



MARKET SYSTEM INTERVENTIONS AND RESILIENCE ASSESSMENT

RESILIENCY THROUGH WEALTH AGRICULTURE AND
NUTRITION (RWANU)



MARKET SYSTEM INTERVENTIONS AND RESILIENCE ASSESSMENT

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TABLE OF CONTENTS

LIST OF ACRONYMS	IV
EXECUTIVE SUMMARY.....	1
1. INTRODUCTION.....	9
1.1. CONTEXTUAL IMPORTANCE OF THE STUDY	9
1.2. BACKGROUND ON RWANU	9
1.3. OBJECTIVES OF THE MARKET SYSTEM ASSESSMENT	10
1.4. ORGANIZATION OF THE REPORT	10
2. METHODOLOGY	11
2.1. APPROACH TO THE ASSESSMENT: FRAMEWORK AND METHODS.....	11
2.2. SAMPLING	12
2.3. DATA COLLECTION	13
2.4. DATA ANALYSIS	14
3. SAVINGS AND CREDIT ACCESS	14
3.1. DESCRIPTION OF INTERVENTION AREA.....	15
3.2. IMPACT OF SAVINGS AND CREDIT ACCESS ON HOUSEHOLD RESILIENCE	16
3.2.1. <i>Access to profitable output markets, affordable inputs and services, extension, and affordable credit.....</i>	16
3.2.2. <i>Women’s participation in decision-making, income generation and income allocation.....</i>	17
3.2.3. <i>Social and economic networks.....</i>	18
3.2.4. <i>Diversified income sources and production systems</i>	18
3.2.5. <i>Use of agricultural practices and technology that are adapted to stressors, and adaptable.....</i>	19
3.2.6. <i>Household asset base and access to food</i>	19
3.3. IMPACT ON SAVINGS AND CREDIT ACCESS DEVELOPMENT MARKET RESILIENCE	20
3.3.1. <i>Diversity of related products and diverse market channels.....</i>	20
3.3.2. <i>Redundancy of multiple buyers, sellers and service providers.....</i>	20
3.3.3. <i>Trusting relationships that allow cooperation, communication, learning and innovation.....</i>	21
3.3.4. <i>Market governance and policy environment characterized by transparency, equity and consistency</i>	21
3.4. GAPS AND REQUIRED ACTIONS TO STRENGTHEN RESILIENCE AND SUSTAIN OUTCOMES	21
3.5. SUSTAINABILITY	22
4. BUSINESS DEVELOPMENT SUPPORT TO YOUTH AND WOMEN	22
4.1. DESCRIPTION OF MARKET INTERVENTION.....	23
4.2. IMPACT OF BUSINESS DEVELOPMENT SUPPORT TO YOUTH AND WOMEN ON HOUSEHOLD RESILIENCE.....	23
4.2.1. <i>Access to profitable output markets, affordable inputs and services, extension, and affordable credit.....</i>	23
4.2.2. <i>Women’s participation in decision-making, income generation and income allocation.....</i>	24
4.2.3. <i>Social and economic networks.....</i>	24
4.2.4. <i>Diversified income sources and production systems</i>	25
4.2.5. <i>Use of agricultural practices and technology that are adapted to stressors, and adaptable.....</i>	26
4.2.6. <i>Household asset base and access to food</i>	26
4.3. IMPACT OF BUSINESS DEVELOPMENT SUPPORT TO YOUTH AND WOMEN ON MARKET RESILIENCE	27
4.3.1. <i>Diversity of related products and diverse market channels.....</i>	27
4.3.2. <i>Redundancy of multiple buyers, sellers and service providers.....</i>	27
4.3.3. <i>Trusting relationships that allow cooperation, communication, learning and innovation.....</i>	27
4.3.4. <i>Market governance and policy environment characterized by transparency, equity and consistency</i>	28
4.3.5. <i>Gaps and required actions to strengthen resilience</i>	28
5. CROP AND LIVESTOCK INPUTS AND SERVICE DEVELOPMENT	28

5.1.	DESCRIPTION OF CROP AND LIVESTOCK INPUTS AND SERVICE DEVELOPMENT INTERVENTION.....	29
5.2.	IMPACT ON CROP AND LIVESTOCK INPUTS AND SERVICE DEVELOPMENT ON HOUSEHOLD RESILIENCE	31
5.2.1.	<i>Access to profitable output markets, affordable inputs and services, extension, and affordable credit.....</i>	31
5.2.2.	<i>Women's participation in decision-making, income generation and income allocation</i>	34
5.2.3.	<i>Social and economic networks.....</i>	35
5.2.4.	<i>Diversified income sources and production systems</i>	36
5.2.5.	<i>Use of agricultural practices and technology that are adapted to stressors, and adaptable.....</i>	38
5.2.6.	<i>Household asset base and access to food</i>	39
5.2.7.	<i>Gaps and required actions to strengthen resilience</i>	40
5.3.	IMPACT OF CROP AND LIVESTOCK INPUTS AND SERVICE DEVELOPMENT ON MARKET RESILIENCE	41
5.3.1.	<i>Diversity of related products and diverse market channels.....</i>	41
5.3.2.	<i>Redundancy of multiple buyers, sellers and service providers.....</i>	42
5.3.3.	<i>Trusting relationships that allow cooperation, communication, learning and innovation.....</i>	43
5.3.4.	<i>Market governance and policy environment characterized by transparency, equity and consistency</i>	45
5.3.5.	<i>Gaps and actions needed to strengthen resilience</i>	46
5.3.6.	<i>Sustainability</i>	46
6.	BULK GRAIN MARKETING AND BLOCK FARMING	47
6.1.	DESCRIPTION OF GRAIN BULKING AND BLOCK FARM INTERVENTIONS	47
6.2.	IMPACT OF BULK GRAIN MARKETING AND BLOCK FARMING ON HOUSEHOLD RESILIENCE	49
6.2.1.	<i>Access to profitable output markets, affordable inputs and services, extension, and affordable credit.....</i>	49
6.2.2.	<i>Women's participation in decision-making, income generation and income allocation</i>	50
6.2.3.	<i>Social and economic networks.....</i>	51
6.2.4.	<i>Diversified income sources and production systems</i>	52
6.2.5.	<i>Use of agricultural practices and technology that are adapted to stressors, and adaptable.....</i>	52
6.2.6.	<i>Household asset base and access to food</i>	53
6.2.7.	<i>Gap and required actions to strengthen resilience</i>	53
6.3.	IMPACT OF BULK GRAIN MARKETING AND BLOCK FARMING ON MARKET RESILIENCE	54
6.3.1.	<i>Diversity of related products and diverse market channels.....</i>	54
6.3.2.	<i>Redundancy of multiple buyers, sellers and service providers.....</i>	54
6.3.3.	<i>Trusting relationships that allow cooperation, communication, learning and innovation.....</i>	55
6.3.4.	<i>Market governance and policy environment characterized by transparency, equity and consistency</i>	55
6.3.5.	<i>Gaps and actions needed to strengthen resilience</i>	56
6.3.6.	<i>Sustainability</i>	56
7.	HONEY VALUE CHAIN DEVELOPMENT	57
7.1.	DESCRIPTION OF THE HONEY VALUE CHAIN DEVELOPMENT INTERVENTION.....	57
7.2.	IMPACT OF HONEY VALUE CHAIN DEVELOPMENT ON HOUSEHOLD RESILIENCE	58
7.2.1.	<i>Access to profitable output markets, affordable inputs and services, extension, and affordable credit.....</i>	58
7.2.2.	<i>Women's participation in decision-making, income generation and income allocation</i>	59
7.2.3.	<i>Social and economic networks.....</i>	59
7.2.4.	<i>Diversified income sources and production systems</i>	60
7.2.5.	<i>Use of agricultural practices and technology that are adapted to stressors, and adaptable.....</i>	60
7.2.6.	<i>Household asset base and access to food</i>	61
7.3.	IMPACT HONEY VALUE CHAIN DEVELOP ON MARKET RESILIENCE.....	61
7.3.1.	<i>Diversity of related products and diverse market channels.....</i>	61
7.3.2.	<i>Redundancy of multiple buyers, sellers and service providers.....</i>	61
7.3.3.	<i>Trusting relationships that allow cooperation, communication, learning and innovation.....</i>	61
7.3.4.	<i>Market governance and policy environment characterized by transparency, equity and consistency</i>	62
7.3.5.	<i>Gaps and what needs to be done to further strengthen resilience,.....</i>	62
7.3.6.	<i>Sustainability</i>	63
8.	IMPACT OF PROJECT INTERVENTION ON HOUSEHOLD RESILIENCE, FOOD SECURITY AND NUTRITION.....	63

8.1.	IMPACT ON HOUSEHOLD RESILIENCE	63
8.2.	IMPACT ON MARKET SYSTEM RESILIENCE	67
8.3.	IMPACT ON HOUSEHOLD FOOD ACCESS AND NUTRITION	68
8.3.1.	<i>Impact on household food availability.....</i>	<i>68</i>
8.3.2.	<i>Impact on household nutrition for PLW and Children under 5 years.....</i>	<i>71</i>
9.	CONCLUSIONS AND RECOMMANDATIONS.....	73
9.1.	CONCLUSIONS	73
9.2.	RECOMMENDATIONS	76
9.2.1.	<i>Recommendations for strengthening household resilience.....</i>	<i>76</i>
9.2.2.	<i>Recommendations for strengthening market system resilience.....</i>	<i>76</i>
10.	REFERENCES	78

LIST OF ACRONYMS

ASCAs	Accumulated Savings and Credit Associations
CAHW	Community Animal Health Workers
CERUDEB	Centenary Rural Development Bank
Concern	Concern Worldwide
DAO	District Agricultural Officer
DCO	District Commercial Officer
DVO	District Veterinary Officer
FGD	Focus Group Discussions
FICA	Farm Input Care Centre Ltd.
FTGs	Farmer Training Groups
FY	Fiscal Year
HEs	Health Educators
HPs	Health Promoters
IY	Implementation Year
KABA	Karamoja Agribusiness Association
Kg	Kilograms
MAAIF	Ministry of Agriculture Animal Industries and Fisheries
MFSC	Micro Finance Support Centre Ltd.
MCG	Mother Care Groups
NSCS	National Seed Certification Service
OWC	Operation Wealth Creation
RWANU	Resiliency through Wealth, Agriculture and Nutrition
SO	Strategic Objective
SACCO	Savings and Credit Cooperative
TOT	Training of Trainers
UBOS	Uganda Bureau Of Statistics
UNADA	Uganda National Agro-Dealers Association
UNBS	Uganda National Bureau of Standards
WLG	Women Livestock Groups
VSLA	Village Saving and Loan Association
WHH	Welthungerhilfe

EXECUTIVE SUMMARY

Resiliency through Wealth, Agriculture, and Nutrition (RWANU) is a five-year Development Food Assistance Program funded by USAID's Office of Food for Peace. The program has been implemented in 16 sub-counties in the districts of Amudat, Moroto, Napak, and Nakapiripirit by ACDI/VOCA in partnership with Concern Worldwide and Welthungerhilfe. Project overall goal is to reduce food insecurity among vulnerable people in South Karamoja. RWANU commissioned a study to assess how specific RWANU market systems interventions have contributed to: i) improved household and market system resilience; ii) improved household nutrition (e.g., access to food on a sustained basis; reduced incidence of malnutrition among children under five, and pregnant and lactating women).

Overall, the team found strong evidence that each intervention helped build household and market system resilience, in both similar and complementary ways. Interventions showed varied levels of likely long-term sustainability. Despite RWANU's positive impacts, there are some needs and gaps for future projects to address, in order to strengthen resilience and sustainability further. This report summarizes findings for five market systems intervention areas, with a focus on characterizing each intervention's impacts on household and market system resilience, the likely sustainability of the intervention, gaps that need to be filled to foster or strengthen resilience, and key steps future projects can take to fill these gaps and ensure sustainability.

Study approach and methodology: The study used USAID's definition of resilience as the framework to

guide assessment of how RWANU market interventions fostered resilience at the household and market systems levels. "Resilience is the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth." The assessment considered specific factors affecting resilience at household and market system levels (Text box). The study was largely qualitative but drew on quantitative data as appropriate; and incorporated both secondary and primary research. Secondary data was collected from project reports and records, group records, and national level documents. Primary data was collected from a total of 18 FGDs and 12 in-depth interviews with beneficiary farmers, seven key informant interviews with district local government staff and leaders; 22 value chain actor interviews including private agro dealers, CAHWs, tillage service providers, buyers, financial service providers, and national seed company. Anthropometric data were collected from a total of 121 children under five years. Thematic analysis and descriptive statistics were used to analyze the qualitative and quantitative data respectively.

Determinants of household resilience

- Access to profitable output markets, affordable inputs and services, extension, and affordable credit
- Women's participation in decision-making, income generation & allocation
- Social and economic networks
- Diversified income sources and production systems
- Use of adaptive agricultural practices and technology
- Household asset base and access to food

Determinants of market resilience

- Diversity of products and market channels
- Multiple buyers, sellers, service providers (redundancy)
- Communication flows (trust, cooperation, analytics)
- Market governance (transparency, fairness, consistency)
- Predictable, supportive policy environment

Findings

i) Household and Market System Resilience

Saving and Credit Associations: This intervention was geared at facilitating increased access to credit. RWANU supported formation of 580 Accumulated Savings and Credit Associations (ASCAs), equipping the members with skills, and facilities in form a saving kit for group savings and credit. Access to credit has strengthened household resilience. It has enabled consumption smoothening allowing households to solve pressing needs, hold on to produce, and avoid distress sell of productive assets notably livestock. Though this is consumption debt which would potentially make households more vulnerable, by minimizing distress sale of livestock and crop produce until prices improve, the ASCAs have acted as an enabler for the bulking groups and hence increased incomes from the higher prices. In case of livestock it has protected and enabled growth of herds which supports wealth accumulation. Households have also used the credit to invest in farming activities notably purchase of improved seeds, hiring tractor tillage services for increasing acreage, and drugs for treating and spraying livestock which has increased adaptive capacity of households. The ASCAs have provided capital to support investing and scaling up income generating activities like brewing, produce trade and food vending. This has built the capacity of beneficiaries to be active market players and enable them to build the requisite assets to withstand future shocks. It has supported diversifying of household sources of income and spreading of risks. RWANU beneficiaries have acquired knowledge on financial management. The ASCAs provide a learning platform to farmers' financial inclusion.

Access to credit has strengthened market resilience. Access to credit has enabled farmers appreciate and adapt market approaches to enhance their livelihoods. ASCAs provide three products (saving, welfare loan for emergencies and main loan fund) with clear terms which has increased the range of financial products available to their members compared to before RWANU when they would only access loans from relatives or neighbors that were not reliable. ASCAs have started forming umbrella organizations such as Kopopwa SACCO which position them to take advantage of available market opportunities and access bigger loan products. Access to credit has empowered bulking groups and households to hold on to their crops and demand for better prices from buyers of agricultural produce. Commercial banks operating in the region have increased from one in 2012 to three in 2017 though they are all based in Moroto. ASCAs have been linked to financial service providers like Centenary Bank and Micro-Finance Support Centre which increases odds of accessing financial services and products. A host of organizations are involved in capacity building of the groups on savings and credit associations provide a foundation for ASCAs' continued access to capacity strengthening. It is highly likely that the ASCAs will continue to serve their members well beyond end of RWANU. The SACCOs though built on strong foundation are still young and they still need nurturing to ensure that they enhance odds of survival. Emergency of government programs which promote rural financial inclusion also provides a foundation for continued community access to financial services.

However, weak links between the ASCAs with financial service providers, and suppliers of materials and stationary for saving kits; low savings volume coupled with short period groups have engaged in saving are gaps that need to be addressed to strengthen resilience. Future programs should continue to nurture growth of the ASCAs, promote a bank linkage program, engage in advocacy for banks to enhance their outreach services through agency banking; and promote a village agent model among the ASCAs.

Business development support to youth and women: This intervention involved equipping of groups with business skills, group dynamics and leadership, supporting development of business plans, skills to run business enterprises, and provision of grants with phased disbursement of funds to a group of youth and women to finance an identified project. RWANU supported 36 groups (8 women groups and 28 youth groups) with training and grants. Grants helped create employment for the involved youth and women, bring services closer to the people and linked them to providers of other services. The grants have enabled beneficiaries to enter into a higher value added function in the value chains thereby positioning them to earn more. For instance members

of Apeded tyre mending youth group sold milled rice in Jinja, Kanegu, and Kanamokol livestock trading groups traded even in markets outside the district. Grants have allowed women to venture into livestock marketing which was not common before. They are learning their trade with mentoring from the men (men and women go together in the market to sale the livestock). The grants and training that preceded then facilitated learning and improving knowledge with regards to how to run a business enterprise. Beneficiaries have transferred the skills and used the earnings after sharing to invest in other income generating activities. This positively impacts on their adaptive capacity. Investing proceeds from the grant enterprise into ASCAs has provided more funds for member to borrow.

The grants have enhanced social capital with groups sharing information on markets, and benchmarking performance of enterprises engaged in by others. This provides a foundation for learning and innovation thereby positively impacting on their adaptive capacities. Income from grant enterprises used to buy food thereby contributing to household food access and nutrition. However this impact is limited by the short duration the groups have undertaken the grant supported enterprises and coverage of the grants. The grants diversify income sources and have the potential to strengthen households ability to withstand effects of shocks and stressors like floods, family emergencies and drought.

Training groups on how to manage a group enterprise and record keeping strengthened their ability to

run business enterprises and increase their participation in the market place. Grants enabled groups to engage in enterprises they were not involved in before and also to upgrade their participation in value chains. Trusting relationships have emerged with groups entrusting some of their members with marketing responsibilities who in turn declare the proceeds from sales to the entire members. Sharing of market information among groups and other traders engaged in the same enterprises is facilitating informed decision making and identification of which areas to buy from and markets to sell in.

We collaborate with Kanegu livestock trading group in Naduget, Moroto and groups in Matany, and Iriiri in Napak district and other livestock traders. We share information on market prices, availability and quality of animals. This has helped us to easily locate the animals to buy, prevented wasting time, and promoted good relationship between our groups in Moroto, those in Napak and traders (*Kanakomol Group, Moroto*).

The groups visited in this study seemed to be stable and likely to continue beyond RWANU. This notwithstanding individuals taking advantage of other members in the group presents a threat to continued realization of benefits from the grant enterprises. Groups would need to institute clear processes for sharing of benefits from their enterprises. Weak linkage between the RWANU grant groups and other actors; and inability to visualize and take advantage of existing opportunities to further diversify and grow incomes from the grant enterprise are gaps which need to be filled to strengthen resilience.

Access to crop and livestock production inputs and services: This intervention was geared at facilitating the adoption of improved smallholder farm (crop) and livestock management practices, as well as establishing of a larger and stronger inputs and services sector. It involved improving technical skills of small farmers on crop production through 508 demonstration sites and 177 block farm groups. A total 6,279 RWANU farmers as well as 2,462 non-RWANU farmers were linked to input dealers to access improved seeds and other inputs. Impacts at household level greatly depend on the season, adoption of resilient technologies and agronomic practices, as well as a diversity of crops and livestock. These increase the absorptive and adaptive capacities of the households to absorb and respond to effects of climate events like drought, floods, and increased prevalence of livestock diseases. The range of crops grown helps to mitigate risk through diversification, while access to livestock inputs has helped to reduce losses, improve herd size and performance hence contributing to wealth creation.

Positioning households to purchase inputs from agro-input dealers has enhanced their ability to choose suitable varieties, and ensure sustainable access to information provided by the agro input dealers. Belonging to Farmer Training Groups (FTGs), and Women Livestock Groups (WLGs) has enhanced women's access to training, technologies, and awareness on sources of inputs. Adoption of suitable varieties, good agronomic practices, and expansion of acreage from an average of 0.25 acres to 1.5 acres has triggered increased production. Average yields for three cases covered in the in-depth interviews have increased from 426kg of maize before RWANU to 813kg per acre (see examples in text box). This has consequently increased household access to food, assets, and diversified income sources. Households invest proceeds from increased production into assets that support wealth creation, other income generating activities and buying food stuffs that were not regularly on the menu.

I got 6000kg of maize from 6 acres of hybrid 520 compared to 1200kg I used to get from 3 acres before RWANU. 2400kg were kept aside for home consumption and 3600kg were sold. I bought 3 acres of land, 2 goats and 2 cows (Teddy Akol, Lokana FG, Namalu).

Last year I got 840kg from 1 acre of maize compared to 120kg I used to get from 0.25 acres before RWANU (*Losik David, Namalera FG Mourita, Nakapiripriti*)

I got 600kg of maize from 1 acre of maize compared to less than 100kg I used to get from about 0.25 acres before RWANU (*Zipola, Mwoto FG Agule, Karita Amudat district*)

Bought oxen using proceeds from cassava we planted in 2015 (Cristine Maranga Lokungurit, Lorengechorwa, Napak)

The market system has grown, diversified and gained capacity at the same time. The agro dealers and community animal health workers have facilitated increased access to inputs, advice, and services. They are a source of advice to farmers which provides a foundation for sustainable access to information, learning and innovation for the farmers. The partnerships between the agro dealers and suppliers on one side, the public veterinary service providers and the CAHWs or village agents provide a strong foundation for sustainable farmer access to crop and livestock inputs and services. It is our view that agro- and CAHWs will continue to provide services to farmers. The dealer that existed before have taken advantage of RWANU to increase their capacities to supply inputs. Agro-input dealers and CAHWs noted that they will continue to provide services to farmers. Capacity building of the agro-dealers, and CAHWs coupled with linkages they have established with their respective suppliers provides a foundation for continued provision of services. Farmers have appreciated the improved varieties, and livestock drugs, and know where to find them. It is highly likely that they will continue to source inputs from agro-dealers and continue to use them together with the associated production practices.

However limited range of crops promoted in the project; lack of knowledge on proper seed selection and recommended number of recycling for the open pollinated varieties, relatively small sizes of land under production, limited awareness of existence of agro-input shops in the sub-counties by some farmers are gaps that need to be addressed to strengthen household resilience. Continued provision of free inputs to farmers by government programs and other actors, limited crop sector agro-input dealer knowledge on the regulatory framework for the business they engage in, limited income streams engaged in by the agro-input dealers, lack of standardized certification criteria for CAHWs are gaps that need to be addressed to strengthen market resilience.

Grain bulking and block farming: RWANU promoted establishment of collective marketing groups

and bulking centers, and linked them to buyers. Bulking has positioned farmers to receive higher prices hence increasing their earnings from produce. Households that bulked received Uganda shillings (UGX) 150/kg, 200kg, and 500/kg higher than those who sold unilaterally in 2015, 2016, and 2017 respectively. The bulking centers sell directly to big buyers as opposed to local middlemen. Farmers hold on to produce for several month and sell when prices increase. The bulking centers have enabled farmers to venture into produce trade by buying from other farmers after harvest or buying from other places to resell to community members for food. This has widened incomes streams for the members but also ensured availability of food in the region.

Members of bulking groups on average earned UGX 280 (USD 0.08) per kg of grain over and above prices received by those who sold unilaterally in the last 3 years.

Block farms have helped increase beneficiaries' knowledge on sources of inputs, and good agronomic practices. They have stimulated change of mind set towards commercial oriented production and increasing acreage under crops. The block farms have facilitated introduction of new varieties for cassava, positively impacting on adaptive capacities of the households. These interventions have encouraged farmer adoption of production practices and enhanced social capital through increasing networks, and sharing of information. Block farms positions farmers to share resources and increase efficiency of the production process through reduced transaction costs for purchasing inputs, and shared labor. Sharing of produce from the block farms enhance availability of food in the member households. The clear record keeping procedures ensure accountability and transparency, strengthen trust in the system and hence offer a good foundation for continued use of the bulking centers.

Grain bulking and block farms strengthen farmer capacity to withstand and respond to effects of drought through use of suitable technology, enhancing food reserves, cassava production and higher earnings that support consumption smoothening. However low coverage due to limited number of groups and members involved in grain bulking and block farms coupled with side selling limit the impacts from these interventions. Increasing quantities bulked would enhance access to big buyers, better prices and hence more earnings for the members.

Establishment of bulking centers has strengthened the marketing system. Farmers collectively sell up to five commodities to traders from within and outside the project districts and community members during times of scarcity. A host of buyers offer alternatives to chose from and enable groups to earn premium prices compared to selling to middlemen. RWANU has catalysed use of standard measurements in selling of grain by members of the bulking groups who previously sold individually using local containers that are suspect to manipulation. Bulking groups share market information which enables members to make informed decisions about selling prices.

Big buyers and traders have started engaging with the groups, this provides a foundation for building confidence and trust. Bulking group's engagement in produce trading, and establishment of structures and record keeping procedures that enhance accountability, and trust have increased their capacity to meet operational expenses for the premises, continued supply of quality produce which will attract buyers, and benefit their members. It is likely that the bulking centres and block farms will continue beyond RWANU. However limited number of people who bulk, side selling, weak linkages with specific buyers, inadequate provision for office bearers who support the collective marketing function, and limited use of ICTs to access market information are gaps that should be addressed to strengthen resilience of the system. Future programs should continue to sensitize members of farmer groups on the benefits of collective marketing; facilitate establishment of links with specific buyers, and strengthen capacity to use ICTs for market intelligence.

Honey value chain development: Intervention has strengthened household resilience. Bee keepers are now selling honey at premium prices. Prices increased from UGX 1500 /kg (USD 0.42) before RWANU to 5000/kg

(USD 1.41) in 2015 to UGX 6000/kg (USD 1.69) in 2016 and UGX 7500/kg (USD 2.11) in 2017. RWANU has promoted capacity building of communities in honey production. Trained honey Community Based Facilitators (CBFs), and artisans facilitate continued farmer access to knowledge on apiary management and modern hives made with locally available materials. These are a resource that will continue to be used by the community members well after end of RWANU. Honey producers acquired knowledge on siting, baiting hives to enhance their colonization, pest management in apiary, and processing. Provision of starter kits and hives has facilitated farmer use of technologies in honey production. This has spurred participation of women in an activity that was previously the domain of men. Groups work together in setting up and managing the apiary sites which increases their social capital and shared learning. Honey producers now sell their honey collectively to a reliable buyer, and have formed associations which increase their voice and access to information. Honey groups utilizing their bridging social capital to access and share information with other groups

Honey production has increased the incomes sources for the households that ventured into it following RWANU interventions and also ensured higher incomes for those that were already engaged in the activity due to increased production triggered by use of better hives, apiary management and harvesting practices. The intervention enabled households to diversify income to mitigate risk which positively impacts on their adaptive capacities. However increment in incomes was from very low levels and impact is limited by low scale of investment, coverage, and seasonality.

The market system has been strengthened and streamlined. Entry of Golden Bees in the value chain has facilitated farmer access to technical knowledge that they may not have got. This increases their ability to learn and innovate. Honey is now bought using standard measurements, and presence of many buyers has facilitated increase in prices from below UGX 3000 (USD 0.84) in 2014 to UGX 7000-8000 (USD 1.97-2.25) in 2017. Honey producers have established associations which position them to increase their voice in demanding for services and engaging with buyers.

