (26 percent). Host community farmers are significantly more likely to use PHH practices and technology compared to refugee farmers. Among refugee farmers those living in Uganda for at least one to two years are most likely to use PHH practices at endline. At baseline men were significantly more likely than women and farmers in Moyo compared to Yumbe, to use PHH practices and technology; however, these differences disappear at endline.

While the pilot's systems approach to the promotion of climate smart seeds helped mitigate some climate change challenges, with farmers acknowledging higher yields from improved seed varieties despite extreme weather conditions such as drought, the challenges remain formidable, with many remaining barriers to awareness, uptake and access to longer-term climate smart approaches. Future programmes would need to address these challenges holistically through targeted interventions and a more mainstreamed approach to climate smart agricultural approaches and technologies.

The pilot farmers suffered from poor quality land, highlighting the importance of identifying appropriate land and facilitating adequate preparation. Whilst generally the land allocation process organised by OPM via negotiations with host landlords worked well in West Nile, challenges arose with the quality and suitability of the land for agricultural activities. The most commonly cited challenges by refugee farmers engaged by the pilot, were flood risk, rocky soil that was hard to prepare, limited road access to land (limiting tractor access), densely forested land, and more commonly deforested land with large and hard to remove stumps. All of these created additional challenges for land preparation for both farmers as well as for tractor service providers, who risked damaging their machinery and equipment when ploughing un-cleared land. This was a key reason refugee farmers in Moyo District requested access to ox-tillage services over tractor services. One tractor service provider in Yumbe District offered to conduct land clearing demonstrations with farmers to educate them on the appropriate time for stump removal, tools and techniques required. He offered to do so at no additional cost if the pilot was able to provide a discount to refugee farmers to purchase tools to clear their plots. While not feasible under the pilot, this is one example of an arrangement whereby market actors are working with farmers to identify solutions to challenges affecting growth of the sector such as land clearance.



Burning trees and brush to make cattle pens is commonplace in West Nile, a region of Uganda experiencing rapid deforestation as a result of the influx of over a million South Sudanese refugees. Farmers engaged by the pilot expressed concerns about the management and scarcity of critical natural resources.

Photo credit: Ezra Millestein

Farmers engaged by the pilot expressed concerns about management and scarcity of critical natural resources. At endline, 40 percent of farmers cited land access and other various environmental challenges as key challenges. While refugee farmers under the pilot were trained in climate smart agronomy practices, partners recognised that this was insufficient to address the mounting environmental factors impacting farmers ability in the region to earn a sustainable income from production. Additionally, when asked about key barriers to agricultural success, at endline lack of land was cited more frequently among refugees (65 percent) compared to host community (17 percent) farmers.²⁹ This may have to do with land quality or size - average size of refugee land is about one acre which is too small for large-

²⁹ Inadequate rainfall was cited most frequently, though more commonly by host community (94 percent) compared to refugee (89 percent) farmers.

scale commercial agriculture.³⁰ Given the limited resources and widespread poverty among both refugees and host communities, it is not surprising that some host community farmers expressed resource concerns and frustrations with the relocation of refugees surrounding their communities. As projects like the pilot seek to catalyse commercial agricultural production, considerations around availability of water for production, land quality and size, and environmental protection techniques, such as agroforestry and the use of organic principles, should be made.

The pilot demonstrated that utilising a climate smart approach should be basic necessity of any agribusiness programme with smallholder farmers in the region. Though farmers used improved inputs and had increased access to more modern tillage practices, poor land quality, limited rainfall and various environmental and resource challenges remained very commonly cited constraints. Though such external constraints went beyond the scope of the project, the prominence of them suggests the effectiveness of future programming may benefit from additional consideration (and potentially programming) to help mitigate these challenges.

Early market systems change - signs around inputs (increasing tillage access, uptake of improved inputs and practices)

Whilst some larger commercial agriculture companies have considered West Nile as a region with market potential, few have invested substantially, citing poor infrastructure, low production volumes and in some cases, poor quality of produce, as major barriers. Similarly, with few agro-dealers and agro-agents active in the region, it has been difficult for companies to reach individual farmers, who are dispersed across large geographical areas and rely on NGOs for access to services. Thus far, NGOs have filled a critical gap in linking refugee and host communities to agricultural services and service providers, either using their own resources to deliver activities directly (such as via trainings), or to distribute products and services on behalf of companies (such as seeds). Whilst NGOs have to an extent supported increased access to inputs and services for farmers, they have not alleviated infrastructural challenges, nor strengthened the supporting market systems. The pilot sought to address these challenges through engagement in the following activities: (1) increasing farmer access to improved seeds and other inputs via markets; (2) encouraging and incentivising farmer uptake of improved seeds and agronomic practices through the use of partial subsidies; (3) understanding and identifying market opportunities appropriate for farmers; and, (4) addressing key constraints such as transportation and distribution.

The pilot demonstrated mixed evidence regarding increasing agricultural income but signs of increased market engagement. Among farmers who had sold any produce in the previous year, median agricultural income³¹ was \$175 PPP (\$70-359 IQR, n=235) among farmers at endline. At baseline, median agricultural income among farmers who had sold produce was \$383 (\$578=mean, \$135-721 IQR, n=51). Host farmers consistently reported higher agricultural incomes compared to refugees, while time spent in Uganda was associated with higher agricultural incomes among refugees at baseline. Men reported higher incomes

³⁰ Beyond their 30 x 30 metre plots, refugees were also to receive 50 x 50 metres to farm. However, allocation of agricultural plots was slow, and refugees also cited far distances from their home and challenges related to host cattle grazing that ruined their crops.

³¹ Agricultural income only includes produce and/or processed crops for sale. It excludes income from livestock and agricultural (wage) labour. Agricultural income collected via farmer recall of income from previous two seasons in UGX. Income data was cleaned for outliers, replacing values greater than three standard deviations from the mean as missing resulting in two missing values each at baseline and endline. Resulting incomes were converted to 2017 \$PPP using a GDP deflator and PPP conversion factor from <http://www.imf.org>. Note that farmers who reported no income were treated as missing, thus the average income is restricted to only those farmers who reported income in at least one season during the previous two seasons.

than women at baseline, although there were no gender gaps among farmers at endline. Finally, farmers in Moyo reported higher earnings than those in Yumbe at endline. This may be because Moyo had more active agro dealers as well as better agricultural land, though was more disconnected in terms of access to markets at the time of the pilot. However, qualitative interviews indicated farmers felt they had increased their agricultural incomes over the past year.



Joyce Ajonye, 35, harvests sesame in Palorinya Settlement. She fled the conflict in South Sudan with her 6 children, arriving in Uganda in February 2017 after walking four days. She contributed 5,000 Ugandan shillings (1.06 GBP) for the purchase of 2kg of improved sesame seeds.

Photo credit: Ezra Millstein

Market sales participation increased from 15 percent among farmers at baseline to over 50 percent among farmers at endline, with market participation associated with higher agricultural incomes at both periods surveyed. Thus, the mixed evidence regarding increases to agricultural income, may be driven by the finding that more farmers engaged in markets at endline but that they sold in small volumes, relative to fewer farmers selling larger volumes at baseline. Host community farmers (54 percent) were more likely than refugee farmers (43 percent) to have sold produce in the previous season but no other differences were found between subgroups.³² At baseline farmers in Yumbe (21 percent) were more likely to sell produce than farmers in Moyo (11 percent) and hosts (19 percent) were more likely than refugees (4 percent) to sell produce.

The pilot farmers cited improved access to inputs, including improved seeds.

At endline 41 percent of farmers reported an improvement in their ability to access inputs (seeds, fertiliser, etc.) from the previous growing season, with refugees significantly more likely to report an improvement (49 percent) compared to

host community farmers (36 percent). At baseline 47 percent of farmers reported an improvement in access to inputs from the prior season, with host community farmers, farmers in Moyo and men more likely to report an improvement than refugees, farmers in Yumbe and women, respectively. Among farmers in Moyo, who previously had to travel to Yumbe to access seeds, improved access may be due to the opening of Uмба (a Moyo based agro-dealer that opened an outlet in Palorinya after seeing opportunities for increased sales to

Market sales participation increased from 15 percent among farmers at baseline to over 50 percent among farmers at endline

³² Survey question asked: “Have you sold any of your agricultural produce during last harvest season [June-July 2018]?” It is not clear whether this includes a single large sale at the end of the season or multiple small sales throughout the season. The question is not restricted to pilot off-takers and includes all sales channels (other households, local trader at farmgate, local trader / market vendor, regional traders, other).

refugees through the pilot). At endline, 53 percent of farmers knew where to find the agro-dealer they purchased seeds from previously, with no significant difference among refugee and host community farmers. One agro-dealer in Yumbe said, “Because at first, we started with just some few seeds, like onion, beans then cabbage. These were the only things that we started with small small. But now we can bring things in bulk and there are many varieties we have brought. It has changed things. People know where Alpha is, what works, they come here, they find its’ a SACCO, that there is mobile money and seeds.” Such improved supply may be the result of the strengthened relationships between agro-dealers and seed companies facilitated by the pilot, as discussed previously.

Increased access is also likely the result of a number of pilot marketing activities.³³ Many farmers specifically referenced the pilot voucher subsidy scheme, as well as seed fairs hosted by NGOs, as the main ways they found out about and accessed improved seeds. Increased access is also likely a result of the agro-agent model used by both agro-dealer companies engaged by the pilot. For both companies the model worked well; knowledgeable agents operated across geographical areas, either adding seeds as a new product line to their existing business or starting a new business as agro-agents.³⁴

At baseline, 30 percent of farmers purchased seed from a local market, 27 percent from an NGO, and 13 percent from an agro-dealer. Purchasing patterns shifted at endline: 48 percent purchased from an agro-dealer, 20 percent from an NGO and just 6 percent from a local market.³⁵ The purchasing shift to agro-dealers was consistent across demographics (men/women, Yumbe/Moyo, refugees/hosts), with the exception of youth farmers (under 25 years), who experienced an increase in rate of purchase from NGOs. However, youth farmers also followed the general shift, with increased purchases from agro-dealers and decreased purchases from local markets. At endline refugees (34 percent) were significantly more likely to purchase seeds from an NGO compared to host community farmers (14 percent); there were no significant differences in

AGRO-DEALERS EXPAND EXTENSION, TRAINING AND DEMONSTRATIONS AVAILABLE TO FARMERS

“They take us for meetings, teach us about seeds, how to plant, actually I used to answer questions asked by farmers. About when their crops are sick. The companies used to come and give us advice.”

- Agro-agent

“I have been teaching them. We had a demo site where we can show them the benefits. It is my own field, but we haven’t put the seeds yet. When we come together we have tea. The field is around one hectare and I want to demarcate it for groundnut, sesame and white sorghum.”

- Agro-agent

“Yes, when they come I help them. Like at first, if you come for seeds I’ll tell you how to plant it, how to weed it, and that they should check the expiry date and that if it is coming to expiry date they shouldn’t buy.”

- Agro-agent

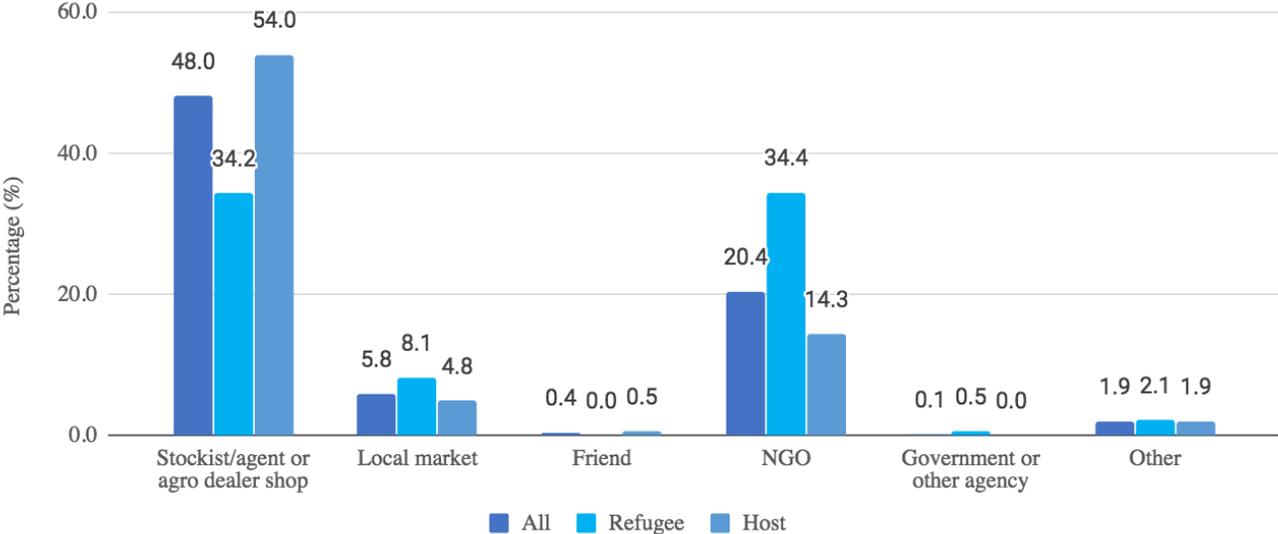
³³ Of these activities, the market days where agro-dealers used vehicles and megaphones to promote new seeds and radio adverts were considered most successful by agro-dealers and agro-agents who reported increased sales following these events.