Golden Bees established an outlet in Moroto, there is a local buyer in Iriiri, Napak and also in Karita who process, packs and sell in Kampala, while other buyers come from Kenya. Emergence of local buyers in the districts, those from Kenya and Golden Bees provide alternatives to the farmers. The honey associations provide a foundation for stronger engagement of the honey producers in the market beyond the farm gate. It is highly likely that farmers will continue to engage in honey production and the buyers will also continue to operate in the region.

The limited number of farmers engaged in honey production coupled with small number of hives owned by each farmer; and charcoal burning with its negative effect on foliage are factors that continue to limit household level impacts from the honey value chain. Golden Bees not having reached and created rapport with all bee keepers that benefited from RWANU coupled with relatively young and inexperienced honey associations are gaps that need to be addressed to strengthen market resilience.

Overall impact on household resilience RWANU has strengthened household resilience. The ASCAs have provided a reliable source of credit and mobilization of savings that support consumption smoothening, protect assets, support investment in other income generating activities, and allow households to hold on to produce to sale later at higher prices. It has facilitated farmers to access inputs of their choice, adoption of suitable technologies and practices as well as expansion of acreage. In 2016 RWANU beneficiaries who grew sorghum, maize, and groundnuts on average planted 2 acres, 1.46 acres, and 1 acre of these crops respectively increasing from albeit very low levels about 0.25 acres before RWANU. This has triggered increased production and yields in the face of erratic rains hence increasing food availability. Increased access to livestock inputs and services and farmer adoption of livestock health management practices has reduced death of animals, improved performance of the herds and strengthened farmer capacity to with stand shocks and stressors.

Project interventions have strengthened social capital among beneficiaries which facilitates access to new knowledge, and resources they would not have got. For instance ASCAs provide a social safety net to address

pressing needs for cash; farmers work together in implementing the grant enterprises; members of women livestock groups collaborate in management of goat health, housing, and feeding; and honey producers support each other in siting of apiary, management and harvesting. Block farms and graining bulking has enabled farmers to get higher earnings from their produce. Multi-prolonged approach has supported acquisition of knowledge and engaging in several enterprises that provide multiple sources of incomes. The diversified income sources have contributed to reduced reliance on coping strategies that are destructive to the environment. The project has spurred increase in household assets that support wealth generation and accumulation.

Impact on market system resilience: The market system has grown, diversified and gained capacity at the same time. ASCAs have started forming umbrella organizations such as Kopopwa SACCO which position them able to take advantage of bigger loan products. ASCAs members are now to be active market players and the host of service providers involved in capacity strengthening of ASCAs provides a basis for continued ASCA access to capacity building services. Grants have enabled groups to upgrade their participation in value chains. Strengthening of market led service provision has enhanced farmer access to crop and livestock inputs and services. Agro dealers stock a range of inputs which gives farmers options to choose from. Local agro-dealers have established relations with suppliers which facilitate faster stocking of inputs and joint stimulation of demand. Other actors have started to use the RWANU supported agro dealers to supply inputs to their beneficiaries. RWANU interventions have strengthened agro dealer capacity to identify, stock, and supply quality inputs to farmers

Bulking groups that only emerged with RWANU's support are now selling up to 5 commodities to traders from within and outside the district. Some bulking groups also buy from other places to sale to locals on retail as food during times of scarcity. Many buyers who approach the groups for the produce increase options groups can sell to. Bulking centers catalyze selling of grain using standardized measurements and sharing of market information that enable members to make informed decisions with regards to when to sale. Honey producers now have a reliable market for honey and propolis, market ensures payment of premium prices and use of standardized measurements. Formation of honey producers' associations has positioned them to increase their voice and participation in the market.

ii) Nutrition

Impact on household access to and availability of food: RWANU has contributed to increased food availability in the beneficiary households. This has been attained through increasing production levels for certain crops relative to before the project due to use of resilient varieties (*see Teddy Akol example in text under access to crop and livestock inputs and services above*), expansion of acreage, adoption of good agronomic management practices, increase in diversity of crops grown, diversified incomes and access to credit which address the need for immediate cash to buy food. RWANU interventions mainly impacted on the income generation and production for consumption nutrition/food security pathways. Increased appreciation of crop production as a livelihood strategy; adoption of better and suitable varieties to the region, adoption of good agronomic practices; increased appreciation and adoption of livestock health management practices; and shift towards increased cooperation between couples in production of food crops provide a strong foundation for improved access and availability of food continue and sustain beyond RWANU.

Impact on nutrition for PLW and children under five years: The mean number of food groups consumed by women of reproductive age (WDDS) increase from 2.6 at baseline to 4.0 in FY 16, a figure that surpasses the end of project target of 3.5. Child malnutrition has reduced as results for weight-for-age, an overall indicator of a population's nutritional health indicate. The proportion of children under 5 who are moderately-severely underweight has reduced by 19% from 21% at baseline to 17% at the time of this study in May 2017. The 17% of prevalence of underweight children in the study sample is well below the 20.4% and 26% reported for the Karamoja sub-region, in the Food Security and Nutrition Assessment for Karamoja December 2016 and the Uganda Demographic and Health Survey 2016 respectively. Qualitative findings suggest women and children are

now getting adequate meals and there is increased diversity of foods eaten by households facilitated by own production or buying from the market using income from various activities they are engaged in now and ASCA loans.

Conclusions: RWANU has strengthened household resilience and positively impact on household food access and nutrition. Findings suggest that ***RWANU's theory of change has held true. "The improvement in household and market system resilience has resulted in reduced malnutrition in Karamoja"***. Diversification of income sources and increased food production albeit from very low levels has triggered improved household access to food and nutrition. Intervention like block farms for those cases where members realized a good crop in spite of bad weather, ensure access to food and increased incomes while ASCAs have facilitated consumption smoothening and increased earnings from sale of produce; protect and build assets, spurred investment in crop production and other income generation activities. Honey production, bulking and business development grants to youth and women have contributed to diversification and increasing household incomes to mitigate risks and avail food in the homes. However scale of investment, coverage, and short period households have engaged in these activities limit impact of these market system interventions.

Recommendations for strengthening and sustaining household level resilience: Adopt multi-prolonged approach that ensures touching many points, to move households forward; widen the range of crops and livestock types promoted, encourage continued use of improved varieties suitable to the area and the agronomic practices including soil fertility improvement and soil water conservation; as well as further expansion of acreage. Strengthen farmer capacity in identification of genuine inputs, continue to sensitize farmer groups members on costs and benefits associated with collective bulking and strengthen capacity to utilize mobile phones for access agricultural related information

Recommendations for strengthening and sustaining market system resilience: Facilitate closer engagement of ASCAs with financial service providers and other government programs that promote financial inclusion; strengthen capacity of groups to lobby for support and services from relevant government programs; engage in advocacy to spur local government officers support to market systems; support growth of commercial input supply in Karamoja and support continued existence of the collective marketing groups and bulking centers.

1. INTRODUCTION

Resiliency through Wealth, Agriculture, and Nutrition (RWANU) was a five-year Development Food Assistance Program funded by USAID's Office of Food for Peace. The program was implemented in 16 sub-counties in the districts of Amudat, Moroto, Napak, and Nakapiripirit by ACDI/VOCA in partnership with Concern Worldwide and Welthungerhilfe. In its fifth and final implementation year RWANU commissioned an assessment to evaluate how its market systems interventions have improved household resilience to stressors and recurring shocks (climate change, market volatility, etc.) and food security/nutrition among beneficiaries, and resilience in the market systems in which beneficiaries operate. The assessment adopted USAID's definition of resilience as the framework to guide the assessment: "Resilience is the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth." This report summarizes the findings and recommendations for future programming to sustain and expand outcomes and further strengthen resilience.

1.1. CONTEXTUAL IMPORTANCE OF THE STUDY

The Karamoja sub-region is composed of seven districts viz. Napak, Moroto, Kaabong, Nakapiripirit, Kotido, Abim, and Amudat. The sub-region experiences the highest levels of vulnerability in Uganda and has a history of marginalization and underdevelopment. Previous years of insecurity have exacerbated widespread poverty and the sub-region suffers from the worst development indicators in Uganda: over 80 percent of the Karamojong live in absolute poverty¹, acute and chronic malnutrition rates among children remain persistently high, and illiteracy rates among women reach over 77 percent. Karamoja is also subject to recurrent drought and other crises, during which the vast majority of people in the sub-region are reliant on humanitarian assistance. This drought crisis scenario has repeated itself in Karamoja every three to four years for decades and has been exacerbated by past conflict. These conditions disrupt lives and livelihoods as they reduce people's capacity to produce adequate food for consumption and curtail participation in income generating activities in the market. The sub-region suffers from low agricultural productivity, limited availability of production inputs and extension services and weak linkages to markets.

For a people whose livelihoods depend on crops, livestock, and other natural resources, needing to develop the ability to absorb and adapt to shocks such as violent conflicts, health epidemics, weather events and ongoing trends like climate change is becoming the norm. Building resilience against shocks and stressors is recognized not only as mechanism to survive and cope with these impacts but, increasingly, as an enabler for the achievement of development outcomes.² Drought, flash floods, increased prevalence of crop and livestock pests and diseases, and family emergencies due to ill health or death of household members were the shocks and stressors most reported by focus group participants and individuals in the in-depth interviews. Strengthening the capacities of people, households, communities and market systems in Karamoja to handle shocks and stressors is essential for achieving sustainable improvements in food security, nutrition, and economic well-being.

1.2. BACKGROUND ON RWANU

RWANU was a five-year Development Food Assistance Program funded by USAID's Office of Food for Peace, operating from 2012-17. The program was implemented in 16 sub-counties in the districts of Amudat, Moroto, Napak, and Nakapiripirit by ACDI/VOCA in partnership with Concern Worldwide and Welthungerhilfe.

¹Resilience Analysis Unit (2015). Resilience Context Analysis Resilience to food insecurity and malnutrition in Karamoja, Uganda.

²Angelica V. Ospina and Richard Heeks 2016; Prioritizing Resilience Interventions in Agricultural Livelihoods: A Ugandan Case Study

The program had an overall goal of reducing food insecurity among vulnerable people in South Karamoja, Uganda and two strategic objectives (SOs): i) Improved access to food for both men and women, and ii) Reduced malnutrition among children under five years of age and pregnant, lactating women.

Strategic Objective 1 (SO1) aimed at reducing the risks associated with rain-fed agriculture, identifying and promoting low-risk, higher-return crops, and increasing livestock ownership, while drawing households into market systems. RWANU built the capacity of small producer groups through training on technical skills, savings mobilization, basic business skills and marketing; along with linkages to input, service and output markets, and fostering low-risk trialing of improved inputs. SO2 focused on preventing malnutrition during the first 1,000 days of life through a package of curative and preventative health care, social and behavior change activities, and improved consumption of micro- and macronutrients. RWANU implemented activities around proper infant and young child feeding practices, and the nutritional needs of pregnant and lactating women (PLW) and children under five years of age, while promoting equitable intra household food distribution.

RWANU also promoted gender equity by including *both* men and women in project activities, facilitating women's participation without overburdening them, ensuring that both men and women engage in remunerative production for the market, and engaging both genders around equitable resource allocation. It supported the existing regional early warning system and introduced innovative natural resource management technologies. RWANU interventions targeted 269,559 direct beneficiaries, which includes 29,820 SO1 and 260,613 SO2 beneficiaries. An estimated 20,874 households were to benefit from livelihoods training and support.³

1.3.OBJECTIVES OF THE MARKET SYSTEM ASSESSMENT

The purpose of the study was to assess how specific RWANU market systems interventions are associated with: i) improved household and market system resilience; ii) improved household food security and nutrition, specifically access to food on a sustained basis and reduced incidence of malnutrition among children under five, and pregnant and lactating women. The six market systems interventions are:

1. Savings and credit access, via supporting the development of savings and credit associations
2. Crop and livestock inputs and services development
3. Bulk grain marketing and block farming (two, combined here)
4. Honey value chain strengthening
5. Business development support to youth and women

The study set out to:

- I. Determine if and how each intervention affected the determinants of household and market system resilience (absorption, adaptation, and transformative capacity),
- II. Establish what underlying factors RWANU modulated to yield these effects,
- III. Identify what gaps and needs remain to strengthen resilience, and
- IV. Suggest activities for follow-on program to undertake to fill gaps and sustain resilience outcomes

Across interventions, the study considered differential impacts on women and men, and youth and adults, and the factors contributing to those differences. Annex 1 gives the Scope of Work (SOW) for the assessment articulating the objectives, areas of inquiry and assessment questions.

1.4.ORGANIZATION OF THE REPORT

This report is laid out as follows. Chapter two presents the approach and methodology used in the study elaborating on sampling, data collection and analysis. Chapters three to seven present findings on each of the RWANU market system interventions. Each of these chapters starts by presenting the broad strategy for that

³ RWANU 2012: RWANU proposal revised technical narrative

market system intervention, activities undertaken by RWANU and corresponding results. Then it presents findings on impact of the market model on the various determinants of resilience at household and market system level as well as discussing how the model impacted on the absorptive and adaptive capacities. Each of these chapters ends by providing a discussion on gaps and actions that need to be undertaken to strengthen resilience. Chapter three deals with savings and credit access, chapter four covers business development grants and support to youth and women; five covers access to crop and livestock production inputs and services; six is on bulk grain marketing and block farms; and seven presents findings on honey value chain development.

Chapter eight brings out the composite effect of the program's interventions on household resilience, food access and nutrition as one of its strategic objectives. Chapter nine presents the study's conclusions and implications for future programming.

2. METHODOLOGY

2.1. APPROACH TO THE ASSESSMENT: FRAMEWORK AND METHODS

The study used USAID's definition of resilience as the framework to guide the assessment of how RWANU market systems interventions have fostered resilience at the household and market systems levels. "Resilience is the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth."⁴ The assessment focused on specific determinants affecting resilience at household and market system levels drawn from ACDI/VOCA's work on the USAID-funded Leveraging Economic Opportunities project, depicted in table 2.1 below.⁵

Table 2.1: Specific determinants of resilience at household and market system level

Household level	Market system level
<ul style="list-style-type: none"> • Access to profitable output markets, affordable inputs and services, extension, and affordable credit • Women's participation in decision-making, income generation and income allocation • Social and economic networks • Diversified income sources and production systems • Use of adaptive agricultural practices and technology that are adapted to stressors, and adaptable • Household asset base and access to food 	<ul style="list-style-type: none"> • Diversity of products and market channels • Redundancy of multiple buyers, sellers, service providers • Trusting relationships allowing cooperation, communication flows, innovation and learning • Market governance (transparency, fairness, consistency) • Predictable, supportive policy environment

To evaluate how RWANU market system interventions impacted access to food for men and women, the study adopted the World Food Program's (WFP) definition of food security: "People are considered food secure when they have availability and adequate access at all times to sufficient, safe, nutritious food to maintain a healthy and active life".⁶

⁴USAID 2013: USAID technical note_ Measuring Resilience 2013 PDF.

⁵Ruth Campbell, November 25, 2014: Market Systems and Resilience. Power Point Presentation ACDI/VOCA Leveraging Economic Opportunities (LEO)

⁶<https://www.wfp.org/node/359289>

The team used a mixed methods approach that was largely qualitative but drew on quantitative data as appropriate; and incorporated both secondary and primary research. The analyses integrated qualitative and quantitative data to triangulate and achieve complementary perspectives from both approaches. This allowed the team to ascertain what changes, if any, have occurred and understand the experiences and processes underlying these changes.^{7,8} Methods included the Most Significant Change technique, used to capture changes in resilience at household and market system levels, household food availability, and nutrition tied to RWANU project interventions.

2.2.SAMPLING

The study covered eight purposively selected sub-counties out of the 16 project sub-counties in the project's target districts of Moroto, Napak, Nakapiripiriti and Amudat (Figure 1). Purposive selection of the study sub-counties took into consideration geographical spread, socio-economic aspects and coverage of both the green belts and drier areas. The sample comprised of 4 sub-counties in the green belt and 4 sub-counties from the drier parts (Table 2.2).

Table 2.2: Summary of sampled sub-counties and groups by district

District	Green Belt		Dry area	
	Sub-county	No of groups	Sub-county	No of groups
Nakapiripiriti	Namalu	3	Moruita	2
			Lorengedwat	1
Napak	Lorengchora	2	Lotome	2
	Iriiri	1		
Amudat	Karita	2		
Moroto			Nudugent	4
Total number	4	8	4	9

Figure 1: Study locations

⁷Pereznieta, P. and Taylor, G. (2014) 'A Review of Approaches and Methods to Measure Economic Empowerment of Women and Girls', *Gender & Development*,

⁸Melody Mentz 2017: The benefits of both worlds: Towards an integrated mixed-methods approach for evaluating women's empowerment

The team selected 17 farmer groups (six in Nakapiripriti, five in Napaka, four in Moroto and two in Amudat), for the focus group interviews. Out of the 17 groups, eight were in the green belt and nine from the drier areas. Group selection ensured coverage of the various market system interventions and representation of groups that had accessed one to two market interventions as well as those that had accessed more than two interventions. The sample included 10 groups involved in Accumulated Savings and Credit Associations (ASCAs), six block farm groups, six groups that benefited from business development grants and support to youth and women, five groups engaged in bulk grain marketing, five women's livestock groups (WLG), and three beekeeping groups. Details on the sampled groups, number of interventions accessed, their sub-counties and districts are provided in Annex 2.

The team gathered secondary and primary data between May 2nd and 24th 2017. As noted, the study employed a diversity of techniques to gather information from secondary and primary sources and engaged a wide range of stakeholders at different levels in a participatory way.

Primary data came from 18 focus group discussions (FGDs) and 12 in-depth interviews with beneficiary farmers, seven⁹ key informant interviews with district local government staff and leaders; 22 value chain actor interviews (five¹⁰ private agro-dealers, six Community-based Animal Health Workers/CAHWs, three tillage

¹⁰ 4 supported by RWANU and 1 supported by the Millennium Dry Lands Project but providing services to project beneficiaries

service providers, four buyers, three financial service providers, and one national seed company). The list of groups where FGDs were conducted and their locations is in Annex 2, while the list of key informant interview (KII) and value chain actors is in Annex 3. The team also collected data through physical observation at farmers' and other value chain actors' premises, consultations with project implementers, and informal interviews with produce and livestock traders and project beneficiaries during a visit to Kangole periodic market.

In addition, the field team collected anthropometric data from a total of 121 children under five years—weight, height, age, and Middle Upper Arm Circumference (MUAC)—with the assistance of the RWANU project team.

2.4. DATA ANALYSIS

As noted, the team used both qualitative and quantitative methods. The qualitative data obtained from the focused group discussions, key informant interviews, value chain actor interviews and literature review was subjected to **thematic analysis** of the salient issues to answer the assessment questions. The analysis involved going through all interview transcripts with a view of identifying analytic patterns or themes that could aid interpretation. This was followed by listing down all significant statements as per the research questions and subsequent filtering for non-repetitive and non-overlapping meanings. The team further categorized significant statements into similar 'meaning units' whenever applicable merging some of the statements into larger categories or themes, and secondary level units as sub-themes. The team then used this to write descriptions of what the participants experienced and how the experiences/changes happened.

The team used simple descriptive statistics (means, percentages) to analyze changes in key indicators related to outcomes from the various market models, and change in household food security and nutrition levels. Findings from qualitative techniques were merged with results from quantitative data for triangulation and aiding interpretation and explanations for identified convergences and divergences.

3. SAVINGS AND CREDIT ACCESS

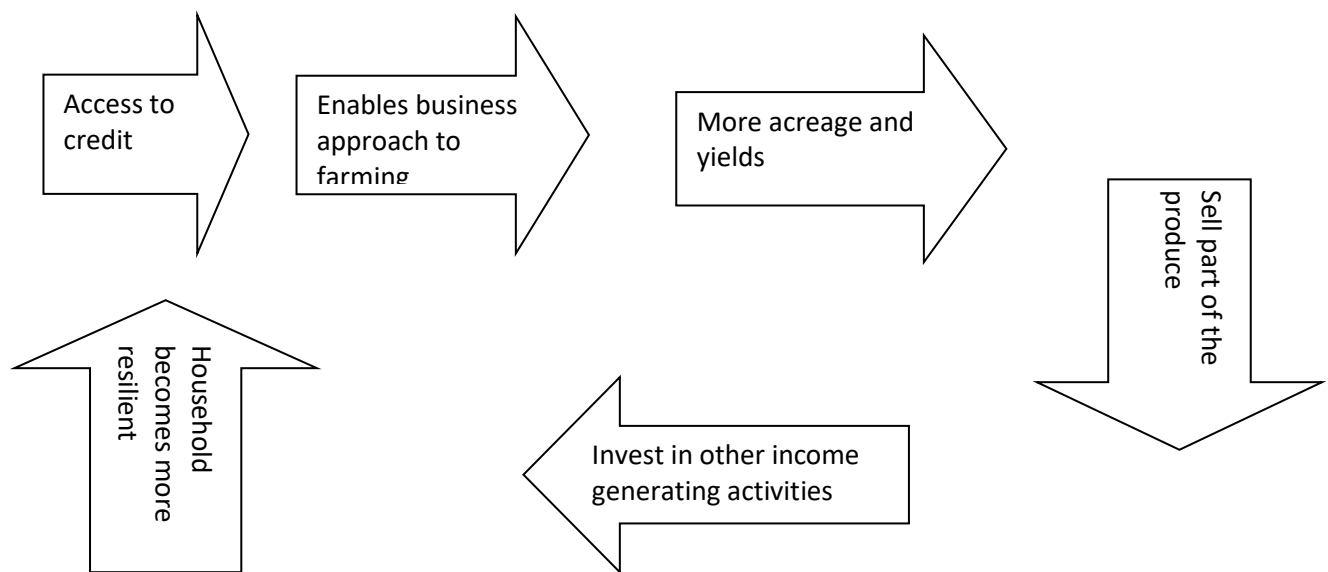
Summary findings: Access to credit has strengthened household resilience. It has enabled consumption smoothening allowing households to solve pressing needs for cash without resorting to selling produce or livestock at low prices. This has positively impacted on household's absorptive capacities. Though this is consumption debt which would potentially make households more vulnerable, by minimizing distress sale of livestock and crop produce until prices improve, the ASCAs have acted as an enabler for the bulking groups and hence increased incomes from the higher prices. In case of livestock this supports wealth accumulation. Households have also used the credit to invest in farming activities notably purchase of improved seeds, hiring tractor tillage services for increasing acreage, and drugs for treating and spraying livestock which has increased adaptive capacity of households. The ASCAs have provided capital to support investing and scaling up income generating activities like brewing, produce trade and food vending. This has supported diversifying of household sources of income and spreading of the risks. The ASCAs provide a learning platform to farmers' financial inclusion.

At the output and market levels, access to credit has enabled farmers to appreciate and adapt market approaches to enhance their livelihoods. As reflected in Figure 2, RWANU beneficiaries have adopted a business approach to farming and have learnt to expand their production by increasing the sizes of their farmland, part of which is to produce food for household consumption and the rest for sale to the market. In the Chyomwogh group in Karita sub-county for instance members reserve between one quarter to half of their farm produce for sale in the market which they in turn invest in other income generating activities such as buying and selling of vegetables and small retail kiosks. A host of organizations are involved in capacity building of the groups on savings and credit associations.

Access to credit has built capacity of beneficiaries to be active market players through engagement in micro-enterprises that enable them to build the requisite assets to withstand future shocks. RWANU beneficiaries have acquired knowledge on financial management and available financial services. They have started forming umbrella organizations such as Kopopwa SACCO which position them to take advantage of available market opportunities.

Weak links between the ASCAs with financial service providers, and suppliers of logistical materials; low savings volume coupled with short period groups have engaged in saving are gaps that need to be addressed to strengthen resilience. Future programs should continue to nurture growth of the ASCAs, promote a bank linkage program, engage in advocacy for banks to enhance their outreach services through agency banking; and promote a village agent model among the ASCAs.

Figure 2: Infographic flow of how one intervention leads to other upgrades



3.1. DESCRIPTION OF INTERVENTION AREA

RWANU recognized access to credit as a major driver of farmers' engagements in the mainstream economy. Through an M & E baseline, the project established benchmarks against which to gauge performance. RWANU envisaged that by the end of the intervention, it would support the formation of 569 savings and credit groups to be supported with skills, systems and facilities for group savings and credit. The resulting groups included 30 in Amudat, 18 in Moroto, 285 in Nakapiripirit and 236 in Napak. This section highlights the project's performance in terms of outreach and transitions in the lives of members and the market systems in which they operate.

RWANU identified groups of farmers with an expressed need for credit to boost their enterprises and provided them with capacity building in form of training. Training sessions covered topics such as savings, loan management, group cohesion and how to identify microenterprises. When the group was ready to start their operations as an ASCA, RWANU provided a full saving kit comprising a metallic savings box, passbooks, ledger keeper and other stationery. Typically, a ASCA or Village Savings and Loan Association (VSLA) comprises 15-30 self-selected members who pool their meagre resources together and lend among members to boost their businesses. Borrowers pay interest on loans, which increases members' profits at the end of the cycle when they share out. RWANU also supported the formation of Savings and Credit Cooperatives (SACCOs) which

comprise much bigger numbers. A group of ASCAs may form a SACCO. By end of 2015, RWANU had successfully converted three ASCAs into a SACCO.¹¹ RWANU also trained 367 program participants on the importance and advantages of elevation into Savings and Credit Cooperatives. In 2016, the ASCAs were able to cumulatively save UGX 134,146,300 (USD 38,228) from a beneficiary membership of 2,192 participants.

RWANU has made several inroads since its establishment. In the 2016 RWANU annual report, members reported that their weekly savings averaged only 1500 UGX before RWANU but increased to an average of 5,000 UGX after RWANU provided training and other capacity building activities. Also before RWANU only one to two children of school age per family were going to school because of lack of financial resources. Following RWANU's implementation of its ASCA approach, more than eight children of school age per family are going to school.¹²

3.2. IMPACT OF SAVINGS AND CREDIT ACCESS ON HOUSEHOLD RESILIENCE

3.2.1. ACCESS TO PROFITABLE OUTPUT MARKETS, AFFORDABLE INPUTS AND SERVICES, EXTENSION, AND AFFORDABLE CREDIT

Access to credit has enabled farmers invest in profitable ventures with better output and reduced the extent to which farmers are exposed to recurrent food shortages in their families. Respondents in the ToTo ASCA group in Namalu acknowledged how they used to sell food to earn money to meet household emergencies such as school fees and medical care that would expose them to additional food insecurity challenges. However, with access to savings and credit services under RWANU, they can now have an alternative source of finance through savings invested in small scale enterprises to meet the same needs while they anticipate future incomes.