³⁴ The majority of agro-agents interviewed saw their role as identifying new customers, sharing information, promoting improved seeds, providing farmers with guidance and information on the products they sell, and in some cases using their own land as demonstration plots.

³⁵ This includes seed sales both within and outside the program.

purchase place by gender.³⁶ 42 percent of farmers also knew farmers who purchased improved seeds without a discount, and several farmers cited purchasing additional seeds at full price so that they could plant larger areas of land in qualitative interviews.

FIGURE 4: FARMER SOURCE OF SEED PURCHASE(S)



Based on survey question of who purchased seeds from during the previous two seasons (single response allowed). * p < 0.10, ** p < 0.05, *** p < 0.01 indicates significant difference comparing refugee and host community farmers. No significant difference between men and women.

The pilot indicated farmer willingness and ability to pay full price for improved inputs will take time. Whilst there were early signs of increased uptake of improved seeds during the 12-month pilot, there remain challenges with the high costs and reliance on subsidies by farmers to access them. Only 8 percent of farmers at endline purchased seeds at full market price (3 percent purchased improved seeds, 5 percent purchased traditional varieties) although, as stated above, 42 percent of farmers indicated they knew farmers who purchased improved seeds without a discount. Host community farmers were more likely than refugees to purchase seeds at full price, though there were no differences among sub-populations in regard to improved seeds specifically. One of the agents that worked for Alpha and supported the voucher subsidy scheme for refugees in Bidibidi explained, “...I sell some seeds here but mostly these are the ones with the pilot that we are cost-sharing. The refugees cannot buy this on their own. But when they have voucher they become interested.” Furthermore, the agro-dealer in Moyo cited similar concerns, “I am worried about these seeds that need a lot of money to plant one acre like groundnuts and rice. I’m worried how it will move...”. Farmers shared such concerns and mentioned quality of seeds, timeliness of delivery and price as limitations to purchasing (more) improved seeds.³⁷ One host community farmer group said, “The price is very high. For the quality I think it’s better except the seeds arrived very late last year...” Similarly, one of the agents for Umba

³⁶ At baseline, men were significantly more likely to purchase from an agro-dealer or friend compared to women, while women were more likely than men to purchase from an NGO. Compared to refugees, host community farmers were more likely to purchase from a local market (40 percent versus 5 percent), friend (6 percent versus 2 percent) or government entity (3 percent versus 0 percent), while refugees were more likely to purchase from an NGO (24 versus 17 percent).

³⁷ Farmers have a similarly low willingness and ability to invest in fertilisers. Fertiliser usage is low among farmers (10 percent), Host community farmers (12 percent) are significantly more likely to use fertilizer compared to refugee farmers (5 percent). Commonly cited barriers including cost (30 percent) and lack of knowledge of where to purchase (27 percent). In Palorinya, farmers cited that the only place they could access fertilisers and pesticides was from Moyo town but that the high costs of transport, the products themselves and the equipment (sprayers) meant that they didn’t use them despite understanding the benefits of using them.

Vet said, “We use vouchers. Like last year it was the pilot who bought the seed and at least their discount was a bit fair. But this year the discount is a bit low and people cannot afford seeds.”



Agro-dealer, Pascal, and one of the agro-agents he employs at his shop just outside of Palorinya Settlement. Pascal opened this outlet as a result of the increased sales from refugees he realised under the pilot.

Photo credit: Miji Park

Seed companies engaged by the pilot struggled to meet demand and deliver seeds on time in West Nile. Four of the seed companies interviewed (based in Kampala), all of whom partnered with the pilot said their main customers in the West Nile were NGOs that bought in bulk and to whom they offered discounted prices (due to volume and ability to negotiate). As a result, these companies struggled to fulfil all orders, which were often placed on short notice and resulted in late delivery of seeds.³⁸ Agro-dealers were often the most affected by such practices, as their smaller orders were considered lower priority and often arrived after the bulk deliveries to NGOs. Some seed companies said they saw a shift during the pilot towards more orders being placed by agro-dealers as opposed to NGOs, which they preferred for sustainability reasons. Thus, working with agro-dealers to develop strategies to overcome the identified logistical and financial constraints may help increase timeliness of deliveries.

The pilot raised awareness of improved seed varieties and supported increased uptake of improved varieties. The number of farmers from both host communities and refugee communities using improved seed varieties increased significantly among farmers at endline compared to farmers at baseline. Of the 77 percent of farmers that purchased seeds at baseline (either via a voucher or paying full market price), 43 percent purchased an improved variety. At endline 79 percent of farmers purchased seed (either via a voucher or paying full market price), of which 90 percent purchased an improved variety.³⁹ Agro-dealers engaged by the pilot felt programmes like this and other donor and government interventions were the main cause of the increased demand. In particular, they noted increased demand for vegetable seeds, which they explained farmers were unaware of until recently. Regarding the change in demand, an agro-dealer based in Moyo said “...I think it is because of the interventions of many programmes and the government talking about improved seeds. And then also there has been no organised seed shop in the whole town... But now since the programme they are demanding for grains too. So, sorghum, sesame, maize, ground nuts. I used to sell 50 kg of sorghum every year but now with the activities of the pilot I am selling up to 5 tonnes of sesame, which used not to sell. So that also increased the products that we deal

Some seed companies noted they saw a shift during the pilot towards more orders being placed by agro-dealers as opposed to NGOs, which they preferred for sustainability reasons.

³⁸ 3 percent of farmers cited late delivery of seeds as a primary constraint to making their agricultural activities more successful.

³⁹ Farmers who are landowners more likely to purchase seeds; and, among refugees, those who have been in Uganda at least one to two years are more likely to purchase seeds.

in and also the market size...those promotions have made the shop popular. So, the demand for vegetable seeds and agricultural chemicals has gone up.”

The number of farmers from host and refugee communities using improved seed varieties increased significantly at endline compared to baseline. Out of the 79% at endline that purchased seed, 90% bought improved seeds.

Agro-dealers saw value in marketing activities following engagement with the pilot but sought lower cost strategies to attract and retain customers. Agro-dealers expressed concern with their ability to sustain marketing activities similar to those funded and delivered under the pilot, such as market days where agro-dealers used vehicles and megaphones to

promote improved seeds and radio campaigns. Whilst agro-dealers saw the benefit and demonstrated a willingness to invest in marketing activities, they also recognised the need to identify lower cost options. Three marketing methods that both agro-dealers adopted based on their perceived success of the marketing activities under the pilot, as well as positive feedback from customers, included: (1) collection of customer contact information in a database; (2) use of SMS as a means to communicate with their customers, and; (3) use of megaphones to promote products and services at market days.

“One of the things I have learnt and want to keep is promotions. Under the pilot we had radio adverts and when we started the adverts of course I kept getting calls and then some of the customers came and told me they heard over radio. So, I think the radio advert is working. And also, we have SMS, sending messages to the farmers. Also, the feedback I get is that the farmers like it. The cost is a bit high but it’s something I’ll consider keeping.”

— Agro-dealer

Seed subsidies offered under the pilot facilitated broader accessibility and increased demand for tillage services, but cost remains a long-term limitation to uptake among both farmers and providers.

As part of the pilot, Mercy Corps and Palladium worked with 10 ox-plough providers and three tractor service providers (two in Moyo and one in Yumbe) to raise farmers’ awareness regarding the value of early land preparation as opposed to the more traditional method of waiting for the rains. The pilot used a subsidised model and incentivised farmers through a subsidy scheme, which paid 40-50 percent⁴⁰ and 60 percent of the total market cost for host communities and refugees, respectively. Both tractor and ox-plough service providers reported increased demand for their services with the pilot, though that demand was also high for their services prior to their engagement with the pilot. All providers said the vouchers enabled them to expand their customer base and begin to work with refugee farmers who, they explained, had previously not been able to afford their services. While it is too soon to determine whether farmers will pay full price for these services, qualitative interviews suggested that both refugee and host community farmers were willing and understood the benefits of tillage services but saw price as the remaining major constraint.

⁴⁰ 50 percent for the first season and 40 percent for the second season for host communities.

Many farmers from both host and refugee communities complained the services were not readily available and had either moved to new areas or were fully-booked by the time farmers had sufficient funds to purchase the service. All service providers demonstrated a willingness to increase the number of oxen (and ploughs) or tractors they had, but cited funding as their major barrier (see Section 4 for further information on Capital and Financing). Most lacked adequate capital to access a formal loan or knowledge about where and how to access financial services. The tractor service providers explained, “Actually, that’s where we need support - through a grant or soft loan. Tractors are so expensive...we don’t have capital – we definitely can’t buy out of the little we have made so far. We are looking at options.”

A related demand issue was the quality of the tillage service providers. Several farmers noted the quality of ox-plough service providers was low. Tillage demand may be more effectively served through increased awareness of additional land preparation techniques, as well as modernisation of often outdated equipment (such as wooden yokes instead of leather).⁴¹ One ox-plough provider in Palorinya said “I’ve noticed that in other Districts people are using oxen for ploughing and planting and weeding but here people are just doing the first-plough.” Increased knowledge among service providers, regarding appropriate techniques may enhance the value of their services to customers.

Agent network models developed under the pilot helped to expand access to inputs but it was unclear whether purchasing patterns were long term. Both agro-dealers supported by the pilot used agent models within their businesses prior to the pilot but these models were limited. Under the pilot, 21 input agents were established who provided access to improved seeds to farmers who had not previously been able to access them (due to lack of availability and distance from the nearest vendor). The agreement made between the pilot and the agro-dealers was based on cost-sharing activities including: establishing outlets, providing training to agents and access to products (stock). The agro-dealers were then responsible for payments to agents, either on a retainer or commission-based model. Whilst this model showed demonstrable results in terms of increased sales, they were mainly the result of the subsidy scheme and it is too early to determine whether farmers will continue to use agro-agents to access inputs.

› FARMERS SAW THE BENEFITS OF TILLAGE SERVICES BUT CITED EXPENSE AS A LIMITATION

“The demand is increasing every year. Those days people ploughed using hands but it was shallow and the topsoil has been exhausted and it’s no longer fertile. But because ox-plough digs deeper it brings up the soil that is more fertile and especially when it rains. So, the soil has become so fertile people are demanding ox-plough.”
— Ox-plough provider

“The challenge has been using ox-ploughs and hands because the number of tractors is limited. There aren’t enough, and it was also a little bit expensive compared to other previous services given to them. Inflation has come...They are saying if the market is available and the price is guaranteed they would use tractor.”
— Host community farmer

⁴¹ Usage is low with 41 percent of farmers using ox-plough and less than 10 percent a tractor. Host community farmers (53 percent) are significantly more likely than refugee farmers (11 percent) to use ox-ploughing.

Agro dealers reported several positive signs of an emerging input market for refugees. One partner agro dealer from Moyo noted that as a result of increased demand for project- supported seeds, he also noticed an increase in demand for non-project supported vegetable seeds and chemicals.

Several issues were raised that, if addressed, could strengthen the agent network model further: (1) provision of additional training on technical knowledge of the product and business training, especially to help agents convey the value and cost benefits of improved seeds over home-saved seeds; (2) a more incentivised payment model for agents to reward them for sales and encourage them to stay with the agro-dealers (losing knowledge from one season to the next is costly but common), and; (3) develop more permanent outlet structures for agro-agents to both improve storage facilities and help farmers understand where they can be found. Among the 10 percent of farmers at endline (60 percent at baseline)⁴² that did not access seeds, a lack of awareness on where to buy them and cost were the most commonly mentioned barriers.