This intervention area has given households access to affordable credit which helps smooth consumption and minimize distress sale of produce and livestock. This is because it enables households to hold on to their produce for longer until they can access better output market in which they are able to sell and get better profits. Some farmers have been able to use loans from ASCAs to bulk produce during harvest season and wait to sell during scarcity. Namalera group in Komaret village in Moruita parish for instance has realized the value of credit in helping them holding on to their produce for at least 4 months before selling it and the money is added to their savings box for members to borrow from. This helps members get more profits as well as improve the liquidity of their ASCA. It is adaptive through acceptance of behavioral change in holding on to one's assets and at the same time it is absorptive because one is able to deal with a shock, that is, the cash problem.

Increased ability to meet cash obligations as you can access credit from welfare fund for emergencies like when child is sick or main ASCA fund to pay schools fees, go for a journey or invest in farming. You do not have to sell your produce when you need money for fees or an immediate journey, just borrow from the ASCA. Able to hold on to produce and sell later hence get higher prices which leads to increased incomes. Get money for plowing and pay latter. I have borrowed twice UGX 500,000 (USD 140.8) in 2016 and 400,000 (USD 112.67) in 2015 and each time used the money to hire tractor services for plowing hence opening large acreage for crop production. (Teddy Akol from Lokana Farmers Group Namalu sub-county Nakapiripiriti district).

¹¹ RWANU Year 2016 Annual Results Report

¹² RWANU Year 2016 Annual Results Report

RWANU has enhanced a saving culture with in communities and access to finance (Views District Commercial Officer).

In 2016 I borrowed UGX 300,000 (USD 84.5) from the ASCA and I used part of the money to buy seeds. This has enabled me to plant improved seed for maize, cabbage and water melon (Celina Chepchock Compas, Karita Amudat district).

The ASCA loans are a reliable source of credit, are more structured and payment terms are clearer compared to usury lending schemes from money lenders that made members more vulnerable to debt in times of emergencies. The ToTo ASCA in Namalu maintains a welfare fund that is borrowed interest free and for a very short-term, typically one month specifically to meet members' emergency needs. In so doing, food stocks are not depleted as fast as before thus helping households cope better with shocks whenever they occur. Also by getting farmers more familiar with structured borrowing it helps prepare them for access to future bank loans and to understand the terms and conditions better, hence become more adaptive to financial services and institutions.

Through credit access, RWANU has enabled farmers to afford quality inputs and tillage services which helped increase the size of their acreage thus contributing to their adaptive capacities through acquisition of better varieties of crops and animals. Lokona farmers group in Nakayoth village in Namalu Sub County was able to borrow UGX 300,000 (USD 84.5) from their ASCA and use as 30 per cent of their contribution to hire a tractor to plough their block farm. Similarly, members of Chyomwogh Farmers' Group now believe in buying quality seeds from Ribo Agro Input dealer or from Donato which guarantees higher rates of germination as well as better yields.

3.2.2. WOMEN'S PARTICIPATION IN DECISION-MAKING, INCOME GENERATION AND INCOME ALLOCATION

During the focus group discussions (FGD), 89 percent (8/9) of women in Namalera group, Moruita Sub County, all of the women in Thende group in Lotome, and all of the women attending the Kikangai focus group discussion stated that, prior RWANU's introduction of ASCAs, women could not make important decision over important issues in the household such as handling household expenditure. FGD participants noted that women can now decide on how they use their incomes, generated from ASCA-supported enterprises. Women FGD participants also noted that spouses respect them even more nowadays and they can decide together on how their money can be used. It has also boosted women's economic activities like brewing as they can now borrow from the group and scale up their production. All these are because the intervention has given women more dignity and a level of respect that they didn't have before.

Access to savings and credit was instrumental in linking up women in particular to new market opportunities that were previously difficult to engage in, such as buying and selling animals. The diversified income source helps members weather the shocks, for instance, fewer women from Kanakomol Enterprises group in Nadunget nowadays borrow from family and friends unlike before.

Money has empowered us. We do not have to keep begging our husbands for everything. We borrow from the ASCA and invest in petty business notably brewing. (Kitorosi WLG, Naduget Moroto).

The women in VSLAs (ASCAs) have raised the pride of women. The VSLA (ASCA) has given them control of assets in the homes and self-esteem. Widows have increased the capacity to provide for their households. Women in VSLAs open small business and do livestock trading (Views of the District Commercial Officer).

3.2.3. SOCIAL AND ECONOMIC NETWORKS

Access to credit through ASCAs has built the social capital of group members who have been able to build strong bonds of solidarity with each other where mutual lending and savings take place. These have been reliable sources of income for investment and other welfare. For instance, women in Chyomwogh group, Karita sub-county agree that coming together in an ASCA helped them reflect together on their common problems as women, which is a bonding social capital. The groups have also gained bridging social capital by aggregating and merging into SACCOs to facilitate access to better opportunities and a common bargaining power over other actors. Kopopwa SACCO in Lorengechora Sub County for example comprises a group of ASCA who have come together under one umbrella to give members access to more capital and other services. Since this new formation, the SACCO has gained linking social capital in form of recognition from Napak District Commercial Officer who now sees it as a model for community organizations in the district. Establishment of linkages with District Commercial Officers provided a foundation for sustainable access to information and guidance on governance which would not be available to groups. This enables groups to benefit from the linking social capital.

Some of the ASCAs have transformed their social networks as a farmers' group into economic networks by starting joint businesses including cereal bulking as in the case of Kitongoethe group in Iriiri who used income from their ASCA to buy and bulk sorghum in October 2016, selling it at a profit of more than 100 per cent in April 2017.

'For long I have been looking for successful groups in the district but when I came across Kopopwa SACCO, I was very impressed by what the members are doing. Moreso, the majority of its members are women and I think that is why they are so organized and successful' (Views of a District Commercial Officer).

Before RWANU you would only borrow from a friend or neighbor but this would lead to conflicts and fights because repayment terms were not clear. But with ASCA, one is certain of when they need to repay and it is more accessible. You can borrow more money than what you get from an individual (Nabokat, Kamaturu, Lorengedwat, Nakapiripiriti).

3.2.4. DIVERSIFIED INCOME SOURCES AND PRODUCTION SYSTEMS

ASCAs have facilitated access to credit that beneficiaries invest in different economic activities such as buying and selling produce, marketing livestock or brewing and selling local brew. FGD participants reported investing in various income-generating activities. In the ToTo ASCA group Namalu, all members agreed they were able to engage in at least one petty trade. The majority of members present (20 out of the 22) said they were able to use credit from the ASCA to scale up their businesses. Seven members have been able to invest in buying and selling of grains to take advantage of good prices during lean seasons something they had never known before. All 8 FGD participants in Kitorosi WLG, Nadunget, Moroto reported that they had used the credit from ASCAs to scale up their income generating activities. FGD participants in Kanakomowl in Nadugent Moroto and Chyowogh FG in Karita Amudata, noted that they invest credit from ASCAs in petty business which has increased their ability to withstand and respond to stressors like droughts. Access to credit has enabled farmers to buy seeds of resilient varieties and crops that they were not planting before. This has diversified their production systems.

'Before we started the ASCAs (under RWANU), one had to look for firewood or burn charcoal to be able to get money to buy sorghum or maize to brew. Life was hard as the brewing was not regular. You would take long going to the bush to cut firewood only to return back and find children have nothing to eat. The men would not support those days in foraging for food. But now, I have brewed 5 times in one and a half

months compared to the past when I would do it only once' (Female member: Kitorosi women's livestock group, Nadunget, Moroto).

Incomes from petty business we get from ASCA loans enabled us to withstand and respond to effects of the drought. This has greatly helped. Before RWANU we would depend on casual labour, washing clothes in hotels in Moroto town, selling firewood but we do not have to do this now (Kanakomowl Livestock trading group, Nadugent Moroto).

I used the ASCA loan to buy maize hybrid seed, and seeds for cabbages and water melon which I was not growing before (Celina Chepchock, Chomwogh FG, Compas, Karita Amudat).

3.2.5. USE OF AGRICULTURAL PRACTICES AND TECHNOLOGY THAT ARE ADAPTED TO STRESSORS, AND ADAPTABLE

Access to credit has enabled farmers to use resilient varieties that are suitable for the area. Likewise accessing credit has enabled households to hire tillage services allowing farmers to adopt timely land preparation and timely planting which enhance utilization of short rains. For instance, members of Lokona Farmers' Group in Namalu used credit to acquire modern and efficient technology such as the hiring of a tractor for land opening, better agronomic practices including purchase of quality seed varieties such as the Longe 5 maize brand that is drought-tolerant and matures in about 115 days, and increased acreage per household. These practices have enabled them to produce higher outputs that shields them from negative effects of lean seasons.

3.2.6. HOUSEHOLD ASSET BASE AND ACCESS TO FOOD

Access to credit enables households to protect and accumulate assets such as livestock that help families to withstand effects of shocks and stressors like droughts whenever they occur. One farmer by name of Chepolukumo from Namalera group in Moruita Sub County says she took a loan from her local ASCA and bought two cows. These cows have continued to give the family some milk and they hope to sell it one day when prices are higher and invest the money in other income-generating activities. ASCA loans also helped some farmers avoid distress sale of their animals thereby contributing to wealth accumulation as the animals multiply, as portrayed in the following narrative:

Access to credit provides income for consumption smoothing at household level. FGD participants reported that they had borrowed money from ASCAs to buy food for home use. Muita Joseph of Kitongoethe took a loan of UGX 300,000 (USD 84.5) from his local ASCA and bought a bull which he added to one he already had to form pair of oxen. He had an old ox-plough which he was able to put to use. With these, he is able to cultivate more land and produce enough food for his family. Occasionally, he hires out the oxen to plough other people's fields which fetches him extra cash. With these assets, he feels more food secure than before.

The group (ASCA) has been my savior. Last year my son was sent away from school because of non-payment of tuition fees and my only option would have been to sell off my only two goats I was trying to multiply. However, I took a loan from the ASCA and paid the tuition and as we talk now I have 4 goats and generally feel better off (Lonyadia Alelia, Moruita, Nakapiripiriti).

Borrowed 300,000 (USD 84.5) and used part of it to buy 5 goats, the goats give me milk and I can sell in case of shortages (Celina chepchock, Compas, Karita, Amudat).

Borrow from ASCA and use profits to buy assets like goats which will be sold to earn income for food in future because goats multiply very quickly (Lokungiriti WLG Lorengechora Napak, and ToTo ASCA Namalu, Nakapiripiriti).

I used the savings I got from the ASCA to buy 4 chicken (Catherine Marang, Lokungurit WLG, Lorengechora Napak).

We borrowed money from ASCA to buy food for domestic use (Lokungirit WLG in Lorengechora Napak, Chomwogh in Karita Amudat, Namalera in Mourita Nakapiripiriti).

3.3. IMPACT ON SAVINGS AND CREDIT ACCESS DEVELOPMENT MARKET RESILIENCE

3.3.1. DIVERSITY OF RELATED PRODUCTS AND DIVERSE MARKET CHANNELS

Access to savings and credit was instrumental in linking groups to new market opportunities and products to generate income that were previously difficult to engage in, such as trading produce and animals. As noted in the case of Kitongoethe FG in Iriiri started a gain bulking business using ASCA funds and Kanakomowl Enterprise group in Nadunget started cattle trading using ASCA money. In case of Kopopwa farmers built on their experience in the ASCAs to federate together and form a SACCO, whose membership is bigger and accords its members access to bigger loan products than was possible previously.

Although the diversity in market channels did not come out conspicuously in the interviews, members in ASCA groups now have three financial products; the savings, loans and welfare fund which help farmers with a variety of options in addressing their needs. Centenary bank has a group loan product, while Microfinance Support Centre (MFSC) has loan products for VSLAs/ASCAs and the SACCOs which members of RWANU beneficiary groups could take advantage of. This shows there is a growing opportunity for linkage between the groups and these financial service providers. Centenary Bank already has a group savings product which attracts interest from which farmers can benefit.

3.3.2. REDUNDANCY OF MULTIPLE BUYERS, SELLERS AND SERVICE PROVIDERS

Research indicates that one of the negative outcomes of microcredit for low-income people is often in the form of market saturation, as several beneficiaries tend to invest in similar microenterprises and thus fail to realize benefits of market participation. This is what Bateman refers to as the ‘fallacy of composition’.¹³ Findings indicate significant outcomes regarding the redundancy of financial service providers although there was not much on buyers and sellers. Since RWANU’s intervention, there has been an increase in the number of financial service providers operating in South Karamoja during the project life, from only one Stanbic Bank branch in 2012, to three commercial banks operating in the area (Stanbic, Centenary Rural Development Bank (CERUDEB), and Post Bank which is soon opening its doors) and the Microfinance Support Center Limited, a Government of Uganda Owned company with mandate to provide loans to Savings and Credit Associations (SACCOs and VSLAs/ASCAs).

The project linked the ASCAs and SACCOs to MFSC and CERUDEB. Some of the ASCAs opened bank accounts with CERUDEB, code named VSLA center, which enables them to earn interest from savings deposited in the bank. MFSC and CERUDEB have provided capacity building to some of the ASCAs strengthened by RWANU. MFSC also assessed eligibility of the ASCAs to access loans from them; for instance, 7 groups from Nakapiripirit were found to be qualifying for MFSC loans following preliminary assessment. These linkages provide a strong foundation for future access to capacity building services and access to loans for the ASCAs and SACCOs established/strengthened with support of RWANU. The links to commercial officers who are responsible for supervising activities of the MFSC in their respective districts and as well as those of the SACCOs provide an avenue that would facilitate information flows between SACCOs and MFSC. The commercial officers are expected to attend SACCO Annual General Meetings.

¹³Bateman. M; 2010: Why doesn’t micro-finance work? The destructive ruse of local neoliberalism. Zed Books Ltd

All banks in the area claim to do capacity building for the groups through Training of Trainer (ToT) courses yet the effect of their activities was not conspicuous among farmers. This indicated that there was no clear linkage between service providers and users which brings about redundancy. Centenary Bank conducted 2 ToTs in each district of the project area, MFSC and Mercy Corps are conducting trainings for groups in the four RWANU districts of operation and the Government of Uganda is also rolling out the Project for Financial Inclusion in Rural Areas (PROFIRA) model but all these are not well coordinated.

Access to credit has empowered bulking groups and households to hold on to their crops and demand for better prices from buyers of agricultural produce. Details on this are provided in chapter 6 section 6.2.1. No evidence was captured in this study on how access to credit has impacted on sellers.

3.3.3. TRUSTING RELATIONSHIPS THAT ALLOW COOPERATION, COMMUNICATION, LEARNING AND INNOVATION

One of the benefits of being in an ASCA is access to social networks and working in partnership with others to find a solution to common challenges of poverty. However, the level of communication between financial institutions and the RWANU groups is still not good enough. MFSC and Centenary Bank are conducting trainings targeting farmers' groups for capacity building but most RWANU groups are not yet aware of it. Besides, there is still low trust between some government officials and farmers' groups which make it a little difficult for groups to be linked to vital services. For instance, according to officials of MFSC, seven RWANU groups in Nakapiripirit were vetted for MFSC loans and found to qualify but only needed a certified copy of their certificate of registration from the district as part of the requirement. However, this linkage failed simply because the Community Development Officer had reservations about the group's strength and character, a clear indication of existing lack of trust among market actors.

3.3.4. MARKET GOVERNANCE AND POLICY ENVIRONMENT CHARACTERIZED BY TRANSPARENCY, EQUITY AND CONSISTENCY

Uganda's financial sector is liberalized based on a free enterprise principle. RWANU supported the formation of several savings and credit groups as an entry point for other livelihood interventions. Some of the groups have since graduated to form SACCOs, for instance, Kopopwa Farmers' SACCO graduated from a group of ASCAs to form a big SACCO in Lorengechora with 113 members in order to recoup the benefits of being in a large group. There is a high level of transparency in ASCAs. Each ASCA group determines its own interest rates and interest generated is usually shared by members at the end of the savings cycle. The SACCO on the other hand is registered with the district but members do not have much say in its day-to-day running, a mandate that is entrusted to the management committee. At national level, most decisions regarding affairs of the SACCOs are taken by the Government through the Directorate of Cooperatives in the Ministry of Finance, Planning and Economic Development while at district level; its operations are overseen by the District Commercial Officer.

3.4. GAPS AND REQUIRED ACTIONS TO STRENGTHEN RESILIENCE AND SUSTAIN OUTCOMES

Links between ASCAs and financial service providers are still weak. For instance, CERUDEB has six ToTs (two for each of the three program districts of Moroto, Napak and Nakapiripirit), who are expected to train groups on financial literacy and create awareness on existing bank products. However the bank has not been linked with any of the ASCAs save for those that opened accounts. Likewise not all ASCAs have been linked to MFSC. Future programs should facilitate linkages between all the ASCAs and the financial service providers. Besides, banks are still few and mainly based in Moroto town. Future programs should promote a bank linkage program and engage in advocacy for banks to enhance their outreach services through agency banking.

Other limitations are low savings volume coupled with the short period groups have engaged in saving limiting access to loan products from financial service providers. Low saving volume was attributed to small share value, and limited appreciation of saving among most farmers. One of the gaps that remain is that despite RWANU support to ASCAs, some groups have not yet reached the level of accessing loans from banks. However, experience has shown that banks are willing to lend to groups if the model is right and with the appropriate terms and conditions in place.

Additionally, there is limited support from relevant local government offices: RWANU linked 20 ASCAs groups in Nakapiripiriti to MFSC which assessed and found them to qualify to access loans from the center. However, they failed to take advantage of this opportunity because the local government community development officer refused to certify their registration certificate. Groups had to present a certified registration certificate to MFSC as one of the eligibility requirements to access loans. This brings into question local government's willingness to facilitate business' needs. Future programs should engage in advocacy to spur local government officers support to market systems.

There are some weak linkages with suppliers of materials and stationary that support smooth running of ASCA operations. The linkage between ASCAs with service providers for saving kits is weak especially after the end of RWANU program. Future programs should promote a village-agent model among the ASCAs. This would entail supporting the ASCAs to identify an individual who can be trained and will subsequently backstop the ASCAs in accessing items like pass books, stamps, metallic boxes, record books, and other items they need to run their schemes from the suppliers/service providers of logistical materials.

Finally, it cannot be assumed that all ASCAs will graduate into SACCOs as a natural progression because SACCOs are rife with governance challenges such as low transparency and member involvement in the day to day affairs of the cooperative. On the other hand, low volumes in ASCAs make growth and access to adequate funds for bigger investments very difficult despite their better governance structure.

3.5. SUSTAINABILITY

The ASCAs have strengthened farmer capacity to withstand shocks and stressors like family emergencies and effects of climate events like droughts and floods. However, the low saving volumes due to low share value makes it difficult to access larger amounts from the ASCAs. ASCAs are likely to continue beyond the life span of RWANU and members will continue to derive benefits from them. The ASCAs still need some hand holding to ensure that they formally establish functional linkages with the financial service providers and be able to serve as spring boards for their members to access bigger loans for investing in farming and other income generating activities. The SACCOs, though built on a strong foundation, are still young and they still need nurturing to ensure that they enhance odds of survival.

4. BUSINESS DEVELOPMENT SUPPORT TO YOUTH AND WOMEN

Summary findings: Grants helped create employment for the involved youth and women, bring services closer to the people and linked them to providers of other services. The grants and training that preceded then facilitated learning and improving knowledge with regards to how to run a business enterprise. Beneficiary have transferred the skills and used the earnings after sharing to invest in other income generating activities. This positively impacts on their adaptive capacity. The grants have enabled beneficiaries to enter into a higher value added function in the value chains thereby positioning them to earn more. For instance members of Apeded Tyre Mending youth group sold milled rice in Jinja, Kanegu, and Kanamokol livestock trading groups traded even in markets outside the district. Grants have allowed women to venture

into livestock marketing which was not common before. They are learning their trade with mentoring support from the men (Men and women go together in the market to sale the livestock).

Investing proceeds from the grant enterprise into ASCAs has provided more funds for member to borrow. The grants have enhanced social capital with groups sharing information on markets, and benchmarking performance of enterprises engaged in by others. This provides a foundation for learning and innovation thereby positively impacting on their adaptive capacities. Income from grant enterprises used to buy food thereby contributing to household food access and nutrition. However, this impact is limited by the short duration the groups have undertaken the grant supported enterprises and coverage of the grants. The grants diversify income sources and have the potential to strengthen households' ability to withstand effects of shocks and stressors like floods, family emergencies and drought. The groups were trained equipped with business skills training, group dynamics and leadership. The groups visited in this study seemed to be stable and likely to continue beyond RWANU. This notwithstanding individuals taking advantage of other members in the group presents a threat to continued realization of benefits from the grant enterprises. Groups would need to institute clear processes for sharing of benefits from their enterprises. Weak linkage between the RWANU grant groups and other actors; and inability to visualize and take advantage of existing opportunities to further diversify and grow incomes from the grant enterprise are gaps which need to be filled to strengthen resilience.

4.1. DESCRIPTION OF MARKET INTERVENTION

Under this intervention, RWANU provided grants to groups of youth and women and built their capacity to run businesses. RWANU trained groups in business skills, group dynamics and leadership and supported to develop business plans. Some grants used a co-funding arrangement depending on the status of a particular group. Eight women groups were supported in different activities such as milling (in Namalu), cereal bulking (in Namalu and Lokopo) and buying and selling second-hand clothes. The average grant size was UGX 5 million (US\$ 1,507) and group sizes were around 20 members. RWANU linked beneficiaries to sources of equipment and capacity building opportunities. Overall, 28 grants were given to the youth (below aged 35). Out of this, 166 were male and 275 were female. A beneficiary group received a grant money disbursed in phases after receiving assistance in developing business plans. For effective adoption of technology and skills transfer, groups are expected to maintain a relationship with technical contacts. Groups make their own rules or constitutions that govern their activities and ensure equitable sharing of resources.

4.2. IMPACT OF BUSINESS DEVELOPMENT SUPPORT TO YOUTH AND WOMEN ON HOUSEHOLD RESILIENCE

4.2.1. ACCESS TO PROFITABLE OUTPUT MARKETS, AFFORDABLE INPUTS AND SERVICES, EXTENSION, AND AFFORDABLE CREDIT

Grants provided farmers with a lump sum of cash to access better output markets and enabled farmers to participate in the higher nodes along the market value chain beyond being producers. For instance, the Nadunget Livestock Trading Group was able to venture into livestock markets with better prices by trading in cattle as far as Ocorimongin along the border of Karamoja and Teso after receiving the RWANU grant. Grant beneficiaries took on roles higher in the value chain and improved their performance (process upgrading).¹⁴ The Apeded group for instance produced rice, took it for milling in Jinja and sold close to the consumers thus

¹⁴ Entry into new function in the value chain, and improving operations, marketing, etc.

getting themselves a better price. They also underwent channel upgrading¹⁵ in moving to a higher-value market.

Apart from one female member of Apeded Tyre Mending group who used shared profits from the grant enterprise to buy inputs for crop production, no other evidence was captured during this study on how the grants impacted on access to inputs and services and extension. This could stem from the short period groups have implemented the grants, limiting the number of times they have shared profits for individual use. At the group level Apeded Tyre Mending used the part of the proceeds to buy rice seeds and access tillage services to plow seven acres, having increased from four acres planted last year.

With regards to access to affordable credit, two of the five sampled groups (Chyomwogh FG in Karita Amudat, and Kanakomowl Youth Enterprise group in Nadugent Moroto) invested proceeds from the grant enterprise into their ASCAs for members to borrow. This enhanced access to credit.

4.2.2. WOMEN'S PARTICIPATION IN DECISION-MAKING, INCOME GENERATION AND INCOME ALLOCATION

Most women stated that, in the past, it was not possible for them to make decisions on matters such as how to spend household income or even participate in major income generating activities. It was known to them that, as Karimojong, a woman's position is clearly restricted to certain confines. At the group level under RWANU, women participate in the livestock market by accompanying the sellers to the market as it was in Kanamokol group. With business grants from RWANU, the women are now not only engaged in income-generating activities but also make major decisions on how their income can be spent. This is because they feel more empowered and are full of confidence. Below are testimonies and stories from three members from Kanakomol village in Nadunget where the group invests proceeds from the grant enterprise into the ASCA for members to borrow.

Susan: RWANU has benefited me a lot. You can tell from the way I am dressed, including my child, that there is change in my life. First I invested in trading in chicken using a loan from the group. I also started buying and roasting meat around bars in town. With all these sources of income, I support buying of food in the household, including essentials such as salt, sugar and soap.

Lucia Lolem: Previously, used to rely on her own personal labor to till the farm. But nowadays with access to the group grant, she hires oxen to plough larger acreage and this has boosted her production output. She cultivates sorghum, sells part of it and buys maize for domestic consumption. She uses the rest of the money for making local brew which earns her extra income. Her husband is a butcher and appreciates the contribution she is making to the household.

Philip Achia: In Philip's case, one of his most memorable moments was when a strange disease hit his community killing many animals. He was able to rescue his animals by borrowing money from the group's grant which he used to vaccinate his animals.

4.2.3. SOCIAL AND ECONOMIC NETWORKS

One of the benefits of RWANU's grants to women and youth is getting people to work in organized groups. These groups have gone on to form useful networks from which they have benefitted socially and economically. Groups share market information and make inquiries to understand operations of the enterprises other groups are engaged in. The sharing of information between Kangai and Kanamokol helped with social and economic networks and improved their learning. This kind of interaction helps them to

¹⁵ Entry into a marketing channel that leads to a new end market in the value chain. For instance, going from selling in the local market to selling in the district or larger cities.

benchmark each other and find out best options on the market and ensures the group gets optimum prices for their produce whenever they have to sell.

We trade livestock as a group. We assign roles to those who go to buy the cows, those who look after the cows before reselling and those who go to look for the market. Distribution of roles is shared equally between men and women (2 women and 2 men). The women just go to witness (Chyomwogh FG, Compas, Karita, Amudat).

4.2.4. DIVERSIFIED INCOME SOURCES AND PRODUCTION SYSTEMS

Business support grants improved household resilience by enabling youth and women to make viable investment in income-generating activities that help households accumulate assets and meet basic needs. For example, the Apeded Tire Mending and Metal Fabrication Youth Group (four women and seven men) received a grant of UGX 4,620,000 (USD 1,282) from RWANU. They invested this in rice growing, choosing a high-value crop, and group members were able to enjoy healthy profits upon harvest. Some members used this money to pay school fees while others used it to buy foodstuff for home consumption. The group's level of organization also attracted additional funding of UGX 8,650,000 (USD \$2,400) from the government's Youth Livelihood Fund as a revolving grant which they used for setting up the metal workshop in October 2015.

The extra income received by members after obtaining the grant is invested in microenterprises and this helps buttress them against different shocks. For instance, in Apeded Tyre Mending and Metal Fabrication Youth Group the women went in to food vending upon sharing profits from the grant enterprise. This was a coping mechanism during the drought. The groups have engaged in income generating activities they were not doing before and sharing profits allows the households to access income from an additional source. Similarly, Kingangai Youth Bakery was able to engage in bread baking, something they had no prior experience in. This eventually saw them positioning themselves as the leading bakery in Nadunget. Kanegu Livestock group also began engaging in animal trading, sometimes going as far as Ocoromongi after receiving the grant. The following are further testimonies from grants recipients:

We received training on how to start a business, run a group enterprise (with two group members sent to Matany for a governance and financial management course) before we could receive the grant. This grant has increased our income options (Kigagai youth bakery group, Katanga, Nadunget Moroto) .