Additionally, when asked whether a farmer could re-find the agro-dealer they purchased seeds from, only 53 percent could. Women (49 percent) were less likely than men (58 percent) to re-find them, which may be because agro-dealers' base locations were far from the settlements. Similarly, farmers in Yumbe (47 percent) were less likely to find them compared to Moyo (58 percent), which is likely to be due to the higher turnover of agents in Yumbe. Given this, supporting agro-dealers to formalise and expand the agro-agent model may help to ensure reliable access to products for existing customers and increase uptake among new customers, as well as help farmers to understand locations where they can obtain improved seeds, and/or mechanisms to help farmers re-find agro-dealers they have previously purchased from.

The pilot evaluation highlighted a gap in market-driven extension services that are tailored to local context. Agro-dealers (49 percent) and NGOs (39 percent) were the most common places farmers obtained information on farming practices and inputs, with host community farmers (43 percent) more likely than refugee farmers (31 percent) to obtain information from agro-dealers, while the inverse was true of NGOs (68 percent of refugees compared to 41 percent of host farmers). This is likely because government extension services are limited, reported as a source by only 15 percent of farmers (just 2 percent of refugees and 20 percent of host community farmers). As a result, many NGOs and programmes bring in additional extension workers to fill the need. However, the contracts for these workers only remain viable for the length of the programme. A second challenge is the need to increase coordination with government extension officers. Often extension services offered by NGO programmes increase demand, but government extension services are not able to meet the demand without NGO support.

Private sector market actors engaged by the pilot showed an interest in providing agricultural extension services, though the opportunity remained untested. There was a willingness from agro-dealers, seed companies and offtake companies engaged by the pilot to provide informal extension services

⁴² At endline 11 percent of refugee farmers and 9 percent of host community farmers did not access seeds, which is not significantly different; there are no significant gender discrepancies either with 7 percent of men lacking access compared to 12 percent of women. However, at baseline, significantly more refugees did not have access to seeds (70 percent) compared to host community farmers (55 percent); 68 percent of female farmers did not have access compared to 51 percent of men, with a consistent discrepancy in access among the host community and refugee subpopulations as well, indicating a significant gender discrepancy in access.

through their agro-agents based on recognition that this could help strengthen relationships with farmers and increase the likelihood of them buying their products and services in the future. However, there was no evidence of companies successfully embedding this approach into their business despite being pushed by pilot partners to do so. Given the limited and financially unsustainable nature of many of the extension services available at the time of the pilot, supporting private sector actors to develop such models may be a more financially sustainable approach. One seed company referenced using NGOs as part of their strategy to

bridge the gap between themselves, agro-dealers and farmers to build relationships so that they could eventually work directly with farmers. Others had looked to NGOs to use cost-sharing models similar to those used under the pilot. Whilst a cost-share model may help to stimulate roll-out and uptake, as with any form of subsidy, it should be used with caution. NGOs may provide more benefit by focusing their role in facilitating these relationships and building capacity of market actors rather than providing the services directly.

Farmers engaged by the pilot showed a significant reliance on informal sources for market information which raises questions regarding accuracy of information.

Farmers received information about market prices primarily from agro-dealers, traders and family/friends (30 percent each). Host community farmers (32 percent / 33 percent / 36 percent) were more likely to obtain information from agro-dealers, traders and friends/family, respectively, compared to refugee farmers (24 percent / 20 percent / 10 percent). Refugees were most likely to obtain market information from NGOs (38 percent report), while host community farmers were most likely to obtain market information from friends/family (36 percent). Interestingly at endline both men (31 percent) and women (28 percent) reported agro-dealers as a primary source of market price information. At endline, host community men (33 percent) reported agro-dealers more commonly than refugee men (22 percent), while there were no significant differences among host community and refugee women. Women also commonly obtained market information from traders (31 percent), with host community women (38 percent) more likely than refugee women (18 percent). Finally, men also commonly obtained market information from host community family/friends (34 percent). The prominence of friends/family as the primary source of market information among host community farmers raises concerns around the consistency and quality of information available to these farmers. Additionally, the predominance

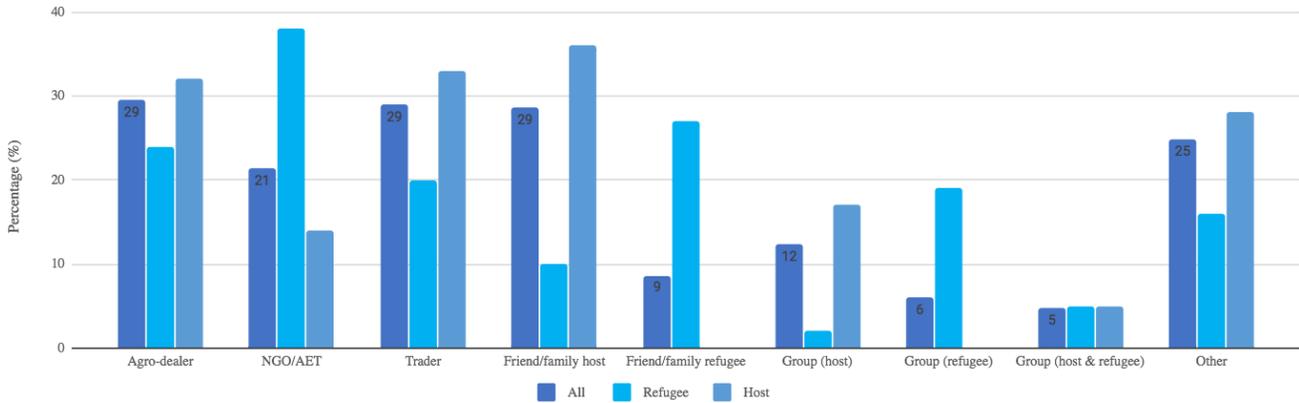


Mercy Corps' agricultural extension trainers visited farms on a weekly basis to fill the training and support gap for refugees as the project worked to encourage agro dealers toward embedding such services in their business offerings. While partners showed a willingness to embed these services in the future, the time frame of the pilot was too short to show any clear results in this area.

Photo credit: Grace Becton

of NGOs as a primary source of information for refugees raises the question of whether NGOs have inserted themselves too heavily in the market, as market host actors, rather than identify and promote market-based avenues.

FIGURE 4: FARMER SOURCE OF MARKET PRICE INFORMATION



Based on survey question of where farmer obtains market price info (multiple responses allowed); * p < 0.10, ** p < 0.05, *** p < 0.01 indicates significant difference comparing refugee and host community farmers.

The pilot efforts to build capacity of agro-dealers to engage with seed companies, bulk orders and negotiate prices based on volume helped to overcome some of the pricing challenges related to poor infrastructure. Substantial infrastructural challenges in West Nile, including poor roads, remote locations and long distances resulted in high transportation costs and distribution challenges for farmers, agro-dealers/agents and offtakers. All Kampala-based seed companies cited geographic challenges with serving agro-dealers in West Nile, who were widely dispersed and often placed small orders, which equated to additional transportation costs. Seed companies offered three delivery options at the time of the pilot: (1) collection by the agro-dealers from the seed company warehouses; (2) local transport, or; (3) delivery organised by the seed company at an additional cost. While NGOs commonly collected seeds directly using large trucks, smaller agro-dealers did not, citing a lack of financial resources required to arrange such a collection. To overcome these challenges, some agro-dealers supported by the pilot began combining individual orders to place bulk orders. Seed companies expressed desire to work directly with agro-dealers, rather than through NGOs, so such a strategy may benefit all parties. Time will indicate the success of this approach.

Distribution was also a challenge for agro-dealers, given high local transport costs in the West Nile region combined with the finding that agro-dealers often did not have their own transport. Both agro-dealers engaged by the pilot used an agent model to distribute their products (as was outlined above), to help address this challenge. However, agents said better access to local transport options would improve their performance. While not a focus for the pilot, ideas to overcome this issue included: (1) supporting agro-dealers to find means to buy transport solutions, and/or; (2) supporting local businesses to offer distribution services to agro-dealers, using bicycles and other common modes of transport.

High transportation costs for seed delivery to West Nile was cited by seed companies as a barrier. To overcome this, some agro dealers supported by the pilot began combining individual orders to place bulk orders.

Offtakers also faced challenges around the high-costs of aggregation. The high number of small volume produce collections was deemed cost-ineffective and often forced prices too low to make it financially viable for either farmers or offtakers. Similar solutions to those raised above could be applied to the aggregation challenges faced by offtakers. Though unknown whether the offtake market is the most appropriate sales channel for farmers, one way to bridge the gap between offtakers reluctance to invest in West Nile and farmers small production volumes would be to identify local private sector actors to establish aggregation centres as well as solutions to the transportation limitations. One company planned to conduct pilots in this space - creating the equivalent of Uber for produce.

While there were positive signs that farmers had improved access to inputs, and there was a willingness from farmers to learn new skills and utilise improved inputs, there remain systemic challenges relating to high costs, weak distribution channels and limited availability of public and private sector service providers. Strengthening the systems behind each of these areas is a critical next step but requires longer time horizons to see impact.

Capital and financing - financing for commercial change

While addressing constraints to capital and financing were not core components of the pilot, findings from the endline evaluation highlighted the critical role of access to finance as it related to enabling farmers to access land, improve inputs, and land preparation services, which theoretically, help to increase quality, yield and ultimately income. The pilot was the first project in the West Nile region to use partial subsidy models to incentivise uptake. This section examines the successes of using partial subsidies in place of full subsidies (which are more commonplace, especially in humanitarian contexts like West Nile), as well as the challenges of introducing these models in such contexts. The evaluation highlighted the importance of applying longer-term thinking from the outset to enable organisations to adapt models and reduce subsidies over time. Given lack of access to finance/credit was a constraint cited by 57 percent farmers at endline, there is a need to look at what financial products or services (trade finance, agriculture-sector loans, VSLAs and savings groups) could be made available to farmers that specifically focus on agriculture. This is an area that was not included under the pilot but should be a prioritised area for future research and programming. Overall, more rigorous assessment of the financial landscape is advised going forward to identify more market-led solutions tailored to farmers' needs.

The pilot was the first intervention in West Nile to use partial subsidy models to incentivise uptake among refugees.

The pilot farmers cited purchasing of tools or inputs for agriculture as a top reason for borrowing. The most common reasons for borrowing included education (46 percent), food (34 percent), medical bills (29 percent), tools or inputs for agriculture (19 percent) and investing in non-agricultural business (17 percent). Host

community farmers (50 percent) were significantly more likely to borrow for educational purposes compared to refugees (28 percent), but there were no significant differences among hosts and refugees in borrowing for any other category.⁴³ However, given inadequate capital was cited as a top barrier to agricultural success and that agricultural inputs appeared as a top reason for borrowing as well as preference for aid, it seems that credit supply did not meet demand in this space at the time of the evaluation. Thus, agricultural borrowing is

⁴³ Borrowing categories include: purchase of food items, purchase of tools or inputs (agricultural), investing in non-agricultural businesses, purchase of consumable non-food items, medical bills, education, clothes, shelter construction, water, transportation, alcohol/drugs/tobacco, and other.

an area that warrants further exploration, particularly given the seasonal/cyclical challenges associated with lending to farmers. However, this topic goes beyond the scope of this evaluation.

Subsidies provided by the pilot worked as an incentive within the 12-month pilot but farmer willingness to pay (more) over time remains unknown. The pilot aimed to demonstrate purchasing power of refugees and market opportunities in and around refugee settlements through offering partial subsidy schemes to access seeds and land tillage services and spur growth of the agribusiness sector. Initially pilot partners faced push back from humanitarian agencies operating in the settlements, specifically with regards to the requirement that refugees contribute to acquire inputs (instead of receiving them for free). After two seasons of subsidised seed sales, the pilot demonstrated that refugees do have purchasing power, albeit limited, and see value in using improved seeds as evidenced by redemption of the vouchers. At endline 68 percent of farmers reported receiving subsidised seeds through the voucher scheme, with refugees (74 percent) more likely than hosts (66 percent) to report using a voucher.⁴⁴ On average farmers redeemed three vouchers. Thus, the subsidy model demonstrated success in the sense of increased (short-run) uptake of inputs and services, but also raised some future concerns.



An agro agent in Palorinya Settlement demonstrates the coupon redemption process through his mobile phone. Discounts on seeds were subsidised by project partners directly to agro dealers' mobile money accounts.