We invested the grant into a produce bulking center. Group buys produce and sells buyers from Kenya and also to community members during times of scarcity. We started in February when there was no food in the area so currently selling to farmers for food. The group members also sale their produce to the group. Group gets a profit margin of 15% on produce sales. Proceeds invested in the ASCA for members to brow more (ToTo ASCA Namalu).

Another group, ToTo ASCA in Namalu has also been able to diversify their income by opening a bulking store at Namalu market, with a monthly rent of UGX 25,000 (USD 6.9) which they have already paid upfront for the entire year.

4.2.5. USE OF AGRICULTURAL PRACTICES AND TECHNOLOGY THAT ARE ADAPTED TO STRESSORS, AND ADAPTABLE

The grant from RWANU was instrumental in enabling beneficiaries to adopt improved agricultural practices that had a direct impact on their ability to improve their yields and thus more food availability. For instance, a member of Apeded Tyre Mending and Metal Fabrication Youth Group used the shared money to buy drought tolerant and quick maturing maize varieties which led to realization of higher output. For ToTo ASCA in Namalu, RWANU grant was instrumental for the adoption of animal traction as a key input in their farming that enabled members open up larger portions of farmland for cultivation making them realize larger harvests and the need to have a bulking store. In Kitongoethe group, members also used their grant to acquire improved maize seed variety Longe 5 which is known to be drought resistant and suitable to their soils.



Members of ToTo ASCA in their bulking store in Namalu

4.2.6. HOUSEHOLD ASSET BASE AND ACCESS TO FOOD

The grant also had a direct impact on food consumption at the household level. FGD participants noted that they use the proceeds from grant enterprise to buy food. Member of Kigangai Youth group also reported using profits from the enterprise to buy food. Similar testimonies from groups that received grants from RWANU can be seen below. No evidence of grants impacting on household asset base was captured in this study.

Profits from group enterprise, we share and buy food (Kanakomol Livestock trading group, Naduget Moroto).

Diversified sources of income: Nowadays we buy sorghum after selling cows and store to wait for the lean seasons. We store in the granary (Kanegu, Nadunget Moroto).

I used to feed on residues for local beer, but now I can afford maize flour, meat and other items (Male member of Kigagai youth bakery group).

Now get 3 meals a day. Before I used to sleep hungry (Male member of Kigagai youth bakery group).

We trade livestock as a group. If we get a profit we save some as a group and share the rest equally. So far we have shared once (Chomugh FG, Compas, Karita, Amudat).

4.3. IMPACT OF BUSINESS DEVELOPMENT SUPPORT TO YOUTH AND WOMEN ON MARKET RESILIENCE

4.3.1. DIVERSITY OF RELATED PRODUCTS AND DIVERSE MARKET CHANNELS

RWANU's had a multi-pronged approach enabled beneficiaries to diversify their investments and ultimately made them able to cope with and absorb market-induced shocks. Training groups on how to manage a group enterprise and record keeping strengthened their ability to run new business enterprises and increase their participation in the marketplace. The grants enabled groups not only to engage in enterprises they were not involved in before, but to upgrade their participation in value chains. In this regard, Kanomokol Enterprises (Youth Group) started as a saving group in 2013 and ventured into livestock trade in 2016 using a RWANU grant of UGX 6,800,000 (USD 1,894). Likewise Kanegu group in Nadugent, Moroto and Chomwogh FG in Karita, Amudat were also engaged in livestock trade. Apeded Tyre Mending and Metal Fabrication was in engaged in rice production. They mill the rice and sell it in Jinja district. The ToTo ASCA entered into in grain trade. Other groups are engaged in grain milling, grain trade and second hand cloth. The grant group in Lorengechora engaged in grain trade and secondhand cloth sells grain to big buyers as well as other community members. This group also sales clothes in periodic markets as well as through door to door hawking where they either get cash for the cloth or barter it with grain. With multiple sources of income, members found themselves better prepared to withstand decline in market prices of grains like sorghum which they used to rely on. In ToTo ASCA group from Namalu, members received interventions inform of capacity building and a savings kit, a grant to buy oxen and ox-plough, seeds and training in good agronomic practices. These interventions were mutually reinforcing in that credit contributed cash for reinvestment in agriculture while quality seeds and more efficient technology in form of animal traction helped in boosting production output. It was however not clear from the interviews how business support to women and youth led to diverse market channels.

4.3.2. REDUNDANCY OF MULTIPLE BUYERS, SELLERS AND SERVICE PROVIDERS

RWANU's intervention ensured a well-connected market with different actors playing complementary roles. Through linkage to the district commercial officers RWANU ensured that groups will continue to access guidance on running joint business enterprises. Groups were also linked with technical service providers. Groups involved in livestock trade continue to engage with District Veterinary Offices to access movement permits for their animals. Groups engaged in grain milling were linked with suppliers for the machinery and technicians who supported them in installing the mills. Groups maintained a relationship with these technical contacts for purposes of accessing spare parts and repair services. No evidence was captured in this study on how business development to youth and women has impacted on buyers and sellers.

4.3.3. TRUSTING RELATIONSHIPS THAT ALLOW COOPERATION, COMMUNICATION, LEARNING AND INNOVATION

One of RWANU's achievements remains the facilitation of communication and learning between groups. As part of the grant capacity building process, Kanokomol group in Nadunget was trained on how to manage a grant and how to keep records. This was vital in maintaining group cohesion when they eventually received the grant hence improving their ability to weather future market challenges. Similarly, a grant, by its nature being a shared resource has been effective in fostering trust between members. In Kanengu group for instance, members have developed mutual trust and regularly delegate 5 members of the group to take their livestock to sell in the market, receive cash on the group's behalf and are trusted to declare it at the meeting. This was also acknowledged by members of Chomwogh FG in Compas, Karita, Amudat district. The youth in Kikangai group have learned new knowledge and innovation out of the grant they received by starting a bakery in Naitakwai neighborhood in Moroto, an area that had never had that kind of business.

4.3.4. MARKET GOVERNANCE AND POLICY ENVIRONMENT CHARACTERIZED BY TRANSPARENCY, EQUITY AND CONSISTENCY

RWANU groups who have received grants operate according to free-market principles. Kigangai Youth group in Nadunget are engaged in retail hence their activities and market are only regulated by the government. Output markets for the group enterprise are still competitive and remain unrestricted. Groups put in place constitutions and made rules to ensure equitable sharing of benefits. Participants in FGDs acknowledged having received training on how to start a business and run a group enterprise, record keeping, governance and financial management. Groups noted this was instrumental in helping them register with the district and remain as a strong group based on transparent operation and trust. All groups are registered and have a trading licence.

In terms of market control, the group markets their confectionery mainly around Naitakwai neighborhood and Moroto Municipality. They used to concentrate mainly around Naitakwai but ever since they paid the trading license, they realized they could explore other market within the municipality. In town, however, they do not take their merchandise inside the main market on Lia Street for fear of having to pay extra levies so they prefer to do hawking around busy areas in town.

4.3.5. GAPS AND REQUIRED ACTIONS TO STRENGTHEN RESILIENCE

The groups have implemented their enterprises for only a short time, suggesting that the groups are still learning their trade. Most groups had limited experience in using the grants but this was understandable as they had only just received them a few months back. The groups need close follow-up to ensure that members abide by their constitutions when it comes to sharing of benefits and ownership of the enterprises.

There are weak linkages between the RWANU grant groups and other actors, impeding grantees' abilities to take advantage of existing opportunities. Though groups reported that they were trained on proposal development, only Apeded Tyre Mending, which received a revolving credit fund under the Youth Livelihoods Program, did so. Other groups interviewed had not taken advantage of opportunities provide through government program to apply for more funds to grow their enterprises. For instance, the GOU Youth Livelihoods Fund is geared at empowering the target youth to harness their socio-economic potential and increase self-employment opportunities and income levels. The Uganda Women Entrepreneurship Programme (UWEP) avails women groups with interest-free credit to initiate or strengthen their enterprises. At the local government level these programs are under the supervision of the community development officers. Future programs should engage in strengthening capacity of these groups for them to produce proposals and facilitating stronger links with the local government community development officer.

Some groups have lesser abilities to see and take advantage of existing opportunities to diversify incomes than others. Some groups operated in areas where they can use the money to invest in other income-generating activities as opposed to leaving it on the group account. For instance, members of Kanengu Livestock Farmers group cited the absence of retail shops in their community to supply basic household commodities in their entire neighborhoods as one of the challenges they face. The group thus moved in different markets but has not realized that this challenge presents an opportunity in term of business income stream they can take advantage of, and grow their money.

5. CROP AND LIVESTOCK INPUTS AND SERVICE DEVELOPMENT

Summary findings: This market intervention has strengthened household and market system resilience. Impacts at the household level greatly depend on the season, adoption of several technologies and good agronomic practices, as well as a diversity of crops and livestock. These include suitable varieties, increased acreage, good agronomic practices (timely planting, row planting, timely weeding), horticulture production to diversify crops grown, livestock health and management practices. These increase the absorptive and

adaptive capacities of the households to absorb and respond to effects of climate events like drought, floods, and increased prevalence of livestock diseases. The range of crops grown helps to mitigate risk through diversification, while access to livestock inputs has helped to reduce losses, improve herd size and performance hence contributing to wealth creation.

Positioning households to purchase inputs from agro-dealers has enhanced their ability to choose suitable varieties, and ensure sustainable access to information provided by the agro-dealers. This positions the households to access information to support their learning and innovation positively impacting on their adaptive capacities. Belonging to the Farmer Training Groups (FTGs), and Women Livestock Groups (WLGs) has enhanced women's access to training, technologies, and awareness on sources of inputs. Adoptions of suitable varieties, good agronomic practices, and expansion of acreage as a result of increased appreciation of crop production and access to tillage services have triggered increased production. This has consequently increased household access to food, assets, and diversified income sources. Households invest proceeds from increased production into assets that support wealth creation, other income generating activities and buying food stuffs that were not regularly on the menu.

The market system has grown, diversified and gained capacity at the same time. The agro-dealers and community animal health workers have facilitated increased access to inputs, advice, and services. They are a source of advice to farmers which provides a foundation for sustainable access to information, learning and innovation. The partnerships between the agro-dealers and suppliers, and public veterinary service providers and Community-based Animal Health Workers (CAHWs), provide a strong foundation for sustainable farmer access to livestock health services. It is very likely that agro-dealers and CAHWs will continue to provide services to farmers. The dealers that existed before have taken advantage of RWANU to increase their capacities to supply inputs. Farmers have appreciated the improved varieties and are likely to continue to use them with the associated production practices.

5.1. DESCRIPTION OF CROP AND LIVESTOCK INPUTS AND SERVICE DEVELOPMENT INTERVENTION

Crop and livestock inputs and service development interventions were geared at facilitating the adoption of improved smallholder farm (crop) and livestock management practices, as well as establishing a larger and stronger inputs and services sector. Through this intervention area and others, RWANU set out to provide short-term agricultural sector productivity or food security training to 20,633 individuals (including 16,088 producers, 1,500 horticulture farmers, 2,100 goat-rearing group members, 810 honey producers and 135 CAHWs).

Project interventions focused on increasing both demand and supply of crop and livestock inputs and services, to increase output. Activities that focused on crops included establishing demonstration gardens and block farms promoting horticulture and seed vouchers and building capacity for increased food crop production through training workshops, farmer field days, exposure and exchange visits, tours and learning on block farms and demonstration sites.

RWANU used demonstration plots and block farms to trial new crop varieties and train farmers on best agronomical practices. The project developed 177 block farm groups between 2014 and 2016.¹⁶ In 2014, 2015 and 2016, a total of 508¹⁷ demonstration plots were established throughout the four RWANU districts in collaboration with national seed companies and lead farmers. Over 534 lead farmers were trained on management of demonstration plots, best agronomic practices, group dynamics and development, farmer

¹⁶ 57 in 2014, 60 in 2015 and 60 in 2016.

¹⁷ 119 in FY 2016, 112 RWANU supported demo plots in 2015, and 115 seed company supported plots in 2015 and 163 in FY14.

mobilization, and leadership skills. RWANU provided the technologies, training and facilitation for access to inputs through private agro-dealers.

Promotion of the seed voucher system: Prior to the seed voucher system RWANU procured and distributed a total of 33,529 Kg of seed as starter seed kits consisting of a seed variety of a cereal (maize or sorghum) and a legume (beans) to all participating farmers in FY14. During implementation year 4, RWANU introduced a seed voucher system in which farmers bought inputs directly from the agro-dealers after contributing 30% of cash funding while RWANU provided a 70% cost-share. The seed vouchers enabled 1,044 individual farmers (723 female, 321 male) and 43 block farms to access quality seeds. This helped to transition farmers to commercial agriculture operations where they directly buy inputs from agro-dealers as opposed to the donations from government and other actors that producers had often previously relied on to access and plant quality seeds. To complete the transition to normal market systems, RWANU phased out the seed vouchers in October 2016 with beneficiary farmers paying the full market value to access inputs from the agro-dealers. Findings from the program annual reports reveal that 6,279 RWANU farmers, including those from block and individual farms, and 2,462 non-RWANU farmers were linked to input dealers to access improved seeds and other inputs.

Promoting horticulture production: RWANU introduced and demonstrated drip irrigation to 83 farmers (47 male, 36 female) through 11 farmer groups and four model farmers (four males) who received 15 drip irrigation and technical training for their operation and maintenance. All the groups and model farmers received vegetable seeds and training in vegetable production and management. Success of the pilot irrigation demos catalyzed the subsidized sale of 45 irrigation kits to other farmers in 2016 and 2017. A total of 74 individuals (25 Field Extension Workers, 41 health promoters (HPs) and 8 health educators (HEs) were trained as Training of Trainer (TOT) on nursery bed establishment management practices, liquid manure making, pest and disease control in vegetables, and establishment of keyhole gardens. The health promoters cascaded the training through the Mother Care Group (MCG) platform.

Capacity building of beneficiaries for improved food production: RWANU conducted training workshops through which over 1,196 farmers (469 men, 727 women) were trained on best agronomic practices following seasonal calendar. Exchange visits were conducted for 258 members of block farms to share experiences and learn on-site from their host farmer groups.¹⁸ The project also facilitated 24 farmers to participate in other national and regional trade fairs including- National Agriculture and Trade Fair in Rwanda. In 2016 RWANU hosted three farmer field days, one each in the project districts except Moroto where little harvest was realized due to poor rainfall. The event attracted over 900 participants and farmers the opportunity to learn from each other while at the same time interact with potential buyers. The project also co-hosted the first Karamoja Agricultural Trade Fair in October 2015 in Moroto attracting about 30 participants from the private sector, civil society and government and 511 farmers. RWANU facilitated farmers, agro-input dealers, agro-vet dealers and honey producers to showcase their produce and products at the exhibition.

Establishing women livestock groups (WLGs): With regards to spurring access to livestock inputs and services, the project supported establishment of 210 WLGs¹⁹. The WLGs were trained in group dynamics, group leadership, gender and conflict transformation, appropriate practices of goat husbandry and business skills. The trainings were inclusive of the husbands in order to foster support from them to their wives especially with the management of goats. The project distributed a total of 11,940²⁰ goats comprising of 7,384 local does, 4163 Galla does, 302 Galla bucks, and 91 Toggenburg cross-bred bucks to 2323 women²¹ surpassing the program target of 2,100 women.

¹⁸ 18 block farm members from Napak visited Namalu in 2015 and 240 in 2016

¹⁹ 120 in IY1 and IY2, 20 in FY15, 71 in FY16

²⁰ 3028 in IY1 and IY2, 4186 in FY15, and 4726 in FY16

²¹ 1,357 women in IY 1, IY2, and IY3, and 966 in FY16.

Animal service providers: To strengthen provision of veterinary health care services, in FY15 RWANU moved away from direct veterinary services delivery for both pre- and post- distribution of goats to facilitating animal health care service delivery through livestock herd health initiatives that embraced integration of both the public and private sector service. Pre-distribution vaccination and treatment activities were outsourced to qualified private practitioners. RWANU ensured that a CAHW was attached to each WLG to assist in the health management issues as they would arise. The project trained a total of 138 CAHWs (5 female, 133 male) in livestock disease diagnosis and treatment in close collaboration with the private and public sectors. The overall number of CAHWs trained surpassed the program target of training 135 CAHWs but short falls were encountered with regards to number of female CAHWs trained whose target was set at 20.

Agro-dealer development: RWANU supported eight agro dealers with training in business management,²² product knowledge, and output marketing to profitably run their businesses and service farmers' demands in a more sustainable manner. The input dealers were also trained in safe-use and handling of agrochemicals, provided with in-kind grants like shelves, pallets, weighing scales and record books and linked to national seed companies including FICA, Victoria Seeds, Equator Seeds and Pearl Seeds through business talks and discussions organized by the project. The business talks covered modalities of operations including localities of presence, types and amount of seeds required and modalities of payment among others.

5.2. IMPACT ON CROP AND LIVESTOCK INPUTS AND SERVICE DEVELOPMENT ON HOUSEHOLD RESILIENCE

5.2.1. ACCESS TO PROFITABLE OUTPUT MARKETS, AFFORDABLE INPUTS AND SERVICES, EXTENSION, AND AFFORDABLE CREDIT

The contribution of this intervention to access to profitable output markets can be traced through triggering increase in marketable surpluses discussed under subsection 5.2.4 below. Regarding affordable crop inputs and services, farmers have previously predominantly relied on donations from government programs such as Operation Wealth Creation (OWC) and other NGOs to access quality seed. Choice about which variety to plant was hence indirectly made by the agency donating the seed and farmers just had to take it or leave it. Through the seed vouchers, RWANU facilitated linkages between farmers and local agro-dealers, influencing change in behavior by having farmers rely directly on private sector agro-dealers to procure quality seeds of their choice locally. Participants in focus group discussions and in-depth interviews acknowledged buying inputs of their choice notably maize and vegetable seed and to some extent agrochemicals from the agro-dealers. Training through the demonstration sites and workshops, and exposure during farmer field days, trade fairs, exchange visits and tours improved farmers' knowledge on suitable varieties and their ability to choose those most appropriate to their localities. This has positively impacted their absorptive and adaptive capacities. Accessing seeds from private agro-dealers as opposed to waiting for donations from Government and other actors has impacted on timeliness of access and subsequently timely planting.

Improved ability to choose crop varieties most appropriate to their conditions

Improved availability of crop inputs coupled with reduced distance, and cost. Findings from project annual report FY16 reveal that the establishment of local agro-input outlets in the districts has contributed to reducing the cost of travelling long distance to access seeds. Farmers engaged in vegetable production no longer buy vegetable seeds and other inputs from either Mbale (about 215 km) or Soroti (170km), their traditional source of these inputs, as they are now available at the agro-input dealers shops within South

²² The training covered record keeping, customer care management, and business planning (including developing vision and mission, company/organization, business strategy, product/service planning)

Karamoja. Findings from focus group discussions and in-depth interviews with project beneficiaries attest to findings from project annual reports.

I used to buy maize seed from Mbale town 87 km away from my village. Hence I would spend on transport and also lose time, as I had to go in person. If you send people you cannot be certain of what they buy for you and also they can spend the money and start giving you excuses so I had to go. Now I buy the seed from the agro-dealer in Namalu trading centre, which is barely a 1 km from my home I changed from buying maize variety longe 10 to buying hybrid 520 which gives better yields (Teddy Akol from Lokana Farmers Group Namalu sub-county Nakapiripiriti district).

I bought improved maize seed from an agro-input shop in Karita trading centre. Access to quality seed has improved as the shop is now nearer. Before RWANU I did not even know where to find improved seeds, and did not know the importance of using treated seeds. (Chepsangayi Zipola from Mwoto FG, Agule village, Lokaris Parish, Karita Sub-county Amudat district).

I buy my vegetable seeds (tomatoes, carrots, eggplants and onions), maize seed, the chemicals and hand sprayer for spraying the crops from a nearby KABA shop. Before RWANU I was only buying tools like hoes, panga and axe but not other inputs. It was difficult; I could not even know where to go to find them. (Nangiro Racheal horticulture model farmer, Moruita sub-county Nakapiripiriti district).

We buy inputs from Kapchepun Agro-input shop in Moruita. We buy using our group money. They tell us if the quality of seeds is not good we can return it for compensation. We were not farmers before RWANU came to our area. (Lutiama Farmers FGD, Komeret, Moruita Sub-county Nakapiripiriti district).

Access to tillage services has spurred expansion of production units and facilitated timely planting.

The project enhanced farmers' access to tillage services through linking farmers and tractor owners. Project annual report FY16 reveal that seven tillage service providers were added to the list of 12 previously recognized in South Karamoja. The service providers are from Karamoja and neighboring Kenya. Program annual reports reveal that in FY16 a total of 1,051 farmers used tillage services to open 1,320 acres of land while 727 farmers (505 male, 222 female) had accessed tractor hire services and opened 841 acres in FY15. Discussions with two of the 19 tillage service providers revealed that they had provided services to 85 farmers in 2017 opening a total of 315 acres by time of the study in May. Access to tillage services is reported to have contributed to increased acreage for production from 0.25 an acre to 1-2 acres of land especially in the green belt of Nakapiripirit, Napak, and Amudat districts. Tillage service providers revealed that members of block farms have continued to utilize their services but this time as individuals in some instances. Farmers note that access to tillage services has enabled timely land preparation and timely planting. Increasing acreage coupled with timely planting which enables crops not to be caught by dry spells later in season contribute to increased production thereby positively impacting on adaptive capacity of the households.

Tractors have come, can I go back and use my hands for opening land?! Land opening has become easier as I use tractor tillage services unlike before when I was using my hands. This has enabled me to increase acreage under maize and beans from below 0.25 acres before RWANU to 1.5 acres. I plant on time as tractor does not take long to open the land. (Chepsangayi Zipola from Mwoto FG, Agule village, Lokaris Parish, Karita Sub-county Amudat district).

Demand for tractor tillage services is very high, the market is always there. I ploughed 70 acres for four groups which were supported by RWANU. Members who participated in block farms in 2016, have engaged

me this time as individuals to open the same land previously used in a group. I have opened about 75 acres for them in 2017 (Tillage service provide Namalu, Nakapiripiriti).

Access to extension services has improved farmer ability to learn and innovate. Farmer trainings through the demonstration and block farm approaches, training workshops, exposure and exchange visits, farmer field days and trade fairs facilitated farmer access to extension, experience sharing, and cross learning. In addition the private agro-dealers provide advice to farmers on how to plant the seeds and or use the other inputs farmers procure from them. This further facilitates knowledge acquisition on crop production. Farmers noted that knowledge acquisition on farming practices has improved their ability to farm better. This has positively impacted on the ability to learn and innovate thereby providing a foundation for the households to adopt technologies and practices that are adaptable to the stressors.

The proportion of livestock farmers accessing government or private sector veterinary services (disease diagnosis and drugs) and livestock vaccination continued to remain at 100 percent in RWANU's last two years (RWANU 2017). Engagement of livestock owners through combined efforts of CAHWs, private veterinarians and government-led district veterinary services in combination with herd health initiative is noted as a key driver that triggered increased access to and utilization of vet-services. Participants in FGD with members of the WLGs acknowledge accessing vet drugs from qualified private vet drug shops on average 5.5 km away compared to before RWANU when they would buy from hawkers or from a periodic market on average 14 km away.

Although animal diseases are now many, there is also a variety of drugs which I can access from the agro-vet shop or buy in a market day in Karita to manage those diseases unlike before. This has contributed to reduced loss of animals and also they are health hence fetch higher prices (Chepsangayi Zipola from Mwoto FG, Agule village, Lokaris Parish, Karita Sub-county Amudat district).

The agro-vet shop where we buy is 4 km away, compared to before when men had to go to Moroto district town to buy drugs. The journey to Moroto town takes up to 4 hours on foot while it takes just 1 hour to reach the agro-vet shop now. (FGD participants Kitorosi WLG, Nadunget Moroto district).

An agro-vet shop opened in Loregedwat Trading centre in 2016. Previously I was buying drugs from Kangole market 17km away but now its only 2km now. Drugs are available and I have the knowledge on which ones to buy (CAHW and husband to member of a WLG; Loregedwat, Nakapiripiriti).

Focus group participants in three out of the five groups reported getting veterinary services from the CAHWs while members of the other two groups noted that the CAHWs had stopped supporting them and were now relying on friends who had learned from the CAHWs. However, all the six interviewed CAHWs reported that they were still providing the services and will continue to do so even after RWANU, attributing this to acquisition of knowledge and continued demand for services by community members. A CAHW attached to one of the WLGs that reported he had ceased providing services to them with regards to monitoring health status of the goats and spraying for them sometime in 2015, due to delays in getting the allowance from the project but he hastened to add that even during that time he was treating community members animals at a fee. The CAHWs and members of the WLG concurred that the CAHWs involve the women and their husbands, when they go to treat or spray the animals such that they can also learn how to diagnose the diseases, quantities

Agro dealers advising farmers on how to use the inputs enhancing sustainable access to information and improving farmer's ability to farm better.

(mls) of specific drugs to administer, and how to administer. Thus, in the event that the CAHW is not around the women and/or their husbands can treat or spray the animals.

RWANU activities under crop and livestock inputs and services development did not directly contribute to access to affordable credit. Rather its credit which impacted on access to crop and livestock inputs and services as alluded to in chapter 3 sub-section 3.2.1.

5.2.2. WOMEN'S PARTICIPATION IN DECISION-MAKING, INCOME GENERATION AND INCOME ALLOCATION

Shift towards increased participation of women in decision making related to production of crops and livestock. This trend had started at the time of the baseline and has gained momentum during the life span of RWANU. Qualitative findings from the baseline survey indicated that at that time in general most agricultural decisions were made either solely by males or jointly by males and females. In cases where women and men make decisions jointly, women's input tended to focus on the storage and preparation of the crops for future use, while men tended to decide which crops the household would cultivate. Findings from this study reveal that women have greater influence on which crops and varieties to plant, and how daily products from livestock (notably goats) are used.

Increased crop production has triggered increases in marketable surplus and income from crops that was not previously available to women. Findings from the FGDs and in-depth interviews reveal that women have control of income from sell of their vegetables. WANU's livestock activity gender impact assessment²³ reveals that women confirmed having much more sole control over the income that they make, which was corroborated by their family members. Money earned by the women was spent on basic household needs. This positively impacts on both the absorptive and adaptive capacities of the households.

Those days women could not make any decisions, everything was in the hands of men. Nowadays women can make decisions related to crop production and ask the men to join them in undertaking the activity. This was because of the training received from RWANU (FGD participants Lookana FG, Namalu, Nakapiripiriti district).

The keyhole garden has increased variety of the vegetables we have. I at times sale some to buy cooking oil, salt, match boxes. Last year I sold vegetables of UGX 25000/ and used the money to buy clothes for my children. Because of these vegetables, I can now also come to the market as other women to sell something, and earn income which was not possible before (Lead Mother from Kangole, Napak district).

I grow vegetables: cowpeas, amarathus, Akeyo, onions and tomatoes in the key hole garden and also in other main gardens. I sell some and get money to buy other items which was not possible before (Akol Ann member of WLG and lead mother Naitokoswan Lotome, Napak distirct)

We grow vegetables especially cabbage, onions, and tomatoes in keyhole gardens and we sell some of the vegetables and earn income (Lonkugirit WLG, Lorengechora, Napak)

Women's ownership of goats has increased their sphere of authority and influence with regards to livestock ownership and management. RWANU's annual report FY16 reveals that this intervention has for the first time seen Karamojong women empowered through the ownership of goats over which they have authority. Findings from focus group discussions with members of the WLG and key informant interviews with CAHWs

²³ Kerine Lepillezi, 2016: Livestock Activity Gender Impact Assessment; RWANU December 2016

attest to the findings from the project annual reports. They report that women now own goats, are involved in their marketing, and decisions with regards to use of proceeds from sale of goats which was not possible before RWANU. The women also drive direct benefits from this involvement through increasing their herd size when goats produce or selling and using the resultant income.

Before RWANU women did not have access and power over livestock. But now they have power over their goats. They can no longer ask their husbands for permission if they wanted to sell their livestock (FGD participants from Olimasi Akuliako Anaberu WLG Lotome Napak).

Women's participation in decision making has greatly improved. Before we had nothing to say about animals (FGD participants Kitorosi WLG, Nadugent Moroto).

Ownership of the goats has given women responsibility and also to be interested in the management of the animals. They now check whether all goats have returned from grazing, monitor their health status. Now even if you travel far from home you know you have left behind a person that will pay attention to safety of the goats (CAHW and husband to a WLG member, Lorengechora, Napak)

Some women who have received goats are now able to manage them better. Community Animal Health Workers also support the women to manage their animals better which I think is a positive thing (Views from a District Commercial Officer)

Before RWANU women were not allowed to own a 4-legged animal but now they have goats. Both women and their husbands were sensitized about ownership of the animals which has empowered women with regards to decisions whether to sale and also how to use the money from sale of the goat. When they decide to sale, women move together with their husband to the market. The man helps her in negotiating the price, and the woman receives the money (CAHW and husband to a beneficiary in the WLG, Lorengechora, Napak district)

I sold one goat at UGX 70,000 and used the proceeds partly to buy seeds for planting, maize to make local brew for selling and also food for the family (*Member of Kitorosi WLG, Nadunget Moroto district*).

These findings are in line with findings from the RWANU's livestock gender activity impact assessment which found that RWANU was successful in changing norms around goat ownership and increasing women's ability to own goats, regardless of their gender or social status. Program activities increased women's sole and joint decision-making in households. However, men still held primary responsibility for goat management and care, as well as their sale and purchase.

5.2.3. SOCIAL AND ECONOMIC NETWORKS

Collective action facilitating adoption of practices and cheaper access to production inputs and services. By supporting the establishment of the Women Livestock Groups, the program facilitated group management of the goats but individual attribution in terms of ownership. The WLG members were trained together, established common shelters for housing the goats, the goats are grazed together, the women save and collaborate in raising funds to buy drugs for the drug kit, and access CAHW services together which lowers the transaction costs for ensuring animal's health care for the goats. Likewise the Manyata Herd Health Initiative, which focused on spraying and deworming of livestock, enhanced access to livestock health services at a lower cost. The livestock owners within a manyatta, composed of several semi-permanent homesteads that are usually part of a cluster that forms a neighborhood or village were trained together on good livestock health management practices, linked to a veterinary drug dealer, and sensitized to contribute money for accaricides. A total of 18 Manyata herd health initiatives were conducted where all animals owned by all

people in the Manyata were treated. This reduced cost of accessing quality accaricides and advisory services for the individual livestock owners. It also provided an entry point for the private veterinary drug dealers to access many livestock owners, create rapport and trust with them, while the livestock owners acquired knowledge and learn the livestock health management practices.

Before RWANU we were not buying livestock inputs as we did not own any livestock. Now we send the CAHW who is a husband of one of our members to go and buy the drugs for our goats because he is the one who knows which drug to buy. We contribute money to buy the drugs which makes it cheaper for the individuals to get their goats treated as you do not have to pay for the full amount of buying the bottle (FGD participants Kitorosi WLG Nadunget Moroto district)

Members of the WLG collect money and give me to buy drugs for them (CAHW, Kokipurat Parish Lorengechora, Napak)

The members of the FTGs were also trained together at the demonstration sites. Farmer participation in the farmer field days and exposure visits facilitated experience sharing and cross learning. The FTGs also provided the foundation for establishment of the ASCAs discussed in chapter 3 and the collective grain marketing groups discussed in chapter 6.

5.2.4. DIVERSIFIED INCOME SOURCES AND PRODUCTION SYSTEMS

Increased number of crops produced helps to address risk: The 12 households interviewed in the in-depth interviews reported planting an average 3.8 crops at the time of the interview, compared to 2.5 before RWANU. RWANU baseline survey reported an average of 2.6 crops for South Karamoja.²⁴ Participants in focus groups reported growing up to five different crops, an increase over baseline. These include eggplants, onion, cabbage, kale, cow peas, tomatoes, sukuma wiki, amarathus, beans, and maize. Previously farmers mainly relied on volunteer plants and gathering from the wild to access vegetables. Project annual reports reveal that household caregivers established over 10,000 keyhole gardens at their manyattas for household use and as an income source (RWANU 2016). This has improved their ability to cope with stressors as reported.

Farmers have increased the number of crops they produce by 50% or more, helping them address risk through diversification and become more resilient

Staggered planting and irrigation/watering help to lengthen availability and marketing widows. RWANU fostered irrigation and staggered planting by the horticulture production groups and model farmers, and watering by members of the mother care groups who plant in the key hole gardens. This increased food and income from these crops even during the dry season. Kitongoethe farmers in Iriiri were supported with drip irrigation system and a treadle pump by RWANU for their horticulture block farm. This technology has enabled members of this group to produce and sell vegetables like carrots, onions and cabbage even during dry season thus earning them extra cash.

²⁴ Baseline survey of Title II Development Food Assistance Programs in Uganda, March 2014. ICF International



RWANU sign post at Kitongoethe block farm in Iriiri



Members of Kitongoethe farmers' group preparing ground for planting

We relied on the kitchen garden projects to get vegetables especially cabbage, onions, and tomatoes, greens. We sell some of the vegetables (Lonkugiriti WLG, Lorengechora, Napak)

Members grow maize, beans, sorghum, eggplants, tomatoes, and onions. (FGD participants ToTo ASCA, Namalu Nakapiririti district)

Growing maize, cow peas, cabbage, onions, Sukuma wiki. Income has increased because we were able to plant and sell even in the dry season (Kitongoethe FG, Nabwal Parish Iriiri, Napak)

I grow cowpeas, amaranthus, Akeyo, onions and tomatoes in the keyhole garden as well other main gardens. I do not plant them at the same time such that I can stagger the harvesting. This has enhanced availability of vegetables which I eat at least 4 days in the week unlike before when we would have to rely on volunteer plants and use leaves of some trees to serve as vegetables. Before RWANU gathering wild vegetables was only possible during the wet season, but the keyhole garden has increased the number of months in a year when we have vegetables in plenty (Ann Akol Naitokoswan Thende WLG, Lotome Napak).

I used to grow only maize and beans, but now grow onions, cow peas, sukuma wiki, tomatoes, carrots, eggplants in addition to the maize and beans. I physically water the vegetables during the dry season. Engaging in horticulture production has increased my sources of incomes (Nangira Racheal, Moruita, Nakapiririti)

Adoption of sustainable crop production practices helped increase marketable surplus. The proceeds from crop harvests have been invested into other income generating activities which positively impacts households' adaptive capacities. Continued realization of increased production that has spurred marketable surplus will hinge on continued use of more resilient varieties coupled with agronomic practices which mitigate the effects of climate change (erratic rains and prolonged dry spells). Views from an in-depth interview with a woman farmer in Namalu and Komeret, Moruita sub-county attest to this.

Teddy Akol, 35 year old from Lokana Farmers Group Namalu sub-county, Nakapiririti districts notes that:

Before RWANU making local brew was my only source of cash income as there was no surplus produce to sell. I used to get 1 bag of rotten or damaged maize after sorting and then I would use this for brewing. I would then have to plough back part of the proceeds into buying maize from the market to continue brewing. Due to the increased yields last year, this time round I did not have to buy maize from outside as I got three bags of my own maize to use for brewing. This enabled me to earn money to meet my cash obligations as they would fall due. I was also able to set aside 2,400Kg of maize for home consumption and this is enough to take our family of 12 people to the next harvest and I sold 3,600kg of maize at UGX 1500 per kg earning UGX 5,400,000.

Maleha James (Lutiama Farmers Group, Komeret Village, Moruita parish, Moruita Sub-county Nakapiririti district. In 2016 I planted maize and harvested 1.8 tonnes which I sold to traders from Amudat. I used the proceeds to buy a grinding mill which has expanded my income generation stream.

5.2.5. USE OF AGRICULTURAL PRACTICES AND TECHNOLOGY THAT ARE ADAPTED TO STRESSORS, AND ADAPTABLE

Farmers have adopted resilient crop varieties and improved management practices.

Project annual reports reveal that farmers are adopting techniques and technologies that improve resilience. For example, farmers are now able to select the appropriate crops, suitable to their environment and determine the season when each variety is suitable. Farmers have adopted drought tolerant crops that are

appropriate for the region and have learnt the value of early planting to maximize use of early rains if they must have a good yield.

Project annual reports reveal that the number of farmers and others who have applied improved technologies or management practices with USG assistance increased from 11,027 in 2015 to 17,357 in 2016. Likewise, the number of hectares of land under improved technologies or management practices with USG assistance increased from 10,853 in FY 15 to 70,106 in FY 16. Access to tillage service providers coupled with increased appreciation of crop production as a viable livelihood strategy and more farmers getting interested in commercial farming were noted as key drivers for the increase in area of land.

Likewise access to livestock production inputs and services coupled with acquisition of knowledge has triggered adoption of better livestock health care and management practices which protect the herd and improve resilience of the animals. Findings from key informant interviews with District Veterinary Officers and focus group discussions attest to those from the project annual reports where it was reported that RWANU's efforts in the livestock management has highly contributed to the use of veterinary services in South Karamoja, and consequently more healthy animals.

Teddy Akol, 35-year-old from Lokana Farmers Group Namalu sub-county, Nakapiripiriti district notes that:

Before RWANU I used to plant maize variety Longe 10 on 4 acres of land from which I would get 1920kg at an average of 480kg per acre when weather conditions were good. After RWANU came to our group in 2015 I saw maize hybrid H520 performing well in a demonstration garden so I abandoned Longe 10 and started growing H520. I also adopted timely planting, planting in rows and timely weeding practices that I was not doing before RWANU. As a result, last year I was able to get 6,600kg from 6 acres of my maize, at an average of 1100Kg per acre despite the bad weather with intermittent rain and prolonged dry spell.

Before RWANU I was growing local maize, in a haphazard way. Now I planted longe 5 and weeding was done on time, and it was easy as I planted in rows using ropes. This enables me to estimate how many rows in the garden and therefore how much money do I need for hiring labour for weeding (Chepsangayi Zipola from Mwoto FG, Agule village, Lokaris Parish, Karita Sub-county Amudat district)

We used not to treat our animals but now have learnt a lesson and started treating the animals. Proper management of animals to ensure that the little grass is well utilized (FGD with women members of Chomyogh FG, Compas, Karita, Amudat district).

During the wet season when vegetables are plenty I dry some such that I use them during the dry season when there is none in the garden (Lead Mother from Kangole, Napak district).

Farmers who have adopted the technologies have found it easier to increase their crop yields. But again, this is still influenced by droughts, and floods which frustrate them (Views from a District Commercial Officer)

5.2.6. HOUSEHOLD ASSET BASE AND ACCESS TO FOOD

Farmers invest proceeds from increased crop production productive assets. Farmers who have realized increased production and marketable surpluses following adoption of improved crop production practices have invested proceeds into productive assets like goats, cows, land, and oxen.

Likewise, provision of goats to WLG members. coupled with improved livestock health management has increased the average herd as goats have multiplied. This is mainly true for those groups that received the goats in 2014 and 2015 compared to those that received in 2016, whose animals were just starting to deliver

while others died or had had abortions due to scarcity of pastures and diseases in 2016. Use of preventive and curative livestock drugs has reduced loss of animals and improved access to milk.

Anecdotal views on impact on household assets and food access

Those who planted cassava coped even better because it withstands drought (FGD participants Lokungurit, Kokupurat, Lorengechora, Napak district)

Some of the farmers who plant crops according to RWANU's advice have surplus food which they sometimes stock or sell part of it for income to solve other needs (Views from a District Commercial Officer)

I used the proceeds from sale of maize to buy two goats and two cows as well as three acres of land so as to expand our production (Teddy Akol, Lokana Farmers Group Namalu sub-county, Nakapiripiriti)

RWANU ensured better survival for our animals which has enabled us get more income upon selling. This income helps us in buying a variety of food stuffs. We will continue using the skills acquired well after RWANU (FGD participants Thende WLG, Naitakosuan, Lotome sub-county Napak district).

Acquisition of knowledge on better management of goats and its adoption has improved their health and survival. Before the goats were dying due diseases as we were not treating or spraying them but now treat, spray and also give them dewormers. This has increased survival of the goats (Celina Chepchock, Compas, Karita Amudat).

Livestock health has greatly improved. Hence increased productivity, more milk for home use and sale, and livestock populations are going up again. This is reflected in the numbers vaccinated and livestock sales which have been increasing since intensification of livestock health management (Views from District Veterinary Officer)

5.2.7. GAPS AND REQUIRED ACTIONS TO STRENGTHEN RESILIENCE

Lack of knowledge on proper seed selection and recommended number of recycling for the open pollinated varieties. Findings from in-depth interviews with farmers revealed that some farmers who purchase and use open pollinated varieties from the agro-dealers were buying every season. This seed can be recycled for up to three seasons without losing its vigor. Future programs should sensitize farmers on proper seed selection and recommended recycling in case of open pollinated varieties.

Limited range of crops and animals promoted in the project: Funding levels limited the crops promoted by the project to mainly cereals (maize and sorghum), vegetables, and cassava. Likewise, direct efforts in livestock were limited to goats, with other livestock types only influenced through capacity building on preventive health, and access to inputs and services. The project could have widened this and diversified the risk further if it also promoted bull rush millet, pigeon peas, okra and poultry. Future programs should increase the range of crops promoted to include crops known to perform well in drier areas such as bulrush millet, pigeon peas, okra, and fruit trees notably guavas and mangoes. Projects can learn from the experiences of WHH and ACF in promoting the new pigeon pea varieties (SEPi1 and SEPi2) released by the National Semi-Arid Agricultural Research Institute (NASARI).

Land under production is still small and there is no use of soil fertility practices. Although farmers have increased land under crops, this is from a very low base and the sizes are still relatively small. There is also virtually no use of soil fertility improvement practices which would further increase productivity. This presents a risk of soil mining which will in future lead to lower yields. Future programs should continue to encourage farmer expansion of land under production and adoption of soil fertility improvement practices.

The commercial seed sector does not produce seeds for all crops. Planting materials for vegetatively propagated crops like cassava are not produced and supplied by the commercial seed sector. The Uganda seed policy recognizes the informal and intermediate seed systems, which provides an opportunity for NGOs through programs like RWANU to support farmers to multiply quality seed and planting materials. Although the program supported farmers to produce cassava varieties in block farms, the groups were not liked to MAAIF to certify their gardens as certified producers of clean planting materials. Hence the groups sold the stems to other farmers but government programs like OWC and other agencies sourced from certified producers of clean planting materials outside the region. Future programs should:

- i. Support farmer to multiply quality planting materials.
- ii. Support emergency of seed banks for the seeds not produced by the commercial sector
- iii. Link farmers to agencies in MAAIF responsible for certification of seed multiplication gardens
- iv. Engage in advocacy to encourage government programs and other actors working in the region to locally source the seed and planting materials from the certified groups

Limited awareness of existence of agro-dealer shops in the sub-counties by some farmers. Some farmers are not aware about the existence of agro-dealers who sell crop inputs in their sub-counties. The radio programs and use of public address systems to relay the messages during market days only started in last quarter of the project final year. Required actions to address this include:

- i. Continue to support awareness creation on sources of quality/genuine inputs and advertising for the agro-dealers through drive-in during market days, and on the local FM stations.
- ii. Future programs should address building farmer capacity in identification of genuine inputs, (e-scratch, and also looking out for the blue labels on the seed packs, seeking for receipts, not destroying the packing material before seed has germinated, performing germination tests).

5.3.IMPACT OF CROP AND LIVESTOCK INPUTS AND SERVICE DEVELOPMENT ON MARKET RESILIENCE

5.3.1. DIVERSITY OF RELATED PRODUCTS AND DIVERSE MARKET CHANNELS

RWANU support has enabled the agro dealers to increase their offerings. The commercial input supply network in southern Karamoja only emerged with support of RWANU. Prior to RWANU there were no private input suppliers operating in south Karamoja. Farmers previously relied on donations from NGOs and government or buying from local shopkeepers with a limited selection of low-quality seeds. Government and NGOs continue to provide inputs though they are problematic due to late delivery dates, and not all farmers receive. The agro-dealers provide a range of inputs which provides farmers with options to choose from.

These include

- i. Seeds for maize (Longe 10, Longe 5, MM3, Hybrid), sorghum (Seso3), beans (K132, Nabe 15,
- ii. Nabe 17, Nabe 16), groundnuts (red beauty & serenut 2), cowpeas, vegetable seeds including tomatoes, water melon, cabbages, carrots, onions, kale, sukuma wiki, egg plants and green pepper.
- iii. Crop protection chemicals including at least two types of herbicides and up to 7 different types of pesticides and fungicides
- iv. Tools including: ox-plows, replacement parts for plows, hoes, pangas, water cans, knapsack and hand sprayers, treadle pumps, storage silos, tarpaulins,
- v. Veterinary drugs and services: vaccines notably for New Castle Disease in poultry, acaricides, multi-vitamins, and a variety of curative drugs.

Agro-dealers stock a range of inputs which gives farmers options to choose from.

Livestock farmers can access services directly from the private practitioners as well as from the Community Animal Health workers. CAHWs provide a link between the farmers and the owners of the vet drug shops. Agro-dealers in Karita and Iriiri have established links with village agents who support them in establishing farmer inputs needs to inform stocking decisions but also facilitate selling of inputs to farmers deep in the villages.

The crop and livestock inputs and service development activities have not directly influenced the output markets where farmers sell. Contribution of this intervention to output markets can only be traced through increasing production and marketable surplus that have allowed some farmers to bulk some grains while also selling unilaterally to middle men. Details on bulking are presented in chapter 6.

5.3.2. REDUNDANCY OF MULTIPLE BUYERS, SELLERS AND SERVICE PROVIDERS

Other NGOs have engaged RWANU supported agro-dealers diversifying their buyers. This has provided an opportunity for the dealers to further strengthen their capacity and experience in supplying inputs to farmers. RWANU has reached out the other actors in the region to use the agro-dealers as opposed to establishing parallel structures that would weaken the system. This strengthens the position of the agro-dealers and increases odds for their sustainability.

Private vet practitioners have established drug shops in the project districts. Vets have set up several shops: Namalu Farm supply in Namalu sub-county, God's Grace Vet-Centre in Moruita sub-county, Lorengedwant Livestock and Produce cooperative in Lorengedwant sub-county in Nakapiripiriti district, Aloevet Pharmaceuticals and Consultancies Ltd, in Kangole trading center in Napak district, and one in Nduget in Moroto among others. All of these have been set up during the life span of the program. The shops serve as bases from which the private vet practitioners sale drugs and also move to provide services to farmers. They reported visiting the kraals to sensitize the livestock owners and create awareness on new drugs. All the interviewed vet dealers and CAHWs reported that they will continue to operate even after RWANU.

I sale drugs to CAHWs who provide services to farmers but also sale directly to farmers who come to the shop; I treat people's animals when the CAHW refers the case to me or when the farmers call for the service directly; I provide advisory services to livestock owners and in case of new drugs, at times I treat a sample of animals free of charge, for the farmers to see the results. That's when they would come and start demanding for the drug. The CAHWs are now very helpful in creating awareness about new drugs and enhancing farmer appreciation in use of the drugs and veterinary services (Vet drug shop dealer Moruita Nakapiripiriti).

I serve as the link between the agro-vet shop and community members. In case the agro-vet wants to meet the farmers I support in mobilizing them. I treat their animals, and introduce new drugs to them beyond what they used to know (CAHW Moruita Nakapiripiriti).

I educate farmers on how to treat and spray their animals. I treat their animals for a fee when I use my drugs and work with the Nakapiripiriti district veterinary doctors to do vaccination. I have also been trained by other organizations such as LWF, CAREF and USA doctors and provide service to their beneficiaries (CAHW Kamaturu Parish Lorengedwat, Nakapiripiriti).

CAHWs are a resource which will remain in the community and they have been very useful in enhancing delivery of livestock health services. The CAHWs have been like to certified drug dealers to whom they are recommended to buy drugs. Now there are three registered drugs shops in the district compared to 1 before RWANU (Views from a DVO).

I will continue to provide services, since there is access to the drugs at the drug shop, I have the knowledge and can consult the vet officer at the sub-county for advice (CAHW, Loregendwat Nakapiripiriti).

The agro-vet dealers under KABA have enable farmers to access inputs and get value for their money. They have helped to provide a reliable source of inputs and also help deal with the issues of fake inputs which were coming up in the region (Views of a DVO).

CAHWs foster prompt response to disease outbreaks. The CAHWs have helped in creating awareness about new drugs and enhancing appreciation in use of veterinary services among farmers. They facilitate early reporting of disease outbreaks to private and public vet providers ensuring prompt response. This positively impacts on the absorptive and adaptive capacities of the system.

5.3.3. TRUSTING RELATIONSHIPS THAT ALLOW COOPERATION, COMMUNICATION, LEARNING AND INNOVATION

The agro-dealers have established relationships with national suppliers. The local agro-dealers have business relationships with seed companies (Victoria Seeds, FICA, Equator Seeds, Pearl Seeds, East African Seed Company) and those engaged in importing, repackaging and distribution companies/supplier for crop agro-chemicals (MTK, Victoria Seeds).

Vet practitioners reported linkages with suppliers and distributors of veterinary drugs in the country (Kampala-based Vet Center Ltd., Quality Chemicals, Farm Support Ltd. and Norbrook, and Mbale-based Last Chance). They have phone contacts for the marketing officers of the various suppliers. They do not always have to travel to Kampala to buy the inputs because they can order by mobile phone, then send money to the company through mobile money or deposit on the companies account, take a photo of the deposit slip which they either send on WhatsApp or email and the company then puts the consignment on a bus for the dealer to pick from an agreed location in the region. Some have been able to get inputs on credit from the suppliers. The ability to source inputs directly from the suppliers enables the agro- dealers to sell the inputs at lower prices compared to traders/hawkers who bring the same items in periodic markets.

Local agro-dealers have established relations with suppliers that facilitate faster stocking of inputs.

National seed companies and local agro-dealers collaborating to stimulate demand for improved seeds

Suppliers have built confidence and trust in me, and I even just call them on phone to send the inputs once I give an order and send mobile money. Through linkages to the seed companies, I can get seeds on credit from one of them, where RWANU connected us. I got seeds worth UGX 11 million when I had made a down payment of only 3 million. Farmers have built confidence in the shop. Sometimes I advance them inputs on credit and they can pay after like three days. Sometimes they may come when the item they want is out of stock and I ask them to give me a few days to have the item available (Agro-input dealer in Moruita Sub-county, Nakapiripiriti district).

The relationship between me and my supplier is good. He can give some items on credit, I sell and then pay back. My supplier informs me about new products on the market and also gives me samples to test their efficacy. Together with the 10 CAHWs in the sub-county we have formed a saving and credit association each saving UGX 5000 (USD 1.4) per week from which any member can borrow and buy drugs from the shop. This bonding between me and the CAHWs has increased trust among us. The community has also begun to trust the CAHWs so they send them to buy drugs and treat their animals (Vet drug shop dealer Moruita, Nakapiripiriti)

Originally, we had no business in Karamoja but this has changed. Business volumes is increasing and input dealers from the region are taking seeds some making orders and paying cash of even up to UGX 15 million. Now have contacts of all dealers, have visited all their premises so as to create rapport and will continue to visit them every quarter. We work together to stimulate demand by creating awareness through demonstrations and farmer field days at the sites. We have trained the agro-dealers on our products and the production techniques. (Views from national level seed company).

Farmers have increased their trust in me, so they call me since they know that I am competent to treat their animals. People now buy drugs and kept in their manyata's such that when animals fall sick they treat themselves since they have the drugs or if the animal does not get well, then they call me for assistance (CAHW Lokwakwa, Lorengedwat Nakapiripiriti).

We have established trust with the agro-vet dealer so he can give you drugs on credit. I have known him even when he was operating in Iriiri, so the long term relationship helped us to establish trust. When you call the agro-vet he will come to treat or he will give you advice. I at times treat farmers' animals on credit but challenge is farmers not paying back (CAHW, Kokipurat, Lorengechora, Napak)

Farmers' reluctance to pay for services of the CAHWs is a challenge for their operations (Views from DVO)

Seed companies collaborating with local agro-dealers to stimulate demand: Seed companies that have always seen Karamoja as a risk for investment and business are now working closely with local agro-dealers. By working together with agro-dealers and participating in the Karamoja Trade fairs the seed companies have created awareness about their products and ensure that quality inputs are available at the right time. Through the partnerships with agro-dealers FICA Ltd. and Victoria Seeds have continued to support establishment of demonstration gardens and organizing of farmer field days at the demonstration sites geared at creating awareness about their varieties and stimulating demand. The seed companies provide seed and fertilizer to use on the sites while the dealer provides the land, and labor for the field operations. They work together to organize field days on the demonstration sites. The seed company pays for the public address system used to drive around the villages and inform people about the field day at the demo sites. Companies also provide the agro-dealers with publicity materials such as leaflets and brochures about the products sold by the companies for on-ward distribution to farmers who attend the field days as well as those who come to buy from their shops. The agro-dealers provide advisory services on how to use the inputs to farmers who purchase inputs from them.

Uganda National Agro-Dealers Association (UNADA) linkages widened local agro dealers' networks. RWANU facilitated the agro-dealers to be linked to the Uganda National Agro-Input Dealers Association (UNADA) which they joined and become members. This has widened their networks and provides an opportunity to learn from experiences of other agro-dealers from outside Karamoja. Two of the four interviewed agro-dealers acknowledged having attended UNADA trainings organized outside the region in Lira and interacting with other dealers.