Photo credit: Miji Park

First, determining the amount of the subsidy was challenging given limited understanding of refugee purchasing power. If the subsidy was set too high initially, it may be challenging to recover or reverse reliance long-term. Additionally, subsidies may misguide farmers regarding the true market value of products and services. At endline, only 8 percent of farmers purchased seeds at full price (with only 3 percent improved). Furthermore, farmers willingness to pay for a 2 kg packet of sesame or sorghum seeds was 5,000 UGX at baseline and 7,000 UGX at endline, while the full market price for sesame or sorghum is typically 15,000 UGX per kg. While host community farmers were more likely than refugee farmers to pay full price for seeds, there were no subpopulation differences regarding the likelihood of paying market price for an improved variety (3 percent of host community versus 2 percent of refugee farmers). Given the pilot subsidy it is unclear whether farmers were unwilling to pay or could not afford to pay full market price for improved seed varieties. Additionally, the limited timeline of the pilot did not facilitate measurement over time of adoption and increased willingness to pay as a result of improved performance. The majority of farmers said they would use improved seeds going forward, but almost all farmers felt that they would not be able to pay the full price. Realistically, farmers will need continued support to afford improved seeds and implementers and businesses will need longer time frames to convince/show farmers of the benefits of such varieties. Closer examination of agro-dealer sales

⁴⁴ Note that in reality 100 percent of farmers in the sample purchased seeds using a voucher, so almost one-third are unaware they actually received any discount. At baseline, 55 percent of farmers reported using a voucher, with refugees (80 percent) more likely than host community farmers (46 percent) to report using a voucher.

records over a sustained period of time would help inform how willingness to pay and market prices do or do not align.

The pilot built evidence and understanding for aid actors on how subsidies affect long-term uptake of products and services. Vouchers and other subsidy models can be useful tools for triggering market uptake of products and services. They can also serve as a safety net for vulnerable groups, or those recovering from a shock. Each of these purposes are valid for different segments of West Nile refugee populations. Under the pilot, farmers were given a limited number of vouchers by seed type. Many farmers reported that the amount of seeds they were able to access was not sufficient for the size of land they wished to plant on, and further, that if they had been able to access more seeds at a subsidised price, they would have planted more. This finding may indicate that farmers were not willing to purchase seeds at full price but were willing to purchase multiple subsidised packs. Seed companies expressed concern regarding subsidy models used by NGOs in West Nile, especially those that were fully subsidised (free), as they felt the models created sustainability challenges. In fact, this concern was cited by all seed companies as the primary barrier to investing more readily in the region. To better understand if the pilot's limited discounts helped to trigger a longer-run market for improved seeds, it is important to track agro-dealer sales of unsubsidised seeds in future seasons.

Seed companies expressed concern regarding subsidy models used by NGOs in West Nile, especially those that were fully subsidised (free), as they felt the models created sustainability challenges. This concern was cited by all seed companies as the primary barrier to investing more readily in the region

The pilot highlighted a concern that competing approaches used by aid actors may result in market distortions. 29 and 49 percent of farmers received free seed from NGOs at baseline and endline, respectively. Expectation of free seeds may have influenced farmers willingness to pay for seeds such as those offered with partial subsidy by the pilot. Farmers engaged by the pilot said that free seeds often ended up being sold in local markets, either because the amounts given were too small (intended for farming on the 30x30 meter plots) or because farmers preferred the cash from selling the seeds rather than the seeds themselves. At endline one-third of farmers indicated they did not plant all of the seed they obtained, with not having enough land to plant on, receiving the seeds too late in the season to plant, and drought/climatic issues the most commonly reported reasons. During qualitative interviews, almost all farmers said they were aware of free seeds ending up for resale in the market. Agro-dealers also noted that the prices offered in the local markets undercut the prices they were able to sell at. While virtually nobody (0.1 percent) reported selling pilot seeds - and this number may be underreported - it may also be due to the fact that all the farmers surveyed were required to pay for their seeds (albeit at a discounted price), rather than receiving them completely for free.⁴⁵

⁴⁵ Among those that reported using a voucher to purchase seed, the figure is slightly higher at about 4.7 percent. Again, nobody reported selling the seed they did not plant.

THE CASE FOR PRIVATE SECTOR LED MODELS TO GUARANTEE OFFTAKE AND PRE-FINANCE INPUTS

Several seed and offtake companies started to test models in the West Nile region that guaranteed offtake, and in some cases, pre-finance agricultural inputs. These companies noted that rice, sesame, cotton, and white sorghum, or sila, (if the right variety of seeds are used) had the greatest potential in the region, with some buyers preferring the varieties from West Nile over those from other regions.

One agro-input and offtake company secured a significant contract with one of the largest breweries in Uganda to provide them with white sorghum (sila), a special variety used for brewing. The brewery had demand for up to 15,000 metric tonnes of sila per year, but the offtake company only provided 8-10,000 metric tonnes at the time of the interview. Through increased engagement in West Nile and further training to farmers about sila production⁴⁶ and harvest, as well as provision of seeds, the offtake company hoped to meet sila demand and potentially increase sales and contract volumes with the brewery. The company also planned to ask the brewery to provide the seeds to demonstrate their own commitment to this model.

A second seed company gave free samples of upland rice distributed through agro-dealers. They trained agro-dealers and gave them 250g sample packs to distribute to farmers. The model was first tested in Gulu where they gave sample packs, charged at a token amount of 1,000 UGX and carried out awareness raising activities. They later saw improvements in sales of upland rice in the Gulu region.

Strengthening these models and extending them to incentivise farmers to use the same offtakers repeatedly through loyalty schemes could improve quality, increase volumes and reduce the risk of investment on both sides.

Diversifying crops to meet market demand and drive higher-value: In order to strengthen these models further, companies were exploring crop diversification to higher-value crops as a way to exploit niche markets they saw as increasing in popularity. One agro-input and offtake company in West Nile piloted a model in which they gave farmers chia seeds, agronomic training and a guarantee to purchase the produce at harvest. At harvest they deducted the cost of seeds from the end value of the produce. Results are forthcoming but if successful this model could be replicated by other seed companies.

Offtakers using a social enterprise model recognised that working with higher-value crops could be one way to absorb the higher operational and transport costs while increasing farmer incomes. One company, Tru Trade was exploring fair trade and organic opportunities, citing a premium of up to 20 percent higher for organic produce. One key consideration, however, is that while the higher market value would support increased incomes for farmers, there are stringent quality assurance and supply-chain requirements.

Private service providers engaged through the pilot faced credit constraints which hampered their ability to expand the customer base they could serve. Tractor and ox-plough service providers expressed interest in increasing the number of tractors or oxen (and ploughs) they owned to better meet demand, but

⁴⁶ There is potential cultural sensitivity in Muslim areas with production of a crop used to make alcohol.

cited lack of capital as the major constraint. Two tractor companies in Moyo were considering a partnership at the time of the endline evaluation to maximise market opportunity while sharing the risk and costs of acquiring a new tractor; however, they cited lack of capital as the main barrier to accessing a loan. Similarly, some seed companies expressed interest in hosting demonstration plots but cited high costs and lack of available capital as a key constraints. The extent to which these companies genuinely lack capital was not explored, nor to what extent the companies saw this as something NGOs would support them in and thus were reluctant to take on the investment risk themselves.

Access to sufficient capital as well as appropriate financing schemes to help both agro-dealers and agents as well as farmers came out as a key limitation to the success and sustainability of a market-based intervention. In similar contexts agri-insurance is an option available to farmers. However, in West Nile, attempts to pilot agri-insurance have failed due to the severe impact of climate change on farm losses. While some private actors saw opportunity and were beginning to respond to farmers' demand for inputs on credit, their own capital limitations were a primary impediment to commercial growth at both the farmer and agro-dealer levels.

Long-term market development - Facilitating transition from pilot to scale

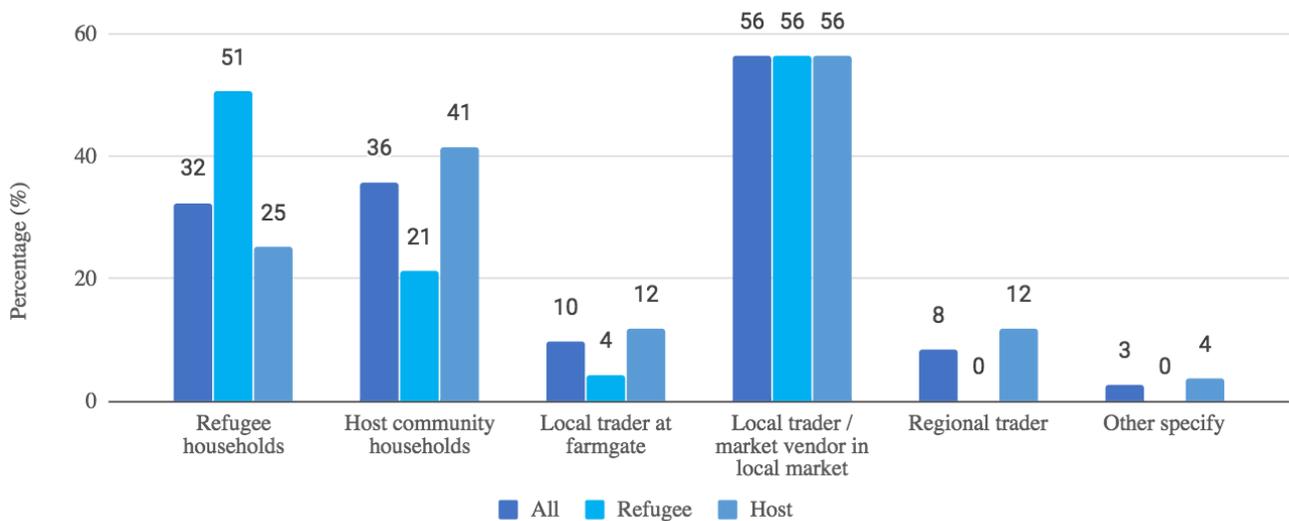
The evaluation provided evidence of behavioural change among market actors all along the agricultural value chain - from farmers, to seed companies and agro-dealers - as a result of the pilot activities, with little indication that these behaviours would revert back at the conclusion of the project. It also provided examples of companies incorporating and mimicking new business practices based on observed successes of activities led through the pilot and there were a number of signs demonstrating the intent of companies to test new models in the future. However, before taking a blended market-based project like the pilot to scale it is important to reflect on key lessons learned, as well as where significant gaps in understanding remain, to help inform future programmes using a similar approach. Thus, this section examines contributing factors to constrained sales and income increases for farmers under the pilot, as well as provides recommendations regarding what additional interventions could support long-term market systems change. The aim is that these learnings from the pilot will allow future projects to be more effectively designed from the onset.

The pilot highlighted gaps in understanding of market dynamics and sales channels with greatest potential for farmers in West Nile. 15 percent and 51 percent of farmers reported selling produce at baseline and endline respectively with a significant difference among refugee and host farmer groups at endline. Farmers surveyed said that the biggest constraints to selling produce at market were unfair prices (cited by 49 percent), lack of a market in a nearby area (48 percent) and lack of packaging and/or transportation of goods to market (42 percent). Among those that sold produce, 56 percent sold to local trader and market vendors in local markets. Other large sales avenues were refugee (32 percent) and host community (36 percent) households.⁴⁷ When asked, two-thirds of farmers that had sold produce said they were planning to sell via the same channel the next season.⁴⁸

⁴⁷ Refugees are more likely to sell to refugee households, while host farmers are more likely to sell to host community households.

⁴⁸ Host farmers (78 percent) were significantly more likely than refugees (43 percent) to plan to pursue the same sales channels.

FIGURE 5: FARMER SALES CHANNELS



Notes - Based on survey question of who sold produce to during previous season. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ indicates significant difference comparing refugee and host community farmers. No significant difference between men and women.

The issue of unfavourable prices is noteworthy, and an area not fully understood by most market actors. Offtakers said they offered farmers competitive prices in relation to those in Kampala market and other agricultural regions in Uganda. However, farmers said prices were higher locally. One seed company noted that the high prices offered by buyers from DRC and South Sudan led farmers to demand higher prices from them but they struggled to be competitive with such buyers given the high transaction costs involved (notably transportation). Many of the pilot’s interventions were designed under the assumption that supporting farmer linkages with larger Kampala based offtake companies would offer the greatest opportunity to farmers. However, the results from the pilot suggested local sales channels may be more profitable for farmers. Local sales channels may also avoid some of the infrastructural challenges that drive up costs for offtakers and force down prices for farmers. Given this discrepancy, an in-depth assessment of potential sales channels, market dynamics, pricing structures, and transaction costs would help to more fully understand the most profitable and sustainable market avenue(s) for farmers.