Creation of Karamoja Agribusiness Association (KABA) and branding of the shops enhanced business. This was noted to have enhanced visibility of the agro-dealers, cultivates trust among farmers who view the shops as outlets for genuine inputs, and fosters networking and information sharing on pricing, product seasonality, and when to stock the various inputs. The networks improve the agro-dealers' capacity to learn and address market issues.

Partnerships between CAHWs, private practitioners and public vet drive cooperation and learning. RWANU supported the agro-dealers in collaboration with communities to identify CAHWs within their catchment areas

and subsequently train the CAHWs and to establish business relations with them as agents for veterinary outreach services. CAHWs are linked to certified vet drug dealers from whom they buy quality drugs to stock their kits, access information on new drugs, seek advice, and refer cases which are beyond their capacity. The CAHWs have also been linked to the public veterinary service providers (District Veterinary Departments) whom they call to seek advice and report diseases outbreaks. Some CAHWs have smart phones given to them with an application that has disease surveillance information. They are advised to call and seek advice from the public veterinary staff as well as private practitioners they engage with. The public veterinary service providers advise community members to use the services of CAHWs.

5.3.4. MARKET GOVERNANCE AND POLICY ENVIRONMENT CHARACTERIZED BY TRANSPARENCY, EQUITY AND CONSISTENCY

Agro-dealers acquired capacity to identify and stock quality inputs: RWANU trained agro-dealers on product knowledge, business management as well as safe use and handling of agro-chemicals. The training on product knowledge and exposure through the trade fairs equipped the agro-dealers with information and knowledge on how to identify and stock genuine and quality inputs. They appreciated the value of sourcing inputs from genuine suppliers, and acknowledged conducting germination tests, checking for manufacturing and expiry dates, e-scratch and checking the blue labels issued National Seed Certification Service (NSCS) under MAAIF by the on seeds packets so as to ascertain quality of the inputs. The mandatory blue label specifies the company name, variety, production date, season, batch and lot numbers and these serve as a mark of certification for the commercial seed. Training on safe use and handling of agro-chemicals positioned the agro-dealers to get legitimacy from MAAIF but also strengthened their capacity to handle these products safely and advise farmers on their proper use.

Improved knowledge on brands supplied by genuine companies: Participation of seed companies and suppliers in agro-dealer training events and the trade fairs enabled creation of awareness on the different brands from various companies. Price lists shared by the suppliers and information sharing through KABA enable the agro-dealers to make informed decisions when stocking inputs and setting selling prices to farmers. The seed companies inform the agro-dealers when their products are out of stock alerting them not to buy what is in the open market. Companies share information materials about their products and brands which agro-dealers pass on to farmers. This strengthens farmer ability to make informed choices on inputs they buy. Linking farmers and CAHW to the agro-dealers has enhanced their ability to get quality inputs.

The National Drug Authority engages with the private vet service providers for certification and inspection of premises. However, hawking of veterinary drugs notably by traders from Kenya exposes farmers to risk of accessing drugs from unqualified personnel. Although the district agricultural offices are expected to inspect premises of crop agro-dealers, this was only acknowledged in Napak. RWANU and other projects have to establish a strong advocacy with the government to regulate use of genuine conventional veterinary drugs through regular inspection to reduce the risk of fake drugs from entering the market.

When I placed an order for longe 10 and H520, the seed companies alerted me not to buy from the distributors as all seed that was in the market was fake at that time. They had not released it on the market yet distributors in Kampala had these varieties. UNADA has trained us on how to detect genuine and fake inputs. Emphasized the need to do germination tests, e-scratch and looking out for the blue label on seeds. UNADA also links us to the seed companies and they came with East African Seed Company to conduct the germination tests together with the dealer. The companies also share market information with us at the beginning of the season when we are placing the first orders. They give you a price list and if there is any adjustment they will also inform you. For the agro-chemical we just have to buy from the main suppliers who have rebranded the products (Agro-input dealer Namalu).

We do germination tests and also source directly from reputable companies. The company provides the price list when you first order, and if they change they call and inform you. They also inform you if the variety you are interested in is out

of stock. The companies provide brochures/leaflets about their inputs and we distribute these information materials to farmers (Agro-dealer Iriiri, Napak).

Although Karamoja has not been so infiltrated with fake inputs due to relatively low demand. The agro-dealers have been exposed to the brands for various companies during the trainings and also during the trade fairs in the region hence they know. They have also been encouraged to buy inputs directly from the genuine suppliers (*Views from national seed company*).

The supplier takes keen interest in quality of the drugs he supplies to me because of our relationship. One time I bought drugs but on reaching at my shop I realized the color of the drug was different from the usual one so I called him. He apologized, and asked to return it as he had already put it aside in a box that was met to be returned to the company since it was not good quality. I returned it and he replaced it with the good drug (Vet shop owner Mourita, Nakapiripiriti).

5.3.5. GAPS AND ACTIONS NEEDED TO STRENGTHEN RESILIENCE

Continued provision of free inputs to farmers poses a threat to agro-dealers and impairs resilience of the system. Though not accessible to all farmers, it perpetuates the dependence syndrome and farmers' expectation of handouts from development agencies. Future programs should engage in advocacy for the government programs and other actors to reduce free input distribution and or use the established agro-dealers in channeling their inputs to farmers.

Limited crop sector agro-dealer knowledge on the regulatory framework for the business they engage in. Findings from interviews with agro-dealers point to limited awareness on the existing regulatory framework and responsible institutions. Future programs should sensitize the agro-dealers in the crop sector on the regulatory framework for crop inputs in the country.

Limited income streams engaged in by the agro-dealers. Agro-input business is seasonal hence the dealers find difficulty maintaining the rent during off-season. The agro-dealers need to widen their income streams they engage in. Options include produce buying and other service provision for instance mobile money services. Future programs should sensitize agro-dealers on diversifying income streams.

The curriculum for training CAHWs was developed by MAAIF and Makerere University in collaboration with District local governments and other development partners. However, it's delivered without a central authority which would enhance certification of the CAHWs. Hence there is need for standardization of the certification criteria. Future programs operating in Karamoja should engage in advocacy for certification of CAHWs.

Limited training provided to CAHWs: Some CAHWs were trained for just one day and would need more exposure through refresher trainings. New drugs come on the market and also new disease surface. Future programs should support refresher trainings for CAHWs on diagnosis and management of diseases notably new ones, as well the new drugs and how to use them.

5.3.6. SUSTAINABILITY

RWANU has strengthened technical competence of agro-dealers, CAHWs and farmers. The agro-dealer and village agent/CAHW models with built-in incentives for the service provision increase the odds for continued use of the acquired skills and provision of services to farmers. The agro dealers and CAHWs are a resource that facilitates continued access to crop and livestock inputs, services and extension advice to farmers. Farmers have appreciated use of improved seed, with members of block farms buying collectively, lowering the transaction costs. Emergence of village agents who are nearer to farmers' localities enables them to get

the quality inputs at lower prices, without having to spend transport. This provides a foundation for continued access to quality inputs.

Supporting agro-dealers to acquire certificates in safe handling and use of agro-chemicals, which is a mandatory requirement for certification and licensing by MAAIF provide a strong foundation for their recognition by authorities and hence continued existence in the areas. The linkages between agro-dealers and suppliers as well village level agents like CAHW provide a foundation for the agro-dealers and CAHWs to renew and replenish their knowledge on products in the market as well as market information. It is likely that commercial service provision will continue in the project areas even after end of RWANU. However, free distribution of inputs by government and international NGOs is a threat that impairs sustainability of the input business.

6. BULK GRAIN MARKETING AND BLOCK FARMING

Summary findings: RWANU promoted the establishment of collective grain marketing groups and bulking centers and linked them to buyers. Bulking positioned farmers to receive higher prices hence increasing their earnings from produce. The bulking centers sell directly to big buyers as opposed to local middlemen. Farmers can hold on to produce for several months and sell when prices increase. The bulking centers have enabled farmers to venture into produce trade by buying from other farmers after harvest or buying from other places to resell to community members for food. This has widened incomes streams for the members but also ensured availability of food in the region.

Block farms have helped increase beneficiaries' knowledge on sources of inputs, and good agronomic practices. They have stimulated change of mind set towards commercial oriented production and increasing acreage under crops. The block farms have facilitated introduction of new varieties for cassava, positively impacting on adaptive capacities of the households. Block farms position farmers to share resources and increase efficiency of the production process through reduced transaction costs for purchasing inputs, and shared labor. Sharing of produce from the block farms enhance availability of food in the member households. The clear record keeping procedures ensure accountability and transparency, strengthen trust in the system and hence offer a good foundation for continued use of the bulking centers.

Grain bulking and block farms have encouraged farmer adoption of production practices. These interventions enhanced social capital through increasing networks, and sharing of information. Grain bulking and block farms also strengthen farmer capacity to withstand and respond to effects of drought through use of suitable technology, enhancing food reserves, cassava production and higher earnings that support consumption smoothening. However low coverage due to limited number of groups and members involved in grain bulking and block farms coupled with side selling limit the impacts from these interventions. Increasing quantities bulked would enhance access to big buyers, better prices and hence more earnings for the members.

Establishment of bulking centers has strengthened the marketing system. Farmers collectively sell up to five commodities to traders from within and outside the project districts and community members during times of scarcity. A host of buyers offer alternatives to choose from and enable groups to earn premium prices compared to selling to middlemen. RWANU has catalyzed use of standard measurements in selling of grain by members of the bulking groups who previously sold individually using local containers that are suspect to manipulation. Bulking groups share market information which enables members to make informed decisions about selling prices.

6.1. DESCRIPTION OF GRAIN BULKING AND BLOCK FARM INTERVENTIONS

The intervention on grain bulking focused on facilitating increased linkages to output markets. Prior to the start of the bulking intervention the program conducted an assessment in all the target sub-counties with a

view to assess volumes, determine farmer interest in bulking, and level expectations. This assessment revealed that although farmers would produce food, they would be food insecure within three months largely due to uncoordinated sale of crop produce in the households often orchestrated by men who wanted to get money for drinking. Bulking was adopted with the objective of improving produce marketing without compromising household food security. The bulking centers would allow produce to be stored away from home with a portion earmarked for the market and part of it for home consumption. Program interventions included supporting farmers to build their capacity in market-oriented production and group marketing; supporting establishment of bulking centers, linking the centers to buyers, as well as training farmers and agro-dealers on formation and development of cooperative associations.

RWANU facilitated farmers to organize into marketing groups to ease collective marketing and its associated benefits including better vertical and horizontal linkages in the value chain. This was achieved by training farmer group leaders who were then expected to pass the knowledge to their FTGs so as to form market groups. The groups were then linked to grain buyers. A total of 119 FTGs were linked to grain buyers (21 in FY14 and 98 in FY15).

Based on findings on potential volumes and interest expressed by farmers in particular sub-counties, the program initiated bulking interventions in seven sub-counties: Lorengechora, Kakomongole, Lokopo, Iriiri, Loregae, Namalu, and Karita in 2015, later expanding to Lorachat and Nabilatuku in 2017. Bulking targeted all interested members of the program farmer training groups and block farms. No specific targets for gender and youth. Key outputs under this model include supporting the establishment of 10 bulking centers in the green belt areas and linking them to buyers of maize, sorghum, beans and green gram. These centers sold to smaller buyers from the neighboring Turkana and Busia-Kenya and local vendors who also sold to resellers within South Karamoja, and to individual customers and retail maize mills. A total of 1,652 farmers (929 males, 723 females) participated in collective storage and marketing in FY15 while 1,389 individuals (946 men, 443 women) were involved in FY16. A total of 516.3 tons of maize, 158.2 tons of sorghum, and 3.42 tons of legumes (beans and green grams) were sold by the participating farmers in the last 2 years. Groups were also trained on forming, operating and management of cooperatives. This has resulted in the formation of four associations.

In 2013 the Minister for Karamoja Affairs recommended that all livelihoods partners in the Karamoja region should engage farmers to open up more land and increase production in order to fight food shortages at the household level and for marketing. In line with this recommendation RWANU promoted block farming activities with a view of enabling farmers to increase food production for household consumption and the market. Block farms had a convert objective of improving farmer capacity towards commercial production. The process involved identifying and supporting interested FTGs groups to start block farming.²⁵ Selection of FTGs eligible for block farming was based on the group performance in the demo plots and individual household production in the previous season, availability of a large piece of land, and interest shown by the members. Starting with IY2, a total of 60 FTGs that had excelled in the demos and replicating demo practices in their individual gardens were identified to open block farms for grain crop production. RWANU provided block farms groups the necessary training and follow up technical backstopping. The program worked with a total of 177²⁶ block farm groups between 2014 and 2016 each opening 10 acres. To facilitate land opening, a total of 102 block farm groups (60 in 2015 and 42 active groups from FY 2014) each received a pair of oxen and a plough from RWANU. The groups were also linked to private tillage service providers with the groups initially paying 30% for the cost of services while RWANU covered the 70%. In 2014 the groups were given seed of their choice but had to contribute 30% of the cost for seed in 2015 and 2016. A total of 800 bags of

²⁵Block farming: A group of kin and neighbors (10-20 farmers) coming together and opening up new land of up to 10-12 acre and perform farming tasks as a group. Farmers should have the experience of working in and observing the results of demo gardens before participating in block farms.

²⁶ 57 in 2014, 60 in 2015 and 60 in 2016.

cassava planting materials were availed to ten block farming groups as an additional food source within the households.

6.2. IMPACT OF BULK GRAIN MARKETING AND BLOCK FARMING ON HOUSEHOLD RESILIENCE

6.2.1. ACCESS TO PROFITABLE OUTPUT MARKETS, AFFORDABLE INPUTS AND SERVICES, EXTENSION, AND AFFORDABLE CREDIT

Bulking enable farmers to received higher prices: Households that sold through bulking centers were able to benefit from moving higher in the value chain and sell to big buyers/traders as opposed to selling to middlemen at farm gate. Bulking also allowed farmers to hold on to their producer for longer selling it at higher prices compared to those who sold immediately after harvest. Households that bulked received UGX 150, 200 and 500 per kg more than those who sold unilaterally in 2015, 2016, and 2017 respectively. Members of bulking groups on average earned UGX 280 (USD 0.08) per kg of grain over and above prices received by those who sold unilaterally in the last 3 years. The bulking groups also hold the produce and sell it on retail basis to other community members at higher prices during times of scarcity. Bulking has improved farmer knowledge and appreciation of importance of proper post-harvest handling to ensure quality and selling at later dates at a profit.

Bulking positioned farmers to receive a higher unit price for their grain and earn more income

Before RWANU we were selling cheaply to brokers and traders as we did not mind about profits. The bulking center allows some members to store produce and sell later when prices improve. Income levels from crops have improved for those who bulked. After bulking we received traders from Iriiri, Mbale and Caritas(Kopukwa Bulking Group, Lorengechora, Napak district).

Now days we can wait for even up to month and sale when prices are good. We sold our sorghum at 1800 per Kg compared to UGX 600 for those who sold immediately after harvest (Kitongoethe FG Iriiri, Napak).

We stored our maize from the block farm and waited for prices to increase. We sold to buyers from Nakapiripiriti town, Tokola and Lorackat sub-counties in April 2017 at UGX 1,670/Kg earning more money compared to farmers who sold immediately after harvest or in December who received 1,000/Kg. The buyers picked the produce from our store hence we did not have to transport it to the market (Lookana FG, Namalu Nakapiripiriti).

Block farming built farmer knowledge on sources of genuine inputs. Farmers that participated in the block farms were at first supported to access quality seed from agro-dealers with RWANU paying 70% of the cost while farmers paid 30%. In subsequent years, farmers were buying seed and other inputs for the block farm using their own money. By continuing to buy improved seed all members get to learn where to find the quality seeds and gain confidence in the private input supply system.

Block farms facilitate farmer to farmer transfer of knowledge. Block farm groups increase farmer knowledge on good agronomic practices. The members learn from those who know the practice through practical application. Continued application within the block farm where members guide each other allows the individuals to perfect the agronomic practices through learning by doing and this increases their propensity for action in their own gardens.

Proceeds from block farm produce used to capitalize ASCAs. One of the block farm groups (*Namalera FG, in Komeret Mourita Nakapiripiriti*) put part of the proceeds from their produce into their ASCA for members to

borrow, thereby increasing member access to loans. No other cases of block farm and grain bulking interventions directly impacting on access to credit were recorded in this study. Rather, the ASCAs that impacted on block farms by allowing members to get funds for hiring land and buying inputs and grain bulking through supporting consumption smoothing and allowing farmers to hold on to the produce in the bulking centers. This notwithstanding, grain bulking has potential to impact on access to credit if the farmers save part of the higher earnings in the ASCAs.



Members of Namalera group, Moruita Sub County at their bulking store

6.2.2. WOMEN'S PARTICIPATION IN DECISION-MAKING, INCOME GENERATION AND INCOME ALLOCATION

The majority (65%) of the members in farmer training groups and block farms were women. Thus, participation in block farm and grain bulking groups has increased their involvement in decision making within the groups. The women control income they get from these activities.

Relative to men, women have fewer resources needed to upgrade such as labor, information, training, and membership in horizontal associations, such that women are not well-positioned to maintain and improve their performance in value chains²⁷. Thus, participation in the block farms and bulking groups has enabled women to access information, shared labor for activities, and facilitated holding on to produce as well as selling to bigger buyers who offer a higher price compared to local middlemen. This positioned them to receive a higher price for their grain compared to unilateral selling to middlemen or selling immediately after

²⁷ Rubin D, and Manfre C, 2012: Modernizing Extension and Advisory Services (MEAS) Technical Note on Applying Gender-Responsive Value Chain Analysis in Agricultural Extension and Advisory Services

harvest. The increased revenue due to higher prices improves households' abilities to deal with pressing needs for cash and buy other food stuffs.

Before RWANU women had little knowledge about record keeping and financial literacy and this prevented their effective participation in decisions at both group and household levels, as well as involvement in business activities. Women have become more assertive due to exposure and knowledge through RWANU trainings. Because women directly generate their own income they now have more say on what to allocate their money to. However, men still get involved (Kopukwa Bulking Group, Lorengechora, Napak district).

We used part of the proceeds from selling produce harvested from the block farm last year to reinvest it in block farm activities for this year (rent land, buy seed, pay for tillage services and weeding labor) Lookana block farm group, Namalu, Nakapiripiriti).

Many women participating in commercial activities in markets earn incomes which support food production and diversification (Views from the Commercial Officer).

6.2.3. SOCIAL AND ECONOMIC NETWORKS

Block farmers learn and work together as groups to save time, labor and transaction costs for accessing production inputs. The reduced transaction costs through collective action in buying seeds for block farms, use of technologies and agronomic practices, and collective action in undertaking activities increases efficiency of the production process. This upgrades their performance in the value chain.

Block farms facilitate farmers to engage in skilled agronomic practices, improve efficiency of production processes and positions them to maintain and improve their performance in value chains.

Participating in bulking groups increases farmer contacts and networks, and facilitates information sharing on prices. Hence farmers make informed decisions when selling their produce. The collective bulking has reduced exploitation from brokers who buy produce at low prices at the farm gate during harvest. The bulking centers have allowed their members, notably women, to venture in produce trade. Members buy produce from other farmers during the harvesting period, and keep it in the bulking center to sale latter or they buy from other areas to sell food in the area.

Block farms have contributed to heightened farmer awareness and realization/appreciation of the potential for commercial farming in Karamoja. Group farming, especially in block farms, has allowed farmers to see the benefits of working together and cultivating a large tract of land together. Findings from project annual reports reveal that through this activity, farmers now appreciate that commercial farming is a possibility in Karamoja. This has motivated more farmers to take up similar initiatives with strong adoption in the greener belts, especially with maize. This has resulted into increased production and productivity for the adopting farmers. Increase in volumes produced coupled with awareness creation on advantages of collective action has influenced change of mindsets for some farmers and encouraged them to venture into bulking.

The bulking started with RWANU. The group has 100 members, 33 men and 67 women. Group members buy produce from other community members who are willing to sell early and the store it at the bulking center. RWANU introduced the white boards where we are able to get information on prices (Kopukwa Bulking Group, Lorengechora, Napak district).

We are a group of 15 women. We harvested 60 bags of maize from our block farm, sold 45 bags and used part of the proceeds to buy 4 cows for the group, shared UGX 150,000/ (each member getting 10,000), paid rent for

10 acres for the block farm this year and kept the balance as a buffer for eventualities. The cows are kept in one home such that we can always be able to monitor as a group. Our plan is to buy more cows even this year if we get a good harvest. When the animals multiply we will give each member a cow. The remaining 15 bags we sold 10 bags to get money that we used to hire tractor to plough and also pay for weeding labor. Each of us also got 35kg of maize after sharing the remaining five bags (Lookana FG, Namalu Nakapiripiriti).

Program interventions catalyzed formation of associations which provide a strong foundation for realizing benefits of collective action. Karamoja Agro-business Association (KABA) which comprises bulking center operators, agro-dealers, progressive horticulture farmers and progressive block farmers. KABA covers all the four districts of Amudat, Moroto, Nakapiripirit and Napak

6.2.4. DIVERSIFIED INCOME SOURCES AND PRODUCTION SYSTEMS

Block farms have facilitated the multiplication of seed varieties new to the region. Notably cassava varieties. Adoption of cassava and sorghum as commercial crops is increasingly motivating more farmers in the much drier parts of Napak and Moroto to grow it at a large scale. Farmers have learned that cassava tubers can not only be converted into flour and fries, but have realized the stems are readily sold to other farmers as planting materials. The new varieties increase diversity in the production system while selling the stems diversifies incomes for the participating farmers. Bulking has enabled farmers to venture into produce trade and sale grains they were not selling before RWANU and earn more. This positively impacts on their adaptive capacity.

RWANU has supported introduction and scaling out of cassava varieties in the district (Views from a DAO).

Before RWANU it was rare to sell but would seldom sale maize. Now we sell maize, sorghum, bean, sunflower and green grams. Caritas approached us in February 2017, looking for 400 kg of sorghum, 400 kg of green grams, beans and groundnuts. We were able to sell 400kg of sorghum while we only supplied them with 200 kg of green grams (Kopukwa Bulking Group, Lorengchora, Napak district).

We are six members involved in the business. We have learnt the business culture. We buy grain so cheaply and sell later a very good price. Before RWANU we did not do this business (Kitongoethe FG Iriiri, Napak).

6.2.5. USE OF AGRICULTURAL PRACTICES AND TECHNOLOGY THAT ARE ADAPTED TO STRESSORS, AND ADAPTABLE

The block farmers plant improved varieties suitable to the region and use good agronomic practices (row planting, spacing, timely weeding, spraying to control field pests). The block farms are encouraging harmonization of production: use of simultaneous field activities uniform varieties, which ensure uniform maturity. The block farms have catalyzed increased acreage under resilient varieties and good agronomic practices. Higher earnings due to bulking catalyze adoption of resilient varieties, timely land preparation and timely planting to adapt to weather changes, and guarantee increase production and marketable surplus so as to continue to bulk.

To better prepare for shocks and stressors we engage in better agronomic practices which we hope will guarantee higher yields whereby some is stored for future consumption and also bulking in store. Learning the timing for planting has helped us to plan better. Clearing more land and accessing inputs allows us to produce more so as to withstand and respond to shocks and stressors now. Before RWANU we did not have this capacity. The quality of grains has improved. We sensitize members on the need to sort and clean their grain. We even have a sorting facility at the store (Kopukwa Bulking Group, Lorengchora, Napak district).

6.2.6. HOUSEHOLD ASSET BASE AND ACCESS TO FOOD

In one block farm group (Lokona FG, Namalu) members used part of the proceeds to buy cows, which they intend to multiply such that each member eventually owns a cow. No other cases of changes in asset base as a result of block farm and grain bulking interventions were recorded during this study. Although higher earnings from bulking can be used to acquire household assets this appears to have been limited by the quantities individuals bulked and reinvesting the individual proceeds in produce buying, other income generating activities and buying other food items.

Bulking centers increase food available in the area: The bulking groups hold the produce and sell to other community members during times of scarcity. Some of the groups also buy from other districts to sell to community members during the lean period. This improves availability of food in the region and distances community members have to travel to buy food which stood at 20 km before RWANU.

Block farmers share part of the produce for home consumption while part of it is sold. Findings

reveal that in some groups the produce would be stored together and members gradually share from time to time to address their household food needs. This gradual sharing ensures access to food over an extended period of time and minimizes risk of household members selling food for non-essential expenses like drinking. This positively impacts on households' absorptive capacities.

Sharing of produce from the block farms enhancing food availability in the member households.

We decided to invest part of the proceeds in cows such that they can multiply, and all members get cows (Lookana block farm group, Namalu, Nakapiripiriti).

Before RWANU there was little maneuver apart from doing wage work and gathering wild leaves to eat. But with RWANU bulking centre, there is plenty of food in the area because the bulking facility stores the food which people later buy (Kopukwa Bulking Group, Lorengechora, Napak district).

RWANU beneficiaries are more knowledgeable on how to produce more food notably the block farms which have enabled larger acreage and bigger harvest. The members have food reserves for the next season. Introduction of cassava has positively impacted on food security (Views of a District Agricultural Officer).

Before RWANU I used to cut trees and burn charcoal which I would take to Amudat trading center 18 km away on head. I would reach Amudat very tired and left with small quantity as I would leave some charcoal on the way not able to carry the entire load anymore. Now I do not have to burn charcoal to get food. I used to plant only maize on a small garden not even quarter of an acre because we were predominantly relying on cattle keeping. Now I have appreciated that growing crops is very important and helpful to our home hence I plant maize, beans, and sorghum. Last year I planted one acre of maize long 5 and harvested seven bags even when it was affected by the drought compared to at most 1.5 bags before RWANU. Now the food can take us to next harvest but it would get finished in December before RWANU. The harvest from the block farm has also helped a lot to smoothen consumption, and to get money to pay for scholastic materials and other school dues (Losaki David, Namalera Group, Komeret village, Moruita parish, Moruita sub-county, Nakapiripiriti district).

6.2.7. GAP AND REQUIRED ACTIONS TO STRENGTHEN RESILIENCE

One gap is the limited number of groups and members engaged in bulking. Not all groups bulk and not all members in the bulking groups engage in bulking. Likewise, even members that bulk still engage in side

selling, which limits the quantities bulked. Low production, risk averseness, absence of suitable and convenient decentralized collection centers for the individuals, concerns about safety of produce in the stores, limited appreciation of the costs of collective marketing/bulking are factors that still impair bulking efforts. Members of the block farms visited during the study did not bring the produce from their individual gardens to also bulk and sell it together with that from the block farm.

- i. Future programs should continue to sensitize members of the FTGs on the costs and benefits of bulking.
- ii. Future programs should strengthen bulking groups capacity for market intelligence. Seek market information on prices, production trends and be able to use it to determine when they should sell. Produce prices rise and fall hence the groups should be able to judge at what point prices are likely to fall.
- iii. Linking the bulking groups that are also engaged in produce buying to financial service providers like CERUDEB to access produce marketing loans which would enable them to increase quantities handled, and be able to resale to community members.