The pilot showed how building farmers’ capacity to access and use market information could help farmers make business decisions. Many farmers spoke about frustrations with offtake companies who had made promises to come and buy produce from them at harvest, and then failed to come and buy the produce, leaving farmers with large volumes, or offered prices that were lower than other local sales channels. Some farmers were subsequently forced to sell in the local markets which, whilst prices may have been higher, often

took a longer period of time and entailed selling smaller volumes at any one time. Other farmers that sold to local traders supplying DRC and South Sudan reported large profits. Ultimately, farmers need better information about the different sales channels available to them, how to access them and how to ensure they meet quality and demand. During qualitative interviews, almost all farmers noted that guaranteeing an offtake market would be one of the most beneficial forms of support and that they would be more encouraged to make agricultural investments (in higher cost production to get higher yields) if sales were guaranteed. They also suggested that financial products such as agricultural loans would be a helpful mechanism to support this (see Section 2.4 on Capital and Financing).

Beyond market information however, farmers require support to better understand the business of farming. This would include, but is not limited to, understanding the typical yield that can be anticipated from each seed variety, the costs per acre of those seeds, the likely losses (pre and post-harvest), the cost of fertilisers, pesticides and land preparation, as well as the typical market price of each crop. Only with this information are farmers able to make the most informed decisions about what crops to grow and what their best sales avenue will be. While the pilot began to gather some of this information, a prolonged collection approach over two to three years would help to fully develop the business case for farmers and other market actors looking to invest in the West Nile region.

The pilot clearly demonstrated the need for future programming to address cross-cutting constraints such as access to finance, climate change and poor infrastructure. Whilst the pilot covered a number of components critical to driving systemic change within the agricultural sector, there were additional areas outside the scope of the pilot that, if successfully addressed, would support farmers and other market actors in contexts similar to that of the West Nile. Specifically, these include: (1) supporting access to finance interventions, and; (2) identifying and encouraging market-driven solutions to challenges around infrastructure, natural resources and transportation (including distribution and aggregation). Going forward it is important for programmes to either try to address these constraints within their own design, or to work alongside other programmes to ensure that these challenges are addressed in parallel.

The pilot demonstrated early signs of success from using a market systems approach in West Nile but findings from the pilot suggest that going-to-scale will require a multi-year approach. Developing the agribusiness sectors in any context is complex - there are many market actors to coordinate, complexities with agricultural seasons, climatic factors and varying levels and layers of complexity within the agricultural value-chain. It is thus not surprising that the 12-month pilot programme did not achieve full agricultural commercialisation (nor was it the goal) in the West Nile region. What the pilot did do however, is provide a greater understanding of what is possible, raise critical issues about which components of a market-based approach work



well in this context, and where going forward, time and resources should be invested to support further learning on market-based information gathering, change and development.

Largely, to be successful the pilot required behaviour shifts among all actors along the value chain - from farmers, to agro-dealers, seed companies and offtakers. There were signs of such shifts, though understandably they were slow to start and require multi-season learning efforts before positive feedback loops (in the form of successful sales and profits to farmers, agro-dealers and offtakers) develop and persist at scale. While the pilot was successful in increasing knowledge of and access to inputs (land, seeds) and land preparation services to a lesser extent, signs demonstrated a need to explore approaches to help farmers: make additional financial investments in farming, access information to inform what crops to grow, adapt to changing market opportunities, learn more modern production techniques as well as how best adapt to climate change, and find adequate prices and sales channels to sufficiently profit.



Prior to the pilot, agro dealers operated under a different mentality, managing static shops with loyal customers who bought the same goods from one season to the next. After seeing the benefits and being introduced to seed companies and agro-input dealers as part of the project, agro-dealers introduced new products and saw the benefits of marketing their products while also targeting new customers.

Photo credit: Ezra Millstein

Prior to the pilot agro-dealers operated under a different mentality, managing static shops with loyal customers who bought the same goods from one season to the next. However, after seeing the benefits and being introduced to seed companies and agro-input dealers as part of the pilot, agro-dealers introduced new (and often more expensive) products. They also saw the benefits of marketing their products in new ways and targeting potential new customers (refugee farmers) through different strategies, such as using megaphones at market days and radio shows. Going forward, agro-dealers also saw value in providing additional services, such as information and training on agronomic practices. Whilst they have been heavily supported by programmes, including the pilot, there were clear shifts in attitude and mindset regarding how they can reshape their businesses, expand their products and services and use agent-networks to increase their outreach over time. The presence of new agro-dealers within the one-year scope of the pilot was also a positive sign of an expanding market.

Historically the majority of seed companies and offtakers were dissuaded by the poor infrastructure and small volumes of produce within the West Nile. However, they saw sufficient signs of growth to warrant exploration of the capability of the region - initially through human capital to increase their outreach in the region and small-scale pilots of innovative models which, if results are positive, could lead to long-term significant financial and capital investments.

These positive behaviour shifts among actors along the agricultural value chain are indicative of positive systemic change towards full market development. However, the remaining challenges also broadly

emphasise that such development and engagement is complex, takes time and requires a multi-year approach.

Section 3 – Conclusion

This report highlighted the areas of success achieved by the pilot programme whilst simultaneously identifying some of the key challenges, lessons learned, and recommendations for future programming. In general, the pilot demonstrated early signs that a market-based approach could help to generate long-term systemic change regarding development of the agribusiness sector in the West Nile region of Uganda. The early successes are encouraging given a blended market-based approach may be a more effective use of donor funds. The pilot supported market sector actors through a combination of strategies that served to build local capacity and transition the provision of goods, services and information, from NGOs to market actors, as a more sustainable, long-term solution to increase farmers' incomes and resilience.

The pilot revealed that understanding the nuanced dynamics of social capital is a valuable component of a blended MSD approach. Targeted activities under the pilot that focused on building and strengthening relationships between key actors throughout the value-chain (e.g. facilitating refugee land access on host community land) were clearly linked to farmers' increased access to resources, improved efficiencies within the supply-chain and increased knowledge and understanding of farming practices.

The pilot also highlighted how, as projects like this seek to catalyse commercial agricultural production in contexts like West Nile, greater consideration needs to be given to the availability of resources. Sufficient water for production, land quality and size, and environmental protection techniques, such as agroforestry and the use of organic principles, are all vital components to achieving successful yields, particularly with regards to climate change. While consideration for these natural resource factors can be embedded into programme design via climate smart approaches (as the pilot did), further targeted interventions and greater budget allocation is required to truly tackle these formidable challenges.

By endline there were positive signs that farmers had improved access to and demand for improved inputs and tillage services as a result of the pilot, while market actors had improved availability of such inputs and adopted new business practices to encourage farmer uptake. Agro-dealers also responded to farmer desire to learn new skills and expand their knowledge through offering training and extension services. These agro-dealers worked in partnership with seed companies and offtakers and used an agent model to reach farmers, illustrating potential sustained relationships facilitated through pilot activities.



Refugee women in Bidibidi Settlement harvest sesame.

Photo Credit: Ezra Millstein

However, learnings from the pilot clearly indicated that price remained a primary barrier for farmer uptake of improved inputs and tillage services. In fact, limited access to capital as well

as appropriate financing schemes were seen as key constraints to growth of the agribusiness sector by all market actors. Over half of farmers cited lack of credit as a key impediment to the success of their agricultural activities. While access to finance goes beyond the scope of project activities, further research and investment is required in this area.

While the pilot captured a significant amount of valuable market information over the 12-month pilot, gaps in understanding remain related to market potential as well as the most viable and profitable sales channels for West Nile farmers. Furthermore, only time will evidence the true cost benefit to farmers in using improved inputs and services. Capturing this information over multiple years to build the business case for farming could be a powerful tool to engage farmers and leverage buy-in from agro-dealers, seed companies and offtakers, as well as external actors such as government and donors. Whilst the above highlights how market-systems development is a multi-year process, there are also key areas where the donor and NGO community as a whole can start to affect immediate changes to support more market-driven approaches to programming long-term.

A field of white sorghum in Palorinya Settlement, Moyo District, one of the crops promoted by the project and offered at subsidized rates to refugee and host farmers.

Photo Credit: Ezra Millstein



In the shorter-term, NGOs and programmes can facilitate linkages between farmers and market actors to build trust, reduce information asymmetries and fulfil a middleman role in supporting increased accessibility of products and services. Focus can also be placed on helping farmers access information to determine if investments to increase production can increase farmers' incomes, while supporting them to overcome key constraints to make the transition to commercial agriculture (access to land for refugees, inputs, services and market opportunities). More strategically, NGOs can look internally at how to remove themselves from the supply-chain, and instead, work with and through appropriate market actors. For instance, NGOs can work more closely with private sector market actors to take ownership to deliver activities like training, marketing and awareness raising, as well as utilising private sector actors to procure inputs and services. The focus of NGOs can, in turn, be to build the capacity of these market actors to deliver agricultural services, identify commercial models with potential for scale and encourage other actors to enter the market, thereby expanding and growing the agribusiness sector.

In the longer-term, there is need and potential in the region to support a larger-scale, multi-year approach to programmes supporting sustainable growth of the agribusiness sector and agricultural incomes. Such an approach would embed a wider range of cross-cutting themes, such as climate change and access to finance, and allow more time and resources to be allocated to better understanding market dynamics (such as local, informal sales channels that may offer better prices than offtake companies), better align the expectations of

farmers and offtakers, and build an understanding of the most feasible and profitable sales channels for farmers. A multi-year engagement would also allow for an increased focus on addressing infrastructural challenges such as aggregation, transportation and distribution, all of which require long-term investment and buy-in. Most importantly, this would allow farmers to make the transition from subsistence to commercial farming in a way that slowly reduces reliance on NGOs and subsidies over time, allowing farmers (and all actors along the value chain) time to invest sustainably, gain the skills and experience required to be successful, and increase their incomes with the ultimate goal of long-term self-reliance rather than direct assistance.

Section 4 - Annexes

Rationale for evaluation study

Mercy Corps, DCA and Palladium have completed the implementation of a pilot in the West Nile Sub-Region using a market systems approach within the refugee and host communities from July 2017 to July 2018. The main purpose of the pilot evaluation was to review and assess progress and results attained. The evaluation assessed the potential of market systems approaches to operationalise the pilot in both refugee and host communities for UN agencies and NGOs in the West Nile region. The evaluation provides tactical recommendations for evidence-based decision making to inform management, donor agencies, government and other stakeholders on related strategic directions and future implementation.

Research questions

- What changes / outcomes / achievements have taken place?
- How have these changes / outcomes / achievements been brought about?
- How sustainable and scalable are key changes, outcomes and achievements? Examine both in terms of observed market system change as well as individual beneficiaries and potentially indirect beneficiaries.
- How do the changes vary between the target refugee and host communities?
- To what extent have refugees and host communities been directly and indirectly targeted by the program benefited from market systems interventions?
- How do outcomes vary by different sub-sets of refugees (women, youth)? How do they vary by refugees and hosts?
- To what extent does this approach represent good value-for-money (in terms of the 3Es: Economy, Efficiency, Effectiveness as well as the strength of links within the market systems) as compared to more traditional humanitarian and development programming models?
- How much impact on market systems did this intervention achieve relative to the inputs that as agencies invested in (cost effectiveness)?
- To what extent and how has the programme affected people in ways that were not originally intended?

- What factors are driving behaviour change in market system actors, specifically, farmers (beneficiaries and non-beneficiaries), agro-dealers (partners and non-partners), traders, and aid actors?
- How have the interventions influenced actors in the market system to date?
- What role can social capital/social connectedness play in the spread and uptake of interventions?
- How does social capital, and related factors, affect the uptake and differences in access to market benefits? This includes intervention and non-intervention benefits. Are there differences between how host community farmers and refugees use social capital to access market benefits?

General questions

- Why did things go the way they did?
- What do we learn from: both successes and failures from this programme?
- What should be replicated and continued in implementation if a follow-on project is funded? What should be avoided or dropped?
- What changes could be recommended in review, redesign, planning, coordination, implementation and other factors?

Value for Money and efficiency of the project

- Did the programme demonstrate value for money in terms of economics, efficiency and effectiveness during the implementation as compared to traditional delivery of community led development initiatives? What evidence exist to demonstrate this?
- What could consortium partners do differently to improve the cost efficiency in planning and implementation market systems approaches to operationalize the pilot in both refugee and host communities?

Sustainability

- Willingness of private sector actors to maintain behaviours encouraged/facilitated by the programme
- Willingness of private sector actors to maintain presence and business in some of the areas within the settlement
- Willingness of farmers to purchase improved inputs without a subsidy; farmers' show improved agronomic practices in future seasons; farmers show improved market connections; farmers invest in their farms to increase incomes
- Project learnings influence actors to consider different approaches to livelihoods that are more market-oriented
- Readiness of the host and refugee communities to scale-up?
- Extent of existing evidence demonstrating that the benefits delivered by the programme will be sustained after the pilot?

Gender Mainstreaming

- Did the pilot project correctly identify gender-differentiated development opportunities?
- Have women and men had equal opportunities to participate in overall pilot project activities?
- Has the pilot project innovatively mainstreamed gender-equal opportunities and in empowering women?

Climate SMART risk analysis

Did the project correctly identify and institute climate SMART practices? If not, how should this be more effectively included in future programme designs?

Government and Stakeholder engagement

- Who are the project's key stakeholders?
- Has the local government, UNHCR, OPM and national government been involved? How so and how could this be done more effectively?

Challenges/limitations

- What constraints and challenges were encountered in implementing the pilot project?
- What were the biggest success factors and barriers to this approach achieving intended outcomes?
Investigate:
- Capacity/appropriateness for refugee groups (look specifically at access to finance, information land, and technology, all cited as barriers)
- Market context and market actor capacities/incentives
- Market distortions as a result of aid
- Implementation challenges (internal)
- Aid sector challenges (e.g. behaviour and incentives created by aid actors and effects on markets)

Qualitative methods

Sample

47 interviews and/or focus groups were conducted which included host and community farmers, private sector companies (both partners and non-partners), innovation centre partners, refugee welfare committees, OPM, UNHCR and donors and NGOs. The full list of interviews is provided in the table below. Full transcriptions and meeting notes from all meetings are also available.

Table 4.1.3.1: Endline Qualitative Interviews

Date	Person/s	Type	Location	Duration
4.7.2018	Collins Apuoyo, Team Leader, NUTEC	KII	Kampala	1 hr
4.7.2018	Dan Bazira, MEL Lead, MCU	KII	Kampala	30 mins
5.7.2018	Meeting with NUTEC team	Discussion	Arua	90 mins
5.7.2018	Meeting with Keneth Aguret, PM	Discussion	Yumbe	60 mins
6.7.2018	Alpha Stores	KII	Yumbe Town	35 mins
6.7.2018	Tru Trade	KII	Yumbe Town	35 mins
6.7.2018	Amina, Alpha agro-dealer agent (informal)	KII	Yumbe	28 mins
6.7.2018	Zubere, Alpha agro-dealer agent (informal)	KII	Yumbe	29 mins
7.7.2018	Host community farmers	FGD (12 pax)	Yumbe	1 hr 5 mins
7.7.2018	Host community farmers	FGD (25 pax)	Yumbe	57 mins
7.7.2018	Host community farmers	FGD (10pax)	Kochi	50 mins
7.7.2018	Alpha agro-dealer agent (informal)	KII	Kochi	11 mins
9.7.2018	Alpha shopkeeper	KII	Yumbe	25 mins
9.7.2018	Bayo, Raymond tractor services	KII	Leforoyi	35 mins
9.7.2018	Host community farmers (tractor users)	FGD (10 pax)	Leforyi	40 mins
9.7.2018	Umba vets, agro-dealer agent	KII	Leforyi	9 mins
9.7.2018	Host community farmers (tractor users)	FGD (10 pax)	Leforoyi	32 mins
9.7.2018	Raymond and Downtown investments	KII	Moyo Town	40 mins
10.7.2018	Pascale from Umba vets, MD	KII	Moyo Town	41 mins
10.7.2018	Agro-dealer (non-programme partner)	KII	Moyo Town	10 mins
10.7.2018	Refugee community farmers	FGD (6 pax)	Palorinya East	51 mins
10.7.2018	Ox-plough service provider	KII	Palorinya East	26 mins

10.7.2018	Agro-dealer	KII	Palorinya	16 mins
10.7.2018	Refugee community farmers	FGD	Palorinya	55 mins
10.7.2018	Ox-plough service provider	KII	Palorinya	15 mins
10.7.2018	Refugee community farmers	FGD	Palorinya	54 mins
11.7.2018	Refugee community farmers	FGD	Bidibidi Zone 3	44 mins
11.7.2018	Agro-dealer	KII	Bidibidi Zone 3	8 mins
11.7.2018	Agro-dealer	KII	Bidibidi Zone 4	15 mins
11.7.2018	Refugee community farmers	FGD	Bidibidi Zone 4	60 mins
11.7.2018	Refugee welfare committees	KII	Bidibidi Zone 4	20 mins
12.7.2018	FICA, seed company	KII	Yumbe	65 mins
12.7.2018	AFAD	KII	Yumbe	41 mins
12.7.2018	Noah tractor services	KII	Yumbe	13 mins
12.7.2018	Seed fair @ DCA offices	Observation	Yumbe	2 hrs
12.7.2018	UNHCR	KII	Yumbe	45 mins
12.7.2018	Catholic Relief Services	KII	Yumbe	1 hr
12.7.2018	Grace Becton, Team Leader, MCU WNile	KII	Yumbe	1 hr
12.7.2018	Debora Randall, NUTEC M4P Advisor	Skype	Skype	1 hr
13.7.2018	GADC (questions by Miji)	KII	Rhino Camp	1 hr
16.7.2018	Farmers Service	KII	Kampala	1 hr
16.7.2018	Alex Humphrey, MCU	KII	Kampala	1 hr
16.7.2018	East Africa Seeds	KII	Kampala	1 hr
17.7.2018	Mobi Pay	KII	Kampala	1 hr
17.7.2018	NASECO	KII	Kampala	1 hr
17.7.2018	Outbox	KII	Kampala	1 hr

Instruments

The following themes were discussed throughout the fieldwork. Not all themes were covered in each interview/focus group. For all interviews and focus group discussions, the interview guides were used as prompts. However, the structure and format were adjusted to suit the different audiences and to support the flow of the discussion. Translators were used in all focus group discussions and some key informant interviews. Where translators were used, a thorough brief was provided to them to ensure that the information relayed was accurate and that the risk of bias was reduced.

Private sector companies (programme partners)

- Business and market background
- Engagement with the pilot / NUTEC MD
- Wider collaboration and support

Private sector companies (non-programme partners)

- Business and market background
- Awareness of issues affecting refugees and host communities and importance to business model
- Awareness of the pilot / NUTEC MD
- Wider collaboration and support

Innovation centre partners

- Involvement with MC innovation centres
- Description of activities
- Challenges faced
- Sources of support

Host community and refugee farmers

- Farming and community context
- Refugee (or host community) presence / relationship to
- Access to inputs, extension advice, markets
- Social connections to refugees (or host community)
- Involvement with NUTEC MD / Palladium activities
- Feedback on NUTEC MD / Palladium activities
- Changes experienced through programme involvement
- Changes experienced in past year

Refugee welfare committees

- Role and background on refugee welfare committee
- Challenges/limitations of refugees
- Knowledge of the pilot programme
- Impact of the pilot programme among participants
- Improvement of the pilot programme

Donors and NGOs

- Familiarity and collaboration with the pilot
- Key challenges faced by donors/NGOs in region
- Alternative effective livelihood options for refugees
- Barriers to implementing refugee livelihood programmes beyond immediate aid
- Knowledge/awareness of market distortions
- Impact of donor activity on private sector

Limitations

The qualitative fieldwork process went smoothly and we were able to cover a lot of ground in the time available. The significant distances between some locations meant that a lot of time was spent moving from location to location but this also meant we were able to meet with a varied and dispersed group of stakeholders. Occasionally logistical issues such as vehicle availability or limited routing options meant that some interviews had to be postponed or moved around and in one instance we had to ask Miji Park, Director of Programmes to carry out the interview with GADCO as we ran out of time. The use of translators was efficient and whilst it meant interviews were longer due to the need to translate we were able to meet with the necessary beneficiary groups. The availability of private companies was at times limited but we were still able to meet with all major programme partners. We were not able to meet with non-programme partners from the private sector but following the discussions and level of information gathered from programme partners it is not believed that it would have made any major difference to the overall findings. No other limitations were faced.

Quantitative methods

The farmer beneficiary listing was used as the sampling frame. The sample was stratified across Yumbe and Moyo districts as well as refugees and host households. Following stratification, a simple random sampling technique was used to select respondents.

Table 4.1.4.1: Endline Sample

District	Refugee	Host	Total Sample
Yumbe	146	112	258
Moyo	128	104	232
Total	274	216	490

The overall sample size is determined using baseline sample size calculation assumptions:

- N=5,000 (target population size comprised of 1,500 refugees and 3,500 hosts)
- p and q = 0.5
- Z = 1.96 (95 percent CI)
- margin of error = 0.0462 (set slightly lower than the standard 5-10 percent for improved precision given the pilot stage of the project)

Purposively oversampling refugees in both Yumbe and Moyo districts (while undersampling host community members in Moyo) ensures sufficient observations are available to conduct analysis on each of these subgroups. However, given the sample allocation proportions do not match the target population, with some groups over/underrepresented, thus survey weights were used to adjust the analysis.

Household survey instrument (outline of modules)

- General information
- Demographic and household data
- Coping Strategy Index (CSI)
- Income, savings and expenditure
- Crop production system
- Agricultural extension and post-harvest practices
- Harvest, sales and market access
- Social connection
- Humanitarian assistance - food aid
- Humanitarian assistance - cash aid
- Humanitarian assistance - social network support

Variables included in the quantitative analysis

Household welfare and resilience outcomes tested:

- Agricultural income
- Probability of adoption of two or more PHH practices and at least one PHH technology
- Probability of purchase of fertilizer or chemicals in the previous season

Covariates included in regressions:

Farmer characteristics

- Farmer gender
- Farmer age
- Farmer education
- Farmer length of stay in Uganda (refugees only)
- Farmer marital status

Household characteristics

- Household size
- Type of household
- Community member status (refugee or host)
- CSI score or expenditure wealth quintile dummies
- Land access

Other

- Geographic location

Enabling factors tested with outcomes:

Inputs

- Received free seed
- Bought seed
- Bought fertilizer or chemicals
- Reported improvement in agricultural input access

Knowledge / technology

- Household use of PH technology
- Household use of an agricultural mechanization practice
- Household access to extension services

Market access

- Access to market
- Sold produce during past season

Multivariate regression models

Agricultural income

The relationship between enabling factors and agricultural income was assessed using an OLS regression model as follows:

$$N_i = a_0 + a_1 \text{ enabling factor} + a_2 I + a_3 H + \epsilon,$$

where N_i is agricultural income at the household level; the enabling factor is a covariate for inputs, knowledge/technology or market access; I is a vector of individual characteristics; H is a vector of household characteristics; a_1 , a_2 and a_3 are the parameters to be estimated; and ϵ is an error term. N_i takes a log form such that the interpretation of the enabling coefficient is in percentage terms (a one-unit increase in a_1 enabling factor is associated with a $(N_i * 100)$ percent increase/decrease in agricultural income. The key coefficient of interest is a_1 , which captures how the inputs, knowledge/technology or market access are correlated with the household agricultural income outcome, having controlled for a conventional set of observable household and individual characteristics.

Note that the input, knowledge/technology and market access enabling factors were run one at a time in order to assess which has/have the greatest associations with agricultural income. A base model, which excludes all enabling factors, was run as a comparison point. This allows for analysis of which household and individual farmer characteristics have the greatest associations with agricultural income (i.e. more educated, older, host community members, etc.), which is beneficial knowledge for future programme targeting and expansion.

Resilience measures

The relationship between a more restricted set of enabling factors and 1) the probability of adoption of two or more PHH practices and at least one PHH technology; 2) purchase of fertilizers/chemicals in the previous season was assessed using a probit regression model as follows:

$$N_p = a_0 + a_1 \text{ enabling factor} + a_2 I + a_3 H + \epsilon,$$

where N_p is the probability of adoption of a resilience measure (either adoption of PHH practices/technology or purchase of chemicals/fertilizer) at the household level; enabling factor is covariate for inputs, knowledge/technology or market access; I is a vector of individual characteristics; H is a vector of household characteristics; a_1 , a_2 and a_3 are the parameters to be estimated; and ϵ is an error term. The key coefficient of interest is a_1 , which captures how the inputs, knowledge/technology or market access is correlated with the resilience practice, having controlled for a conventional set of observable household and individual characteristics.

The input, knowledge/technology and market access enabling factors were run one at a time in order to assess which have the greatest associations with adoption of resilience measures. A base model which excludes all enabling factors was run as a comparison point. This allowed for analysis of which household and individual farmer characteristics had the greatest associations with adoption of resilience measures (i.e. more educated, older, host community members, etc.), which is beneficial for future programme targeting and expansion.