Sustainability: Although some block farm groups were dogged by lack of cohesion and commitment among some members, there has been a reorganization within the groups operating now. The block farm groups visited were continuing with the activity with their own resources. It is apparent that these are likely to continue working together even after end of RWANU. Getting a good harvest will increase odds of the groups continuing to work together. Block farms will continue among members that are business oriented towards bulking.

Member of the bulking centers also noted that they will continue to bulk and encourage other members to bulk. Venturing into produce buying from other farmers widens the income streams of members and appears to provide an impetus for members to continue with the groups. The clear record keeping procedures that ensure accountability and transparency are critical to strengthening trust in the system and hence offer a good foundation for its continued use. Increasing quantities bulked would enhance access to big buyers, better prices and hence more earnings for the members. The groups will need to institute measures to minimize side selling among the current members and encourage other people to join.

6.3. IMPACT OF BULK GRAIN MARKETING AND BLOCK FARMING ON MARKET RESILIENCE

6.3.1. DIVERSITY OF RELATED PRODUCTS AND DIVERSE MARKET CHANNELS

Members in the groups that bulked reported selling maize, sorghum, green grams, and groundnuts. These groups were not involved in collective grain marketing prior to RWANU. The groups reported selling to traders from within and outside the district who resell to other individuals, and community members within the localities. The bulking groups also buy from other farmers and resell the grain to individual community members as food during times of scarcity. This has enabled the groups to widen market access through selling to different channels. During times of scarcity some bulking centers also buy from other places to sell to locals at retail for food.

6.3.2. REDUNDANCY OF MULTIPLE BUYERS, SELLERS AND SERVICE PROVIDERS

Many buyers offer increase options groups can sell to. Prior to RWANU farmers sold their produce individually to middlemen at farm gate or to other traders and farmers during the periodic markets. The gain bulking groups reported having many buyers who approach them for the produce. This provides alternatives hence sale to the ones offering higher price. Improvement of the road connecting to the region is noted to

have contributed to increase in number of buyers. Community members who buy grain for food from the bulking centers increase the number of buyers available to the groups. Mixed results were found in case of the block farmer groups. Those close to trading centers reported getting many buyers who come to buy directly from their store, while those deep in the villages transport the produce and sell to traders in district towns or periodic markets.

We sold to traders coming outside the district from Mbale and Soroti. Emergence of big buyers like Caritas offers an opportunity to sell larger quantities (Kopukwa Bulking Group, Lorengechora, Napak district).

RWANU bulking groups had a lot of demand from farmers who lacked food and other traders (grain buyer Iriiri, Napak).

We sell to a buyer who offers the highest price (Kitongoethe FG, Iriiri, Napak).

We sold to buyers from other sub-counties (Lorachat, Takola, Nakapiripiriti town) in the district. They came for the produce at our store (Block farm members Lookana FG, Namalu, Nakapiripiriti).

6.3.3. TRUSTING RELATIONSHIPS THAT ALLOW COOPERATION, COMMUNICATION, LEARNING AND INNOVATION

Bulking centers support members to bulk quality produce: RWANU trained the collective grain marketing groups to establish structures that ensure smooth running of the bulking centers. Bulking centers established marketing committees that check the quality of produce delivered by the member. In cases produce delivered is not clean, the farmer is advised to first clean it on the table or dry it on the tarpaulin. Then kilos of the clean and dry produce weighed, recorded and indicated on the goods received notes. Bags delivered by members are labeled to enhance traceability. Accountability is enhanced at the collection center through keeping of records to ensure sale and purchases are tracked in the right way. Before selling produce, meetings are organized to agree and set the selling price. Some block farm groups entrust marketing of the produce to a few of their members who take the produce to buyers in periodic markets or district towns, sale then return the money to the group. No evidence of block farms impacting on market relationships that support learning and innovation was recorded in this study.

We encourage our members to supply quality produce. We have the cleaning table and tarpaulins which they use to clean or dry their produce if what is brought is not good quality (Kopukwa Bulking Group, Lorengechora, Napak district).

We assign some members to take the produce to buyers in the periodic market in Moruita or Amudat). They sell and bring the money to the group (Namalera block farm group).

6.3.4. MARKET GOVERNANCE AND POLICY ENVIRONMENT CHARACTERIZED BY TRANSPARENCY, EQUITY AND CONSISTENCY

RWANU supported the bulking centers with equipment like information boards, weighing scales that enable standardization of measurements and increase transparency. Produce delivered at the bulking centers is weighed, recorded and the member given a goods received note specifying the commodity, quantity and date it is delivered. Produce is sold using standard measurements unlike before when they would sell using various non-standard containers.

Bulking center marketing committees look for buyers, and search for market information. The groups indicate the quantities available and the prevailing prices on the white boards. Market information displayed on the whiteboards at the bulking centers facilitate farmer access to information and hence making of informed decisions with regards to when to sale. Potential buyers also get to know the quantities available and the price at which the group is offering its produce. They engage in seeking market information from FM radio stations as well as through market visits. This enables the groups to engage with the buyers from an informed position.

Bulking groups have adopted first in first out policy so as to ensure that members who bulked first, it is their produce that is given chance to be sold first once there is agreement on the buyer and price.

Every member is responsible for looking for information on market and share it with others. We go to markets and also contact other friends so as to get market information. The information is written on the white board where both the buyers and members are able to know the prices (Kopukwa Bulking Group, Lorengechora, Napak district).

Each time five members go to the market to establish market information and then share with rest of the groups (Lokona FG, Namalu Nakapiripiriti district).

6.3.5. GAPS AND ACTIONS NEEDED TO STRENGTHEN RESILIENCE

Weak or no linkages with specific buyers: Both grain bulking and block farm groups currently sell to any buyer who comes and offers a price acceptable to the group. This is fine during times of scarcity but could expose the groups to losses during times low prices. Future programs should support the bulking centers to establish links with specific buyers, and where possible support them to engage in forward contracting arrangements.

Limited use of Information Communication Technologies (ICTs) to access market information: Bulking groups reported sourcing market information from FM radio stations. However, mobile phones are a resource that would support groups to access location specific market information from available service providers. Future programs should sensitize and build capacity of collective marketing group members on use of mobile phones to access market information.

Lack of incentives to people charged with marketing and other responsibilities: The groups assign responsibilities to particular individuals to look for market information, search for buyers, or market the produce on behalf of the group. Such members serve on a voluntary basis, this exposes groups to risk of some duties not being done when fatigue sets in due to lack of incentives as voluntarism is not sustainable. Future programs should sensitize the collective marketing groups to appreciate the costs involved in searching for market information and get the groups to put aside resources to support those functions.

6.3.6. SUSTAINABILITY

Big buyers and traders have started engaging with the groups, which provides a foundation for building confidence and trust. Improvements in the condition of the road linking Karamoja to Soroti is likely to bring in more buyers which will increase competition for produce. Bulking centers have ventured in purchasing produce from other areas to sell on retail basis to community members during times of food scarcity in the region. This widens their income streams, allowing the centers to operate during the off season and offers a foundation for their continued existence. Bulking centers have put in place structures that ensure delivery of quality produce, proper record keeping and sharing of market information. Such structures provide a basis for continued supply of quality produce which will attract buyers, and also access to information to make informed decisions.

7. HONEY VALUE CHAIN DEVELOPMENT

Summary findings: Honey production has increased the income sources for the households that ventured into it due to RWANU interventions. It has brought higher incomes for those that were already engaged in the activity due to increased production triggered by use of better hives, apiary management and harvesting practices. The intervention enabled households to diversify income to mitigate risk which positively impacts on their adaptive capacities. However, increment in incomes was from very low levels and impact is limited by low scale of investment, coverage, and seasonality.

The drought of 2016 drastically affected quantities produced and hence earnings from honey. Some households did not harvest any honey in 2016 and early in 2017.

RWANU has promoted capacity building of communities in honey production. Trained honey Community Based Facilitators, and artisans facilitate continued farmer access to knowledge on apiary management and modern hives made with locally available materials. These are a resource that will continue to be used by the community members well after end of RWANU. Honey producers acquired knowledge on siting, baiting hives to enhance their colonization, pest management in apiary, and processing. Provision of starter kits and hives has facilitated farmer use of technologies in honey production. This has spurred participation of women in an activity that was previously the domain of men. Groups work together in setting up and managing the apiary sites which increases their social capital and shared learning.

The market has been strengthened and streamlined. Entry of Golden Bees in the value chain has facilitated farmer access to technical knowledge that they may not have got. This increases their ability to learn and innovate. Honey is now bought using standard measurements, and presence of many buyers has facilitated increase in prices from below UGX 3000 in 2014 to UGX 7000-8000 in 2017. It is highly likely that farmers will continue to engage in honey production and the buyers will also continue to operate in the region. Golden Bees established an outlet in Moroto, there is a local buyer in Iriiri, Napak and also in Karita who process, packs and sell in Kampala, while other buyers come from Kenya.

The limited number of farmers engaged in honey production coupled with small number of hives owned by each farmer limit household-level impacts from the honey value chain. Golden Bees has not yet reached and created rapport with all beekeepers, a move that would increase market resilience.

7.1. DESCRIPTION OF THE HONEY VALUE CHAIN DEVELOPMENT INTERVENTION

Honey value chain development focused on facilitating adoption of beekeeping, improved practices and increased linkages to output markets. The program targeted 810 honey producers (486 men and 324 women) in 40 groups. Activities included training Community Based Facilitators (CBFs) in beekeeping, training local artisans on making of low cost beehives, supporting farmers with starter kits, facilitating farmer participation in exposure events like field days, and trade fairs and linking the bee keepers to a national buyer.

Achievement include training of 40 (36 male, 4 female) CBFs and 16 local artisans on beehive production. The CBFs were equipped with the knowledge and skills so as to serve as community based beekeeping extension workers to improve production, quality assurance, and marketing thereby supporting building community capacity to effectively manage apiary activities. Training locals engaged in carpentry and woodwork was conducted in collaboration with Golden Bees Ltd. The project provided starter kits to 40 CBFs and supported 60 beekeepers to participate in exposure events where they exhibited their work during Moroto district trade fair and sent a representative to Apiary Expo in Rwanda for purposes of facilitating market linkages and information sharing.

In collaboration with Golden Bees, the project trained 120 apiary farmers (98 men and 22 women) from 34 groups on the appropriate apiary management practices and making transitional Kenyan Top Bar (KTB) hives

using locally available materials to increase honey production. Farmers were also trained on pest management to maximize quality and quantity of yield for their advantage.

Training, monitoring visits, and coaching was provided to 35 apiary groups. RWANU trained 72 selected farmers (59 males; 13 females) on processing methods, types of equipment used, conflict management, and record keeping. Four groups were supplied with honey processing equipment as part of the program exit strategy.

7.2. IMPACT OF HONEY VALUE CHAIN DEVELOPMENT ON HOUSEHOLD RESILIENCE

7.2.1. ACCESS TO PROFITABLE OUTPUT MARKETS, AFFORDABLE INPUTS AND SERVICES, EXTENSION, AND AFFORDABLE CREDIT

Bee keepers selling honey at premium prices: Prior to RWANU beekeepers sold their honey individually to other community members or hawked it in periodic markets. RWANU facilitated linkages with Golden Bees, which buys honey from different parts of the country. Golden Bees offered to buy honey at a higher price and this has been replicated by other buyers. Honey producers now sell their honey collectively to a reliable buyer, use standard measurements and get premium prices increasing their earning from the activity. Honey prices increased from UGX1500 /kg (USD 0.42) before RWANU to 5000/kg (USD 1.41) in 2015 to UGX 6000/kg (USD 1.69) in 2016 and UGX 7500/kg (USD 2.11) in 2017. In addition, Golden Bees offers training to the bee keepers on apiary management and processing enhancing sustainable access to extension.

RWANU strengthened capacity of community members in bee keeping. The CBFs are an extension resource that will continue to provide information to community members. Participants in FGDs and in-depth interviews acknowledged having access training from RWANU and cited acquisition of knowledge on better apiary management practices (siting, pest management, baiting to hasten colonization and proper harvesting). Training of the local artisans and farmers in fabrication of low cost beehives using locally available materials will ensure continued availability of the improved hives locally. Project annual report FY 2016, indicate that the trained local artisans had sold 93 pieces of locally manufactured Modern Kenyan Top Bar hives. Farmers acknowledged sharing of information on making and increasing the number of bee hives.

The study did not capture evidence on impact of honey value chain development on access to affordable credit. This notwithstanding honey has potential to positively impact access to affordable credit when bee keepers start saving part of the proceeds from honey in ASCAs.

Before RWANU we used to sell to Kenyan traders who would be identified randomly. We were selling individually as producers. There were no standard measurements used but just using eyes to estimate, there was no defined way of determining prices and we used to hawk the honey to look for buyers. After RWANU we bulk our honey and sell as a group. We sell to 2 buyers Golden Bees and another buyer in Karita TC. Honey is measured in Kilograms and each farmer's honey is recorded. Now we sell the honey with the combs which brings a higher value from the honey. We are paid cash for own honey and a higher price now. For instance a full bucket of approximately 20 kgs was sold at 30,000 (USD 8.45) before RWANU but with bulking the same bucket is now sold at 145,600/=UGX shs (USD 41.01) (Chomwogh male group).

We have a better market for our honey using RWANU's links (Mwoto FG, Lokeles, Karita, Amudat)

In 2015 I got a good harvest and sold honey to Golden Bees. Their agent collected the honey from the collection centre. Too much drought affected honey production in 2016 and early this year (Losaki David, Namalera, Moruita, Nakapiripiriti).

The trained artisans are making hives and independently supplying other community members and projects. We set established an outlet in Moroto town from where we buy the honey. In Karita we take advantage of market days when many vehicles go there to also go and collect the honey. In 2014 we only bought two tons as production was low due to lack of technical skills. After training, production rose and we bought 15 tons in 2015, at UGX 5000/kg (USD 1.41). The drought in 2016 affected honey production and we were only able to buy six tons. Price increased to UGX 6000/kg (USD 1.69) of honey (national honey buyer).

7.2.2. WOMEN'S PARTICIPATION IN DECISION-MAKING, INCOME GENERATION AND INCOME ALLOCATION

Project support to beekeepers has enabled women to engage in beekeeping, which FGD participants noted was predominantly a domain of men. The introduction of modern tools used in apiary management (bee suits, masks and use of smokers), addressed some key barriers that were hindering women's participation in honey production. Previously one had to roll in mud to create a protective barrier, carry fire, and then climb a tree in the middle of the night to collect the honey. All these were not convenient for women. Now the hives are fastened with wires and are not hanging too high for one to harvest while standing. Also the protective gear and smokers make it safe to harvest the honey.

We got introduced to beekeeping. Previously only men had beehives. (Participants in FGD with Women member of Chomugh, Compas, Losidok, Karita, Amudat).

I now own a KTB hive given to me by RWANU before it was only my husband who had 5 local hives. Training has enabled me to acquire knowledge on honey (Chepchock Celina, Chomwogh FG, Compas, Karita Amudat).

I was not involved in bee keeping before. How could an old woman climb trees to harvest honey in the night. Now there are tools to help and the hive is not place too high in the branches. I have one bee hive given by RWANU (Zipola Chepsangayi, Motwo FG, Lokales, Karita Amudat).

Ownership of the bee hives has involved women in an additional income-generating activity over which they have control. However, scale of investment limits the incomes women generate from this activity. Those interviewed during the in-depth discussions had not increased on the number of hives from the one given by the project.

7.2.3. SOCIAL AND ECONOMIC NETWORKS

Working in groups is fostering shared learning and sharing of honey harvesting tools and equipment. The group members site the hives in the same place thereby ensuring cooperation and learning from one another in the management of the apiary, as well as reciprocal support during harvesting. This bonding social capital has strengthened the members' capacities to cope and recover. For instance, when charcoal burners cut trees where the group had sited their apiary, members worked together to shift the hives to another location.

Linking social capital. Honey groups utilize their bridging social capital to access and share information with other groups. Groups have established links with other apiary groups with which they share market information on prices and harvest. It is men who know the links because they move from market to market. Mobility of women limiting/impairing their bridging social capital in which case they have to rely on men in their groups. The interface with Golden bees has enabled farmers to access technical backstopping and information which would otherwise not be available locally.

Apiary sitting is done together with the other group members. The group has worked together to shift location of the bee hives on 3 occasions after the sites are affected by people who cut trees for charcoal (*Zipola Chepsangayi, Motwo FG, Lokales, Karita Amudat*).

We have established linkages with other apiary groups with which we share knowledge on protecting bee hives; as well as ways making and increasing number of bee hives (*Motwo FG, Lokeles, Karita, Amudat*)

We provided training to the apiary groups on making modern hives using local materials, apiary siting, pest control and harvesting of honey (*Honey buyer*).

RWANU has catalyzed formation of honey producer associations which provide a strong foundation for realizing benefits of collective action. The four association include:

- i. Karita Environmental Management Community and Honey Association (KA'EMCHA) for Amudat district.
- ii. Pian Honey-one (PHONE) for honey producers in Nakapiripirit district
- iii. Napak Apiary Management Association (NAAMA) for honey producers in Napak
- iv. Toyara kaagongong Honey Producer Association Network (TOHOPAN)

7.2.4. DIVERSIFIED INCOME SOURCES AND PRODUCTION SYSTEMS

Honey production and marketing has enabled increased incomes for those who had beehives before and diversification of income sources for those who ventured in the activity after RWANU, notably women. This has increased household's absorptive capacity as reported by FGD participants that they relied on incomes from selling honey to buy food and other necessities. Likewise, it has positively impacted on household adaptive capacity when they use proceeds from honey to increase savings in ASCAs and investing in buying quality seeds.

We used income from honey to increase savings with the ASCA so that we able to borrow when times are had so as to buy food. (FGD participants with men members of Chomwogh group, Compas village, Losidok parish Karita sub-county Amudat district).

Honey production has led to increased incomes which is used for school fees, buying food and investing in farming by buying seeds.

Our incomes have greatly improved because we are able to earn more from producing more honey (FGD participants Mwoto group Agule, Lokales Parish Karita Amudat district).

7.2.5. USE OF AGRICULTURAL PRACTICES AND TECHNOLOGY THAT ARE ADAPTED TO STRESSORS, AND ADAPTABLE

Honey farmers have moved from traditional beehives to improved ones. Farmers acquired skills of making KTB hives using locally available materials. Findings from the project annual reports reveal that 8 farmers replicated the KTB hive and sited 11 of them after the training in 2016. Beekeepers have adopted modern techniques for processing honey that minimize harm to the bees also enhance quality of the harvested product. FGD participants noted that these methods safeguard the bee population allowing them to quickly embark on making honey after harvesting unlike before when most of the bees would be killed in the harvesting process.

Before RWANU we were using local methods of putting fire, then pounding which would kill the bees. After RWANU we use gloves and cloth to get the honey without killing the bees. Today we sell the honey with the combs. We are now better equipped and efficient, do not kill the bees, and get better quality and quantity (FGD participants with male members of Chomwogh group, Compas village, Losidok parish Karita sub-county Amudat district).

Quality of honey from Karamoja is good, due to the trained bee keepers and use of good equipment for harvesting the honey, they do not harm the bees (national honey buyer).

7.2.6. HOUSEHOLD ASSET BASE AND ACCESS TO FOOD

Project support have facilitated ownership of modern hives in households with women also owning hives. The hive is a productive resource which enables households to diversity livelihood strategies. Proceeds from honey used to buy food and some of the honey used in the home.

RWANU helped a lot in giving out hives to farmers. The ones they had before were already spoilt. Now I buy a lot of honey from RWANU beneficiaries (Local honey buyer Iriiri).

Through RWANU we supplied over 600 KTB hives, four sets of processing equipment for supporting honey production (national honey buyer).

Now I harvest more honey compared to before RWANU. I got 10 kg of honey in 2015 compared to at most four before RWANU. The price for honey has also increased from UGX 3000 to UGX 5000 per kg. I used the proceeds to buy food and pay for school fees (Celina Chepchock Compas Karita, Amudat).

7.3. IMPACT HONEY VALUE CHAIN DEVELOP ON MARKET RESILIENCE

7.3.1. DIVERSITY OF RELATED PRODUCTS AND DIVERSE MARKET CHANNELS

Golden Bees buys the honey in combs and pollen. The company processes and sells honey, propolis, beeswax, and bee venom. It supplies up to 40 supermarkets in Kampala. It is in the process of supplying a supermarket in Kenya. Farmers in Karita Amudat also sell to buyers from Kenya while those in Napak, notably Iriiri sell to a local buyer who in turn processes, packs and sell to outlets in Kampala. FGD participants reported selling honey in combs to Golden Bees, but also sell to local buyer in Karita trading center, buyers from Kenya and Iriiri trading centre for those in Napak.

7.3.2. REDUNDANCY OF MULTIPLE BUYERS, SELLERS AND SERVICE PROVIDERS

RWANU linked honey producers and Golden Bees, which offered to buy honey at premium prices. Entry of Golden Bees in honey market in Karamoja influenced other buyers to also pay higher prices. Competition for honey between Golden Bees and other buyers from Kenya contributed to increase the prices paid for honey. In 2015 Golden bees bought honey from Karamoja at UGX 5000/kg (USD 1.41) but subsequently increased the price to UGX 6000 (USD 1.69) in 2016. Bee keepers reported selling honey between UGX 7500-8000/kg (USD 2.11-2.25) in 2017 having increased from UGX 3,000 (USD 0.85) before RWANU. Trained artisans supplying beehives to beneficiaries of other development agencies. This has widened the products they make and hence their income streams.

7.3.3. TRUSTING RELATIONSHIPS THAT ALLOW COOPERATION, COMMUNICATION, LEARNING AND INNOVATION

RWANU facilitated business talks between Golden Bees Ltd. and honey producer groups. A total of 42 (29 female, 13 male) apiary farmers attended. Golden Bees Ltd. outlined the quality standards for honey purchased and the price offered for a kilogram of honey and that of pollen. The quality expectations included ripe honey, dried in clean airtight buckets, stored at room temperature, and free from pollen. Golden Bees established a physical presence in form of a honey collection center in Moroto town where farmers in that district deliver the honey. For producers in Amudat, the company takes advantage of market days to organize mobile collection centers where farmers deliver the honey. Honey producers reported collective selling of their honey to Golden Bees, which pays the agreed price. Through this arrangement, honey producer groups are assured of market access at a premium prices and Golden Bees is assured of quality honey. As mentioned earlier Golden Bees also trains farmers on apiary management and processing which enhance their ability for learning and innovation.

7.3.4. MARKET GOVERNANCE AND POLICY ENVIRONMENT CHARACTERIZED BY TRANSPARENCY, EQUITY AND CONSISTENCY

The entry of Golden Bees in the honey value chain in Karamoja facilitated change to use of standardized measurements in buying of honey. As mentioned earlier, previously farmers would sell in containers and only use eyes to judge the quantities. Now honey is sold in kilograms to all the various buyers.

RWANU facilitated business talks between honey producers and Golden Bees. During these discussions Golden Bees communicated the price the company was offering for the honey and the expected quality standards to the farmers. To ascertain adherence to quality standards Golden Bees use refractometers to test the water content in the honey at the time of buying from the farmers. Honey producers who sell to other buyers negotiate the price with them using the price offered by Golden Bees as the indicative minimum price.

Uganda Bureau of Standards conducts more specialized quality tests (electric conductivity, water content, acidity, HMF) on the honey. Golden Bees took a sample of honey from Karamoja and it passed quality tests conducted by UNBS. The company is now processing to get quality certification so as to be able to supply its honey outside Uganda notably to Kenya, and later after getting ISO certification, to countries outside Africa.

7.3.5. GAPS AND WHAT NEEDS TO BE DONE TO FURTHER STRENGTHEN RESILIENCE,

Charcoal burning is interfering with apiary sites, reducing tree coverage leading to inadequate forage for the bees and hence affecting honey production. RWANU has encouraged planting of bee forage to supplement the natural trees available within the apiaries but termites have been a problem. Future programs should:

- i. Intensify promotion of planting trees on farm using species that are adapted to the environment and also resistant/tolerant to termite attacks. Promote technologies for termite control;
- ii. Engage in advocacy for enforcing natural resource management policies which would curb on charcoal burning; and
- iii. Continue to promote livelihood strategies that are not destructive to the environment.

Limited number of farmers engaged in beekeeping and low level of investment: The number of hives owned by farmers is still low. Future programs should continue to nurture and promote beekeeping as a viable income generating activity for the farmers. Options include:

- i. Supporting increase in the number of beehives owned by the current beekeepers, and encouraging more households to engage in bee keeping. Interventions to attract more farmers to beekeeping and encouraging those already engaged in the activity to scale up their investment. Awareness creation on the potential and economic viability of honey production as a livelihood strategy in the region.
- ii. Supporting bee keeping extension services and technical backstopping to the beekeeping CBFs of the beekeepers. Someone who visits the farmers and provides on spot advice after checking on the apiary sites.

Golden Bees has not directly reached, interacted with and registered all the bee keepers that have benefited from RWANU. It worked with group representatives and in some instances no contact were retained. Future programs should support development of close interaction and establishment of rapport between the farmer groups and staff of Golden Bees. Introduce Golden Bees to all farmers engaged in bee-keeping. This can be pegged on other activities undertaken by the program which require the groups to come together.

The established honey producer associations are still young and inexperienced. Future programs should continue to nurture growth of the honey producer associations and strengthen their capacity to effectively represent the voice and interests of their members.

7.3.6. SUSTAINABILITY

Golden Bees recognizes that their survival hinges on having a stable supply chain from the smallholder beekeepers. The company has installed processing capacity to handle up to 10 tons of honey per day and has plans to expand its market to supermarkets in Kenya, Europe and Asia. The company established a physical presence in the region, local buyer who process, pack and sell in Kampala have emerged in Iriiri, Napak and in Karita, while other buyers come from Kenya. Golden Bees and the interviewed local buyer noted that they will continue to buy honey from the region well beyond end of RWANU. It is highly likely that Golden Bees and other buyers will also continue to operate in the region, buy honey in kilos which increases transparency on quantities, and offer premium prices.

8. IMPACT OF PROJECT INTERVENTION ON HOUSEHOLD RESILIENCE, FOOD SECURITY AND NUTRITION

8.1. IMPACT ON HOUSEHOLD RESILIENCE

Summary findings: RWANU has strengthened household resilience. It has facilitated farmers to access inputs of their choice, adoption of suitable technologies and practices as well as expansion of acreage albeit from very low levels. This has triggered increased production and yields in the face of erratic rains hence increasing food availability. Increased access to livestock inputs and services and farmer adoption of livestock health management practices has reduced death of animals, improved performance of the herds and strengthened farmer capacity to withstand shocks and stressors.