Accessibility of markets and improved access to inputs

These are enabling factors to 1 and 2 listed above. As such, they were tested as enabling factors (covariates which are associated with the outcomes of interested) in the models described above.

All models were run with both the baseline and endline data to assess consistency of these relationships and/or changes.

Evaluation limitations

The programme did not randomize treatment, as it is a market-based intervention, but rather targeted host community and refugee farmers with a variety of market-based interventions. Thus, the analysis cannot establish direct causality but instead employed a combination of descriptive and multivariate regression analysis methods to understand the relationship between access/use of inputs, knowledge/technology and markets to agricultural income and resilience practices. The analysis also allows for better understanding of how outcomes vary by community member status (i.e. refugee or host), gender, age and other characteristics, to help inform future programme design and targeting. Given these limitations, the quantitative approach relies heavily on support from the qualitative component of the survey.

There is no true baseline for the programme evaluation given the baseline survey (November 2017) was conducted several months after programme implementation (July 2017) had begun. Fortunately, given the delay in terms of planting versus harvest, the baseline data for agricultural income, specifically, is not likely to have been affected by the programme at the time of data collection. However, other outcomes of interest, such as adoption of post-harvest handling practices, access to extension services, markets, etc. may have been affected by the programme by the time of baseline data collection. As a result, the changes from baseline to endline may be less significant or insignificant; furthermore, significant changes cannot be attributed as a direct cause of the programme.

Another limitation is seasonality given that the baseline (November 2017) and endline (July 2018) surveys were conducted in different seasons. While this will likely affect questions with one season recall periods, questions that use a two-season recall will be less affected. A primary outcome of interest is agricultural income, and this fluctuates depending on the season. Income for two seasons is collected for both baseline and endline. However, calendar recall periods (i.e. past three/six months, from the last growing season to this one, etc.) also differ in terms of which months are included. Since the ideal comparable design would require matching calendar timing and recall periods to account for seasonality, the impact of seasonal fluctuation should be kept in mind when assessing results.

Results tables

Table 9.1: Individual and household descriptive statistics

Gender	Baseline			Endline		
	Refugee	Host	All	Refugee	Host	All
Male	39.01**	51.46**	47.73	40.43***	54.93***	49.72
	(32.07-45.95)	(44.80-58.11)	(42.59-52.87)	(34.46-46.40)	(48.01-61.85)	(44.73-54.71)
Female	60.99**	48.54**	52.27	59.57***	45.07***	50.27
	(54.05-67.93)	(41.88-55.20)	(47.12-57.41)	(53.60-65.54)	(38.15-51.99)	(45.29-55.27)
Age						
15-24 years	13.08	15.43	14.73	8.90	8.01	8.33
	(8.13-18.04)	(10.57-20.29)	(11.01-18.44)	(5.30-12.51)	(4.02-12.00)	(5.47-11.19)
25-34 years	31.67	25.43	27.30	27.88***	16.57***	20.63
	(25.03-38.31)	(19.60-31.26)	(22.75-31.84)	(22.39-33.37)	(11.38-21.76)	(16.73-24.53)
35-59 years	47.60	48.14	47.98	56.03	58.75	57.78
	(40.40-54.80)	(41.49-54.80)	(42.84-53.11)	(49.96-62.09)	(51.87-65.64)	(52.85-62.70)
>60 years	7.65	10.99	9.99	7.19***	16.66***	13.26
	(3.73-11.57)	(6.69-15.10)	(6.89-13.10)	(4.06-10.31)	(11.55-21.78)	(9.78-16.74)
Education						
Never attended school	46.10***	28.42***	33.71	17.81	17.64	17.70
	(38.88-53.29)	(22.46-34.38)	(28.93-38.48)	(13.09-22.53)	(12.74-22.53)	(14.13-21.27)
Some primary / completed primary	39.34	47.04	44.74	48.94	50.89	50.19
	(32.31-46.37)	(40.39-53.70)	(39.61-49.87)	(42.86-55.04)	(43.90-57.88)	(45.21-55.18)
Some secondary / completed secondary	13.17	19.00	17.26	28.65	28.38	28.48

	(8.55-17.80)	(13.74-24.26)	(13.31-21.20)	(23.21-34.09)	(21.88-34.88)	(23.88-33.08)
Completed certificate	0.39**	3.22**	2.37	1.44**	2.48**	2.11
	(0.00-1.18)	(0.85-5.57)	(0.70-4.04)	(0.00-2.88)	(0.24-4.72)	(0.58-3.63)
Completed degree	0.61	2.32	1.81	3.15	0.61	1.52
	(0.00-1.80)	(0.30-4.34)	(0.35-3.27)	(1.06-5.24)	(0.00-1.80)	(0.44-2.59)
Marital Status						
Married	76.77***	88.23***	84.80	81.69	82.11	81.96
	(70.44-83.10)	(84.03-92.44)	(81.25-88.36)	(76.98-86.41)	(76.76-87.45)	(78.13-85.78)
Single	2.61*	5.95*	4.95	3.93	4.65	4.39
	(0.30-4.92)	(2.80-9.11)	(2.63-7.27)	(1.49-6.36)	(1.58-7.72)	(2.24-6.54)
Separated / divorced	7.28***	1.66***	3.34	5.48	4.09	4.59
	(3.31-11.24)	(0.04-3.28)	(1.68-5.01)	(2.70-8.25)	(1.34-6.83)	(2.56-6.61)
Widowed	13.34	4.15	6.90	8.90	9.12	9.07
	(8.18-18.51)	(1.61-6.68)	(4.50-9.30)	(5.47-12.34)	(5.22-13.10)	(6.26-11.87)
Time in Uganda						
< 3 months	--	NA	NA	--	NA	NA
3 – 6 months	1.58	NA	NA	--	NA	NA
	(0.03-3.13)					
6 – 12 months	40.61	NA	NA	0.44	NA	NA
	(33.72-47.50)			(0.00-1.31)		
1 – 2 years	57.20	NA	NA	94.41	NA	NA
	(50.22-64.18)			(91.67-97.16)		
3 – 5 years	--	NA	NA	1.33	NA	NA
				(0.00-2.82)		
> 5 years	--	NA	NA	3.54	NA	NA

				(1.42-5.66)		
Household size						
	5.28***	8.05***	7.22	7.61	7.79	7.73
	(4.92-5.64)	(7.56-8.55)	(6.84-7.60)	(7.20-8.01)	(7.32-8.26)	(7.39-8.06)
Household type						
Dual headed	76.77***	88.23***	84.80	82.02	83.75	83.13
	(70.44-83.10)	(84.03-92.45)	(81.25-88.36)	(77.37-86.67)	(78.59-88.92)	(79.42-86.84)
Female headed	19.80	8.42	11.83	15.71	12.26	13.50
	(13.80-25.81)	(4.86-11.99)	(8.70-14.96)	(11.27-20.14)	(7.77-16.76)	(10.21-16.80)
Male headed	3.42	3.34	3.37	2.27	3.98	3.37
	(0.70-6.16)	(0.90-5.78)	(1.47-5.26)	(0.55-3.98)	(1.05-6.92)	(1.38-5.34)
CSI Score	19.60	22.73	21.79	25.24**	20.81**	22.40
	(17.54-21.66)	(19.23-26.24)	(19.25-24.33)	(22.41-28.07)	(17.99-23.62)	(20.32-24.49)
Wealth (\$PPP 2017)	58.84***	368.66***	275.88	141.10***	366.09***	284.19
	(39.30-78.38)	(285.90-451.41)	(216.31-335.45)	(116.73-165.46)	(308.10-424.07)	(244.82-323.57)
Geographic location						
Moyo district	33.28***	70.13***	59.10	35.40***	63.34***	53.31
	(26.95-39.61)	(64.20-76.01)	(54.14-64.05)	(29.95-40.84)	(57.13-69.56)	(48.41-58.19)
Yumbe district	66.72***	29.87***	40.90	64.60***	36.66***	46.69
	(60.38-73.05)	(23.94-35.80)	(35.95-45.86)	(59.16-70.05)	(30.44-42.87)	(41.81-51.58)
Sample (n)	194	219	413	274	216	490

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01 for comparison of subgroups (refugees versus host community farmers, Yumbe versus Moyo, women versus men, under versus over 25 years). Non-overlapping confidence intervals indicate a significant difference between baseline and endline.

Table 9.2: Agricultural income (\$PPP 2017), by subgroup

Group	Baseline Estimate	95% CI	Endline Estimate	95% CI
All farmers	110.37	57.45-163.28	173.41	125.37-221.45
Refugees	1.76***	0.41-3.11	61.90***	31.32-92.48
Hosts	156.79***	81.77-231.82	235.92***	164.02-307.82
Yumbe	131.13	58.92-203.34	125.62*	82.93-168.31
Moyo	96.00	21.80-170.19	215.27*	134.00-296.54
Women	36.10***	14.68-57.52	133.29*	68.88-197.71
Men	191.69***	84.97-298.41	213.98*	142.88-285.07
Under 25	142.80	2.95-282.65	131.58	41.73-221.43
Over 25 years	104.76	47.63-161.90	177.21	125.46-228.96

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01 for comparison of subgroups (refugees versus host community farmers, Yumbe versus Moyo, women versus men, under versus over 25 years). Non-overlapping confidence intervals indicate a significant difference between baseline and endline.

Table 9.3: Percent of farmers using two or more PHH practices and at least one PHH technology, by subgroup

Group	Baseline Estimate	95% CI	Endline Estimate	95% CI
All farmers	51.47	46.34-56.59	53.49	48.53-58.44
Refugees	14.26***	9.81-18.72	44.25***	38.20-50.30
Hosts	67.37***	61.11-73.63	58.66***	51.79-65.54
Yumbe	36.94***	29.38-44.51	49.97	43.79-56.15
Moyo	61.52***	54.80-68.24	56.56	49.06-64.07
Women	46.84**	39.79-53.88	52.51	45.85-59.17
Men	56.54**	49.13-63.95	54.47	47.13-61.81
Under 25	49.33	35.61-63.05	52.64	34.80-70.47
Over 25 years	51.84	46.32-57.36	53.56	48.41-58.72

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01 for comparison of subgroups (refugees versus host community farmers, Yumbe versus Moyo, women versus men, under versus over 25 years). Non-overlapping confidence intervals indicate a significant difference between baseline and endline.

Table 9.4: Percent of farmers with market access for agricultural produce, by subgroup

Group	Baseline Estimate	95% CI	Endline Estimate	95% CI
All farmers	47.56	42.41-52.71	33.5	28.75-38.42
Refugees	38.69***	31.71-45.66	30.86	25.18-36.55
Hosts	51.38***	44.70-58.05	34.97	28.29-41.65
Yumbe	42.72	35.26-50.18	34.43	28.56-40.30
Moyo	50.94	43.93-57.94	32.68	25.41-39.95
Women	43.38*	36.44-50.32	31.87	25.61-38.13
Men	52.18*	44.61-59.75	35.14	28.01-42.27
Under 25	43.67	29.97-57.37	27.63	12.29-42.96
Over 25 years	48.24	42.68-53.79	34.03	29.06-39.00

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ for comparison of subgroups (refugees versus host community farmers, Yumbe versus Moyo, women versus men, under versus over 25 years). Note that construction of the market access indicator differs between baseline and endline which may contribute to the lower results at endline. Non-overlapping confidence intervals indicate a significant difference between baseline and endline.

Table 9.5: Percent of farmers that sold produce in the previous season, by subgroup

Group	Baseline Estimate	95% CI	Endline Estimate	95% CI
All farmers	32.72	27.78-37.65	17.68	13.82-21.53
Refugees	16.1***	11.03-21.17	16.78	12.12-21.44
Hosts	39.76***	33.24-46.29	18.18	12.77-23.59
Yumbe	24.33***	17.60-31.07	19.00	14.14-23.86
Moyo	38.54***	31.69-45.39	16.52	10.69-22.35
Women	26.8**	20.47-33.12	19.72	14.26-25.18
Men	39.23**	31.71-46.75	15.62	10.21-21.03
Under 25	37.68	24.29-51.08	17.93	5.25-30.61
Over 25 years	31.86	26.56-37.15	17.65	13.61-21.69

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ for comparison of subgroups (refugees versus host community farmers, Yumbe versus Moyo, women versus men, under versus over 25 years). Note that depending on endline recall (whether the farmer had harvested for June/July 2018 or not yet at the time of the survey), the baseline and endline season recall may differ. Baseline conducted fall of 2017 so recall for previous season is clearly June/July 2017. Non-overlapping confidence intervals indicate a significant difference between baseline and endline.

Table 9.6: Percent of farmers reporting improved access to agricultural inputs (seeds, fertilizers, etc.) from the previous growing season to the current

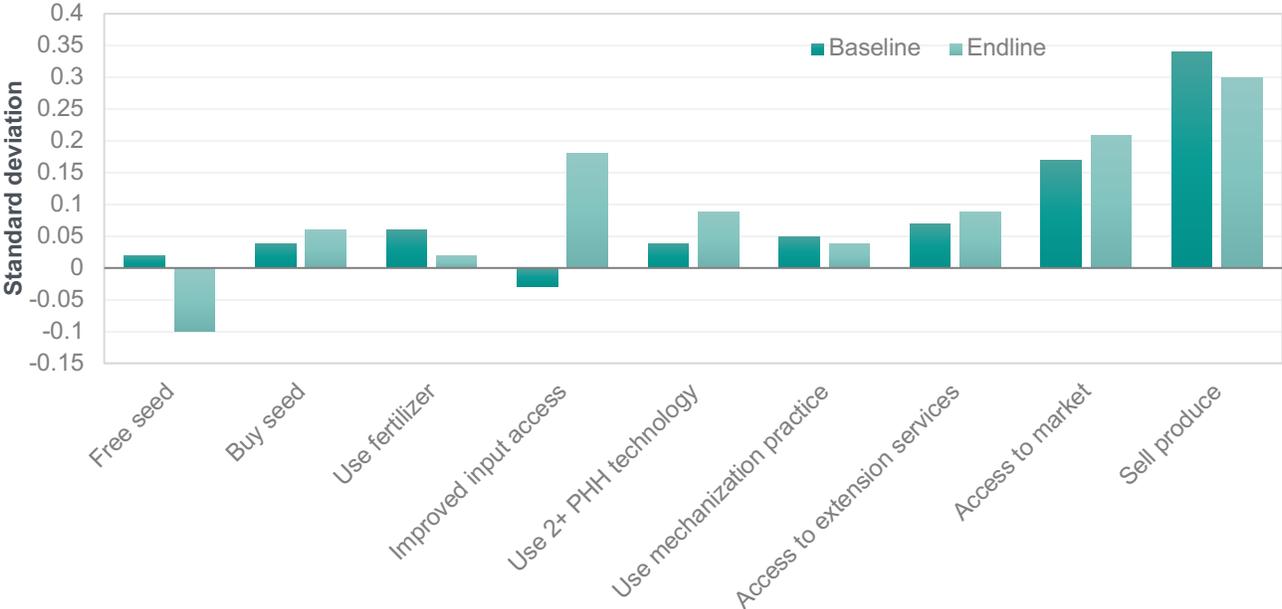
Group	Baseline Estimate	95% CI	Endline Estimate	95% CI
All farmers	46.73	38.75-54.72	40.58	35.69-45.47
Refugees	23.02***	13.01-33.04	49.22***	43.09-55.34
Hosts	52.91***	43.43-62.39	35.77***	29.01-42.53
Yumbe	31.29***	19.02-43.57	41.13	35.01-47.24
Moyo	55.16***	45.17-65.15	40.11	32.69-47.53
Women	34.82***	23.98-45.66	40.65	33.99-47.31
Men	58.63***	47.36-69.90	40.51	33.34-47.68
Under 25	43.24	19.19-67.29	51.22	33.18-69.26
Over 25 years	47.19	38.74-55.65	39.6	34.53-44.67

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01 for comparison of subgroups (refugees versus host community farmers, Yumbe versus Moyo, women versus men, under versus over 25 years). Non-overlapping confidence intervals indicate a significant difference between baseline and endline.

Econometric modelling results / data visualizations

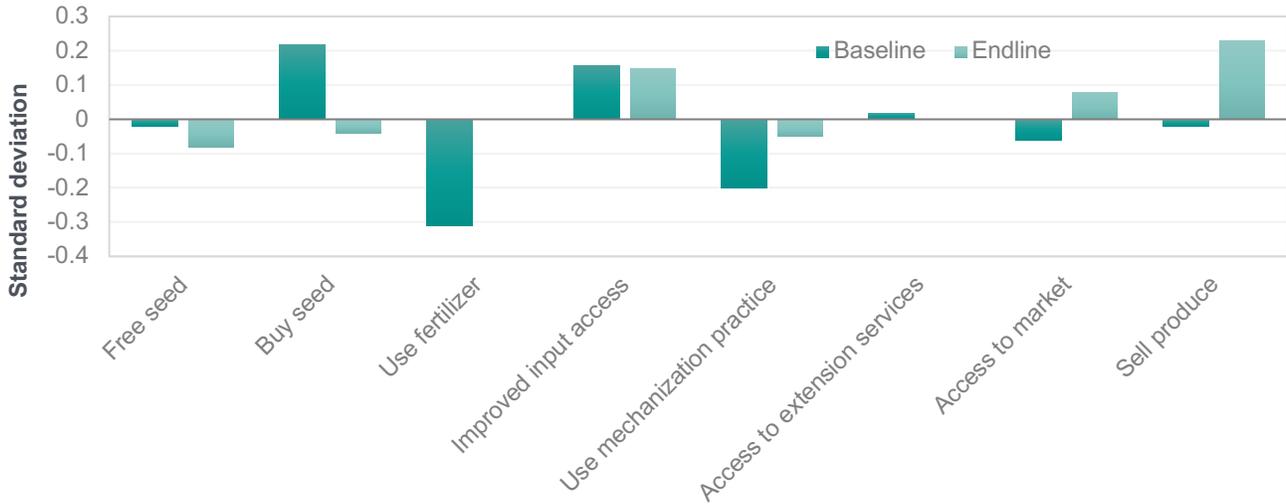
Given the survey design reverse causality cannot be ruled out for any of these associations - that is, the direction of the relationship cannot be established. For instance, in Figure 4.1.10.1 improved input access may increase agricultural income or higher agricultural income may lead to improved input access. While confidence intervals are provided as a means to assess significant change from baseline to endline, any significant differences *cannot* be attributed directly to the programme based on the survey design. However, subgroups may be compared among baseline and endline results to identify significant differences.

FIGURE 4.1.10.1: AGRICULTURAL INCOME



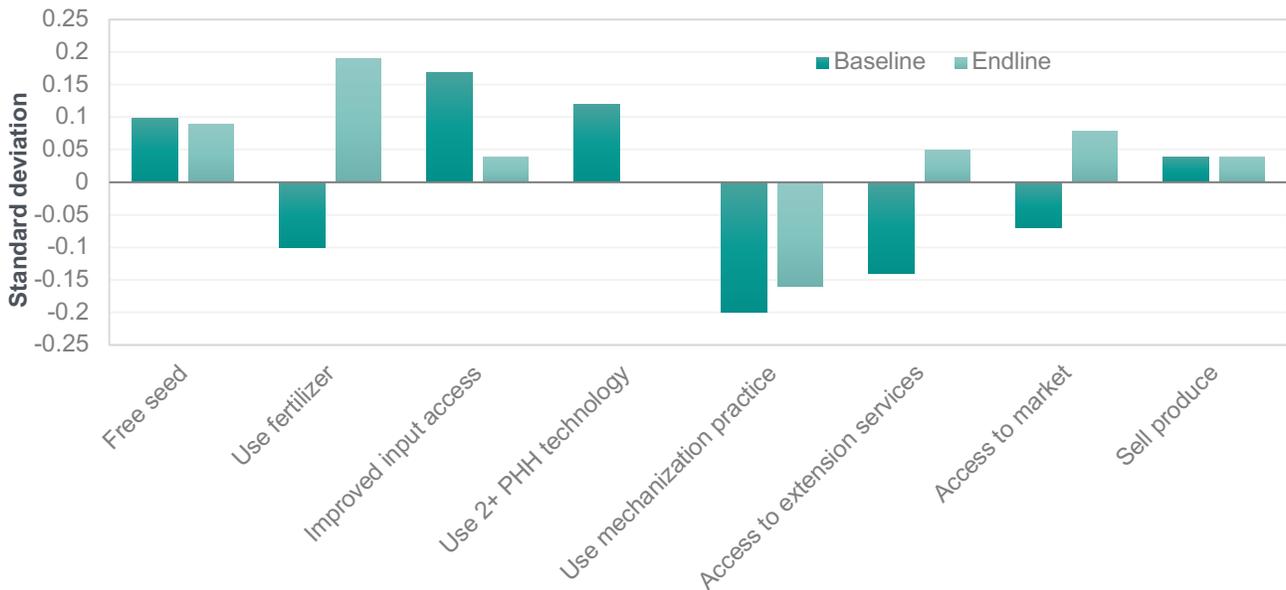
Notes: Baseline is the bar on the left and endline on the right for each enabling factor tested. Transparent bars indicate no significance while shaded bars with data labels indicate significant results. Results are standardized so may be compared for magnitude across enabling factors (i.e. 0.34 has a larger associated than 0.17).

FIGURE 4.1.10.2: USE OF 2+ PHH PRACTICES



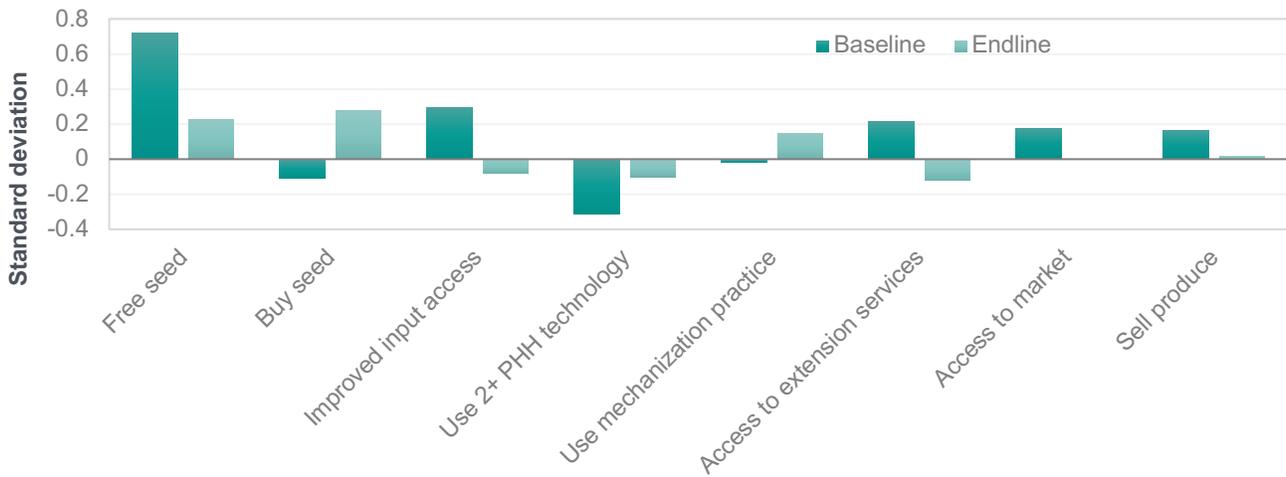
Notes: Baseline is the bar on the left and endline on the right for each enabling factor tested. Transparent bars indicate no significance while shaded bars with data labels indicate significant results. Results are standardized so may be compared for magnitude across enabling factors (i.e. 0.34 has a larger associated than 0.17).

FIGURE 4.1.10.3: PURCHASE OF SEED



Notes: Baseline is the bar on the left and endline on the right for each enabling factor tested. Transparent bars indicate no significance while shaded bars with data labels indicate significant results. Results are standardized so may be compared for magnitude across enabling factors (i.e. 0.34 has a larger associated than 0.17).

FIGURE 4.1.10.4: PURCHASE OF FERTILIZER



Notes: Baseline is the bar on the left and endline on the right for each enabling factor tested. Transparent bars indicate no significance while shaded bars with data labels indicate significant results. Results are standardized so may be compared for magnitude across enabling factors (i.e. 0.34 has a larger associated than 0.17)

Pilot project logframe indicators

Table 11.1: Logframe indicators

Indicator	Definition	Target	Baseline	Endline
Farmers have better access to goods and services	Number of HHs that have access to extension training, have access to storage, links to offtakers	100%	19.09% (14.95-23.22%)	22.41% (17.74-27.09%)
Increased income and resilience for refugees and host communities in West Nile	Number of HHs in Moyo and Yumbe districts with 15% real increase in agricultural income	15% increase from baseline	125,760 (UGX) \$110 PPP 2017 (57-163)	198,287 (UGX) \$173 PPP 2017 (125-221)

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