The ASCAs have provided a reliable source of credit and mobilization of savings that support consumption smoothing, protect assets, support investment in other income generating activities, and allow households to hold on to produce to sale later at higher prices. Block farms and grain bulking has enabled farmers to get higher earnings from their produce. Multi-prolonged approach has supported acquisition of knowledge and engaging in several enterprises that provide multiple sources of incomes. The diversified income sources have contributed to reduced reliance on coping strategies that are destructive to the environment. Project interventions have strengthened social capital among beneficiaries which facilitates access to new knowledge, and resources they would not have got. The project has spurred increase in household assets that support wealth generation and accumulation.

Description of impacts on household resilience

RWANU market interventions notably capacity building for improved food production, demonstration and the block farmers has stimulated increased appreciation of crop production as a viable and important livelihood strategy. The baseline report noted that the shift to agriculture as a primary form of livelihood is a recent trend in Karamoja. Project market interventions facilitated farmers to access inputs of their choice, adoption of suitable technologies and practices as well as expansion of acreage albeit from very low levels. This has triggered increased production and productivity in the face of erratic rains and enhanced households' ability

to keep food reserves as observed by participants in the FGDs and in-depth interviews with beneficiary farmers

The increased production has enabled me to have food in store and more income from the brewing business. Increasing acreage and use of better variety will enable me to get more yields. I now have goats, goats and cows which can be sold in case of serious food shortage (*Teddy Akol Lokana FG, Namalu, Nakapiripiriti*)

Now we can store some extra grain for at least four month, then when problems occur we sale some and put the money in the saving box, then we divide some of the food among themselves (**Namalera Block farm group**).

Were able to store some food especially maize to safe guard against future scarcity. However floods and drought still affect the production.

We acquired oxen after selling cassava, hence this has enabled fast opening of the land and increased acreage, timely planting, contributing to better yields. Now at least food takes you to next season and you plant new crops. Still has sorghum in store which will take me up to August. Previous we would have to migrate to Serere whenever there was a drought, and food shortages, then you would not be able to plant your own crops in time. Access to loans and savings from the ASCA has enable me to hire labour for weeding, and access money for treating animals which ensure increased production also. The ASCA helps a lot to get money to address your pressing need, either you are sick, or animals are sick and you pay latter. The ASCA money is available you do not have to waste time moving around looking for buyers for the chicken. Now you donot have to sale your chicken cheaply (*Catherine Marang, Lokungurit, Lorengechora, Napak*)

Access to livestock inputs and services coupled with farmer adoption of livestock health management practices has improved performance of the herds and strengthened farmer capacity to with stand shocks and stressors.

Increased survival of goats enables us to be better prepared to withstand shocks as we can sell and address cash needs and also by food(*Celina Chepchock, Compas, Karita Amudat*).

The ASCAs have provided a reliable source to access credit and mobilization of savings that support

- Consumption smoothening. This enhances households' ability to respond to family emergencies and pressing needs for cash, as well as buying food.
- Stop distress sale of livestock and produce allowing farmers to sale later at better prices Although borrow for consumption smoothening is expense debt that would make the households more vulnerable, it has in effect checked distress sale of livestock which would have contributed to asset depletion and allowed households to hold on to their produce to sell it later at higher.
- Investment in other income generating activities. However, amount of total saving in some groups is still small to support bigger investments.

Increased savings with ASCA so we are able to borrow when times are hard, so as to buy food (ToTo ASCA, Chomugh)

Before RWANU we could sell some of the animals cheaply to buy food. Borrow from ASCA and use profits to buy assets like goats which will be sold to earn income for food in future because goats multiply very quickly (Lokungirit WLG, ToTo ASCA)

The ASCA enabled me to buy more goats and plant improved seed which helped me to harvest some 5 bags of maize despite the drought, and also plant cabbage and watermelon (Celina Chepchock, Compas, Karita Amudat)

The ASCA has enabled easier access to credit which enables one to solve an immediate problem including buying food and payment of school fees. I also borrow to do some trading which has increased the incomes (Women member of Kitongoethe FG, Iriiri Napak).

The women in VSLAs have raised the pride of women and has given them control of assets in the homes as well as self-esteem. women take decisions and have leadership positions within the groups. Widows' capacities to provide for their households has been raised (Views of District Commercial Officer).

Multi-prolonged approach has supported acquisition of knowledge on a number of enterprises that provide multiple sources of incomes. Better management of activities previously engaged in for instance livestock health management, growing of improved varieties and agronomic practices. This has enabled households to diversify their sources of income and hence risk. The diversified sources of income include vegetables production, honey production, bulking and marketing of grain, livestock trading, expanding crop production, petty trade. The grant supported enterprises also provide alternative source of income for the women and youth in such groups.

The diversified income sources have contributed to reduced reliance on coping strategies that are destructive to the environment notably charcoal burning among project beneficiaries. There is an improvement from the baseline situation when across the region, it was noted that there were only a few sources individuals could get income from, identifying six primary sources of income at the time: making charcoal, gathering firewood, producing local brew, engaging in small-scale agricultural production (both the sale of crops and animal rearing), working as hired labor in private gardens, and "casual labor."

Income generation that has been influenced by RWANU interventions especially those that promote business activities help people to have alternative sources of income. These small business help the households especially women to raise income which they mainly spend on food when times get hard. However, the overall impact is limited considering that such changes in income are small and for some not regular (Views of District Commercial Officer).

As a group we intend to buy food in November when prices of cereals are still very low and then stock the cereals to use in future when there is scarcity of food. We will use the savings and profit from the grant to do this (FGD participants from Kanakomol).

Now days we buy sorghum after selling cows and store to wait for the lean seasons. We store in the granary (Kanegu Livestock trading group, Naduget, Moroto).

Investing in small business helps to us to overcome effects of shocks, there is always some money for emergencies (ToTo ASCA).

Investing proceeds from petty business, & honey production into farming (buying seeds, tractor hire services and labor in case of crop production and livestock drugs (Chomugh FG Compas, Karita Amudat).

RWANU market interventions have strengthened social capital among beneficiaries which is facilitating access to new knowledge, resources (e.g, labor sharing, opportunities and services. Working together in a group is a

strong mechanism to pull their resources together and improve efficiency of the processes. The block farms, bulking centers, business development support grants to youth and women, WLG, ASCAs, honey groups establishment and management of common apiaries have helped to strengthen bonding social capital among members. The joint initiatives have enabled members to access support, information and enhance shared learning. It positively impacts on household ability to absorb and adapt to the shocks and stressors.

Program interventions have spurred increase in household assets that support wealth generation and accumulation. Some households received goats, oxen and ox-ploughs, drip irrigation equipment, hives from the project. Likewise, some households have used loans accessed from the ASCAs, and or income from produce sales, higher prices earned through bulking centers to buy productive assets. Adoption of livestock health management practices coupled with access to the inputs and services has reduced losses and improved performance of the herds.

RWANU has strengthened capacity of households notably women to own assets (Views of a DCO).

Increased number of goats hence can sale in case of a shock. Wife got 6 goats from RWANU but now we have 24 (Lote Sisto CAHW and husband to a WLG beneficiary, Loregendwat, Nakapiripiriti).

Increased cooperation between couples, joint involvement in production activities. Men that were previously not supporting their women in crop production activities now work together with them in the fields. This contributes to increased acreage, and timely undertaking of activities which in turn lead to increased production, availability of food and income to support the household.

Gaps and what needs to be done to strengthen resilience

- Addressing challenges posed by water during the wet and dry periods. Water logging and flooding of gardens continues to be a major challenge affecting crop production during the rainy season. Likewise water stress at critical periods of crop growth continue to limit increased production in the region. Lack of access to water also affects livestock production. RWANU strengthened farmer capacity to construct soil bands to improve its moisture holding capacity but this falls short given the levels of water logging in the area. The interventions required to address these challenges are beyond capacity of the households and call for supporting community level infrastructure to hold the water during the rainy season and avail it for crop and livestock production during the dry season. This would also benefit honey production.
- Position the groups to lobby for support from government programs (Youth Livelihoods Program, Women support fund) and other development partners
- Promote poultry production
- Closer engagement with financial service providers and other government programs.
 - Closer engagement with the financial service provider will facilitate linkages for the ASCAs, to ensure access to sustainable capacity building, access to products notably from Micro-Finance Support Centre and the private sector)
 - Linkages to existing government programs designed to scale out financial inclusion for the rural areas eg Project for Financial Inclusion in Rural Areas (PROFIRA)
- Support literacy and numeracy. This would also improve the way the groups run their ASCAs, bulking and other businesses engaged in by the groups; enhance transparency as more people would be able to read and understand records kept by their groups

- **Tackling Acoholism.** Alcoholism has been highlighted as the second most common cause of death in Karamoja. It has profound effect on peoples' engagement in productive activities as well as impairing their ability to provide proper care for children. In the villages, commerce closes around 2:00 pm as by that time most people are drunk. This calls for a multi-pronged approach with messaging to influence behavioral change. Options include radio spots, drive in around communities with loud speakers relaying the messages, drama, and use of community based change agents.

8.2.IMPACT ON MARKET SYSTEM RESILIENCE

The market system has grown, diversified and gained capacity at the same time. The commercial input supply network in southern Karamoja only emerged with support of RWANU. Agro dealers stock a range of inputs which gives farmers options to choose from. The agro dealers and CAHWs have facilitated increased access to inputs, advice, and services. They are a source of advice to farmers which provides a foundation for sustainable access to information, leaning and innovation. Strengthening of market led service provision (agro dealers, CAHWs, tillage service providers, produce buyers) has enhanced access to support services that re-enforce farmers' capacity to maximize gains from the market. Project interventions have increased farmer capacity to take advantage of market opportunities through collective action.

RWANU has reached out to other actors in the region to use the agro-vet dealers as opposed to establishing parallel structures which would weaken the system. Local agro-dealers have established relations with suppliers which facilitate faster stocking of inputs. They send orders and money electronically and the suppliers send the consignment by bus hence the agro-dealers do not have to travel to the physical location of suppliers in order to stock inputs. The relations enable some local agro-dealers to get inputs on credit from suppliers. National seed companies such as FICA, Victoria Seeds, and Equator seeds are collaborating with local agro dealers to stimulate demand for improved seeds through establishment of demonstration sites for new varieties and hosting farmer field days at these sites. Trusting relationships are also emerging between the agro-dealers and farmers. Agro-dealers offer advice to farmers and also credit to trusted customers.

RWANU interventions have strengthened agro dealer capacity to identify, stock, and supply quality inputs to farmers. They are aware of the brands supplied by genuine suppliers, and measures to use to ascertain quality of the inputs. These include, checking for manufacturing and expiry dates, e-scratch, conducting germination tests, and checking the blue labels issued National Seed Certification Service (NSCS) under MAAIF by the on seeds packets. The partnerships between the agro dealers, and suppliers on one side, the public veterinary service providers and the CAHWs in case of livestock provide a strong foundation for sustainable farmer access to livestock health services. It is our view that agro dealers and CAHWs will continue to provide services to farmers. The agro dealer have taken advantage of RWANU to increase their capacities to supply inputs. Farmers have appreciated the improved varieties and are likely to continue to use them with the associated production practices.

Bulking groups that only emerged with RWANU's support are now selling up to 5 commodities (maize, sorghum, green grams, and groundnuts) to traders from within and outside the district who resale to other individuals, and community members within the localities. Some bulking groups also buy from other places to sale to locals on retail as food during times of scarcity. Where they exist, the bulking centers have reduced the distance community members have to travel and number of markets they had to visit to find food to buy. Many buyers who approach the groups for the produce increase options groups can sell to. Prior to RWANU farmers sold their produce individually to middle men at farm gate or to other farmers during the periodic markets. RWANU's support to the bulking centers with information boards, weighing scales have catalyzed selling of grain using standardized measurements and sharing of market information. Market information displayed on the whiteboards at the bulking centers facilitates farmer access to information and hence making of informed decisions with regards to when to sale.

Honey producers now have a reliable market for honey and propolis. They can sell to a national buyer- Golden Bees Ltd, local buyers that have emerged in sub-county trading centers (e.g Karita, and Iriiri), as well as buyers from Kenya. RWANU linked honey producers and Golden Bees which offered to buy honey at premium prices and also train the farmers on apiary management and processing. Entry of Golden Bees in the honey value chain in Karamoja, increased competition, catalyzed buying of honey with standard measurements, and increased prices bee keepers receive for their honey.

ASCAs have started forming umbrella organizations such as Kopopwa SACCO which position them able to take advantage of bigger loan products. Access to credit has built the capacity of beneficiaries to be active market players through engagement in micro-enterprises that enable them to build the requisite assets to withstand future shocks. Financial service providers (Centenary bank has a group loan product, and Micro-finance support centre has loan products for VSLAs/ASCAs and SACCOs) have products which RWANU beneficiary groups could take advantage of. A host of service providers involved in capacity strengthening of ASCAs exist in the area which provides a basis for continued ASCA access to capacity building services.

8.3.IMPACT ON HOUSEHOLD FOOD ACCESS AND NUTRITION

8.3.1. IMPACT ON HOUSEHOLD FOOD AVAILABILITY

RWANU market interventions have contributed to increased food availability in the beneficiary households. This has been triggered through the following ways:

- Increased production levels for certain crops relative to before the program as a result expansion of acreage, adoption of field management practices. Text box below presents some examples. *See sections 5.2.5, 5.2.6, and 6.2.6 for details and other examples on this.*

Increased amount of food produced helping to change diet. We were eating only one type of food that's maize, but now we buy rice, get cabbage, maize, millet from our garden and eat with beans. We also get milk from the goats which was not there before (*Celina Chepchock, Compas Karita Amudat*).

Feeding is now far better compared to before RWANU. I kept aside 20 bags of maize for home use, these can even remain and I sale after getting to the next harvest. Before RWANU I would get 10 bags in total and you could not sale any as you had to be cautious with the little food(*Teddy Akol Lokana FG, Namalu*).

Farmers had even abandoned maize but now there is a lot of maize production in Namalu. They were mainly growing local seeds but adoption of improved seeds has led to increased production. Generally yields have increased may be by 50% notably in 2015, you know last year was terrible but they still got something. This improves food availability (*Agro-input dealer Namalu Nakapiripiriti*).

- Increase in diversity of crops grown. Farmers have increased the number of crops grown. They have taken on deliberate vegetable production compared to before when they relied on gathering volunteer plants from the wild which was only possible during the wet season. Staggered planting and watering of the vegetables has spread availability over several month even during the dry spells in case of some households. ***See textbox below for some examples, other examples from the field are provided in section 5.2.4.***

There are food stuff such as cabbage, onions, tomatoes, eggplants which have been introduced from Bugishu region, so we can access it and diversify the diet (**Kanakomol youth group, Nadugut Moroto**).

I grow vegetables (cowpeas, amarathus, Akeyo, onions and tomatoes) in the keyhole garden other main. I do not plant them at the same time such that I can stagger the harvesting. This has enhanced availability of vegetables which I eat at least 4 days in the week (*Akol Ann, Naitakosuan Lotome, Nakap*)

- Improvement in incomes (diversified sources) and access to credit helping to buttress farmers against distress selling of food; smoothen consumption and enhance ability to buy food stuffs that would not often be on the menu (cooking oil, blended flour for children, meat, silverfish, and at times chicken).

When there were food shortages, women used to follow their husbands to the market to demand that they buy food, but today they do not have to do that, since they have money from their business they contribute to household food needs (FGD with men from Chomwogh, Karita, Amudat)

Children would ask for meat but you would not be able to provide, if we ate meat it would be may be once a month. Now we can buy meat or chicken any time we want as I have the money from produce sale and increased brewing (*Teddy Akol Lokana FG, Namalu, Nakapiripiriti*).

The income generating activities have helped in food availability and diet improvement. Those who plant crops according to RWANU have surplus food which the sometimes stock or sell (DCO Nakapiripiriti)

Qualitative findings point to increase in number of meals eaten and type of foods eaten (maize, bean, sorghum, cow peas, amarathus, sliver fish, cabbage, sukuma wiki, tomatoes. Less frequently consumed foodstuffs include meat, chicken, cassava, millet porridge. Unlike before when household members would depend on residues of local brew (locally known as Ngadakai), or feeding on largely sorghum in different forms. Food stuffs eaten have increased compared to the baseline situation when the most common types of food that individuals and families consumed were posho, beans or peas, maize, and wild greens. Wild greens individuals forage during the rainy season were the primary source of vegetable fiber at baseline but qualitative findings suggest that this has changed in most of the beneficiary households.

We were eating only one type of food that's maize, but now we buy rice, get cabbage, maize, millet from our garden and eat with beans. We also get milk from the goats which was not there before (*Celina Chepchock, Compas Karita Amudat*).

Used to eat once a day but after RWANU eat 3 times a day. We are now able to diversify food stuffs eaten. We eat rice, beans, posh, vegetables. Before RWANU we used to eat only posh and milk (*FGD with men from Chomwogh, Karita, Amudat*) Now days we eat 3 meals a day on most of the days. The quality of food has changed and we can afford other ingredients like Royco (*Chomwogh Women FGD*).

Number of meals increased-before intervention we used to eat once and children would eat the burnt layer for breakfast. Now days we eat three times (porridge in the morning, lunch and dinner). We also balance foods eg vegetables, meat, rice beans, superjet (Macron) and chicken once in a while. We can even add nutrients to porridge such as milk and egg. Before RWANU we would add salt to porridge as sugar. There are also other food stuff such as cabbage, onions, tomatoes, eggplants which have been introduced from Bugishu region, so we can access it and diversify the diet (**Kanakomol youth group, Naduget Moroto**).

RWANU has increased the variety of food we eat. Previously we would eat only posho, soghurm, beans and wild vegetables. Now days we also eat Irish, sweet potatoes, cassava, bananas, green vegetables, porridge, silver fish. New methods of how to make porridge (Sliver fish, amarathus, milk eggs and pumpkins as food for children who have just stopped breast feeding (*Lokana FG, Namalu Nakapiripiriti*))

There has been change in the variety and quantity of food people eat. Normally take porridge in the morning, posho and beans for lunch and green vegetables for supper. As pregnant women, now days can eat the right food, including sliver fish, fruits, green vegetables. Sorghum bread, chicken and some bananas (Toto ASCA).

RWANU households never miss a meal, they are doing better than others. They are able to send their children to school as they eat at home (*Views from a District Commercial Officer*).

It is very likely that improved access and availability of food will continue and sustain beyond the life of the project. This assessment is based on observed behavioral changes and mindset change. The triggers for sustained access and availability of food include: increased appreciation of crop production as a livelihood strategy; adoption of better and suitable varieties to the region, adoption of good agronomic practices; increased appreciation and adoption of livestock health management practices; shift towards increased cooperation between couples in production of food crops.

RWANU interventions mainly impacted on the income generation and production for consumption nutrition/food security pathways. The income generation pathway was largely impacted on through:

- Diversified sources of income which strengthened households ability to buy food (honey production, grant enterprises, business as a result of ASCAs, or proceeds from produce sales)
- ASCAs provided loans used to buy food but also investing in income generating activities with proceeds used to buy food,
- Increased volume due to commercial orientation and farming as a business. Adoption of improved seeds, and agronomic practices and expansion of acreage increased the marketable surpluses and hence incomes to buy food
- Bulking contributing to increased earnings and hence better ability to buy food.

The production to consumption pathways was mainly impacted on through

- Deliberate vegetable production through keyhole gardens which helped to improve diversity of foodstuffs eaten
- Adoption of better varieties and associated agronomic practices that triggered increased productivity albeit from very low levels. This enabled households to have food reserves that last for several month in some instances up to next harvest, or planting time hence ability to get food even during the lean period. Having own food at beginning of the planting time allows the household to concentrate on their own gardens to plant crops for future use as opposed to migrating or engaging in casual labour all of which would cause labour shortages and not growing own food.
- Stocking of goats received by members of the WLGs coupled with adoption of better livestock health management practices. This has provided milk for home consumption which was not available before.

Gender -specific impacts and barriers include

- Women led enterprise (own goats, beehives, vegetable production through keyhole gardens, petty business through access to credit or investment of proceeds from crop produce, shared profits from the grants). This has enhanced their participation in income generating activities, income allocation and decision making with regards to these activities. Its noted that women has always been responsible for providing food in the homes, but there was a mismatch between having responsibility and power to make the decisions work. The shift in getting the men to help and be more useful in supporting household food production is helping improve the power relations in the households.

However men still maintain influence on the money earned by women, though its women who decide how much they give them to drink, the women cannot refuse to give when the man asks.

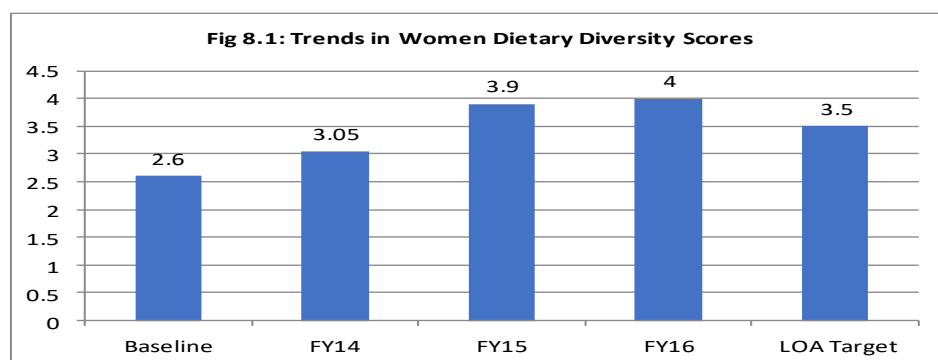
- Mobility of women limiting access to some information, Care responsibilities and burden still on the women. The increase incomes earned has an inherent risk of women taking on more responsibilities performed in the households paying schools, buying food, clothes for children.

Small sizes of land under production, limited ability to select and recycle seeds, limited adoption of soil water conservation practices in the face of water logging, and alcoholism which interfere with production activities are factors that need to be addressed to further strengthen resilience. The following are identified as actions which would further strengthen resilience and household access and availability of food.

- Encourage continued use of improved varieties suitable to the area and the agronomic practices as well as further expansion of acreage.
- Strengthen capacity on selective seed selection for open pollinated varieties, number of recommended recycling of seed, and
- Encourage adoption of soil water conservation practices which will minimize water logging in the fields during the rainy season. Continue to promote good agricultural practices through training for more farmers.
- Promote behavior change messages to address alcoholism and sensitize community members on sale of crop produce at the expense of food in the homes.

8.3.2. IMPACT ON HOUSEHOLD NUTRITION FOR PLW AND CHILDREN UNDER 5 YEARS

Impact on nutrition for PLW: Findings from project annual reports indicate that there has been an increase in the mean number of food groups consumed by women of reproductive age (WDDS) from 2.6 at baseline to 4.0 in FY 16. The mean number of foods groups consumed by women of reproductive age in each of the last three years is higher than that at baseline while the figures for FY15, and FY16 surpass the program target of 3.5 (Figure 8.1). This was attributed to increase in the beneficiary's knowledge on choices of food categories appropriate for their diet through SO2 interventions, and interventions under crop and livestock inputs and services development which strengthen farmer capacity for food production. Findings from FGDs and in-depth interviews with farmers suggest increased diversity of foods eaten by farmers either through own production or buying from the market using income from various activities they are engaged in now.



Source: Computed by authors using data from program annual reports and IPTT

Before RWANU children from the age of 2 years would be feed on porridge, milk, beans soup, water, juice , waragi. This would affect children badly and they would fall sick frequently, had big stomachs. After

RWANU. You breast feed without giving any food for the first 6 months, after that you start giving some soup, porridge, milk water. Milk, eggs, potatoes, pawpaw, soup and egg greens is a popular formula (ToTo ASCA)

Milk from the goats is used for tea for children and I make ghee which we use for cooking. Before RWANU, there was no milk to give to children. Millet which we produce now is also used for porridge for the children (Celina Chepchock, Compas, Karita, Amudat).

Before RWANU it was not possible to give children blended millet porridge as I could not afford it then. Now eat chicken, meat, cow peas, millet porridge, beans and maize in plenty. Also use cooking oil and sugar (Teddy Akol Lokana FG, Namalu, Nakapiripiriti)

The animals have helped to improve nutrition in the households. Milk which women give to children and the family. Make ghee which they put in porridge for children, beans and sorghum bread which has helped to improve the diet (CAHW and husband to beneficiary of WLG, Kukipurat, Lorengechora Napak)

'You may not realize what my life was before I joined this RWANU programme. Things were tough. My family was literally living on sorghum and milk for our daily meal. Some days we would substitute this with porridge and sorghum bread. So the level of nutrition was really poor. When I got some money out of the group, the first thing I did was buy meat and some sugar to improve diet in the family. Ever since then, I have been having some little money to spare for essentials like cooking oil, salt and other ingredients. To me this is a big benefit' (Apule Anna, Namalera, Moruita sub county).

RWANU interventions have brought about increased production hence people have food. Families are also getting milk which they feed to young children. Previously farmers would not get milk from goats. For instance there is a young man near my farm, he may be dirty but all his children are very healthy, they do not need supplementary feeding from the health facility (Local Leader Lorengechora Napak)

Impact on nutrition for children under five years of age: Weight-for-age is a composite index of weight-for-height and height-for-age and thus does not distinguish between acute malnutrition (wasting) and chronic malnutrition (stunting). Children can be underweight for their age because they are stunted, wasted, or both. Weight-for-age is an overall indicator of a population's nutritional health. There has been a 19% reduction in the proportion of children under 5 who are moderately-severely underweight from 21% at baseline to 17% at the time of this study in May 2017. The findings from the study sample are well below the figures reported for the Karamoja sub-region, in the Uganda Demographic and Health Survey 2016 that stand at 26% (UBOS and ICF 2017²⁸) and the Food Security and Nutrition Assessment for Karamoja (FSNA December 2016) which reported prevalence of underweight children to be 20.4%.

Qualitative finds from this study suggest that there is increased diversity of foods eaten in the households; children are now getting adequate meals; and in some instances there is fortification of children's diet (making porridge enriched with vegetables, honey, cooking oil or buying blended flour for porridge). Findings from the quantitative and qualitative analyses point to improved nutrition for PLW and children under five years. RWANU has contributed to the improvement as the anecdotal views from beneficiaries reveal.

Integration of S02 activities with the market development interventions

²⁸ Uganda Bureau of Statistics (UBOS) and ICF. 2017. *Uganda Demographic and Health Survey 2016: Key Indicators Report*. Kampala, Uganda: UBOS, and Rockville, Maryland, USA: UBOS and ICF.

The multi-pronged approach has been key to the changes in malnutrition. The market system interventions catalyzed increased food production and improved farmer ability to purchase food. SO1 interventions imparted knowledge to households and empowered them to use it through interventions that diversified income sources, and increased production. On the other hand SO2 interventions impacted on food utilization, care notably through adoption of good child feeding practices, as well as WASH practices. SO2 interventions had a module on linking agriculture to nutrition, and also promoted vegetable production through the keyhole gardens. Both SO2 and SO1 promoted production of vegetables with proven ability to survive in the area. SO1 promoted access to seeds and crop protection chemicals as well as drip irrigation of vegetables through horticulture production. SO2 also trained farmers on food preparation. SO1 supporting distribution of goats to women and establishment of WLG was geared at targeting inputs that can support the first 1000 days of life.

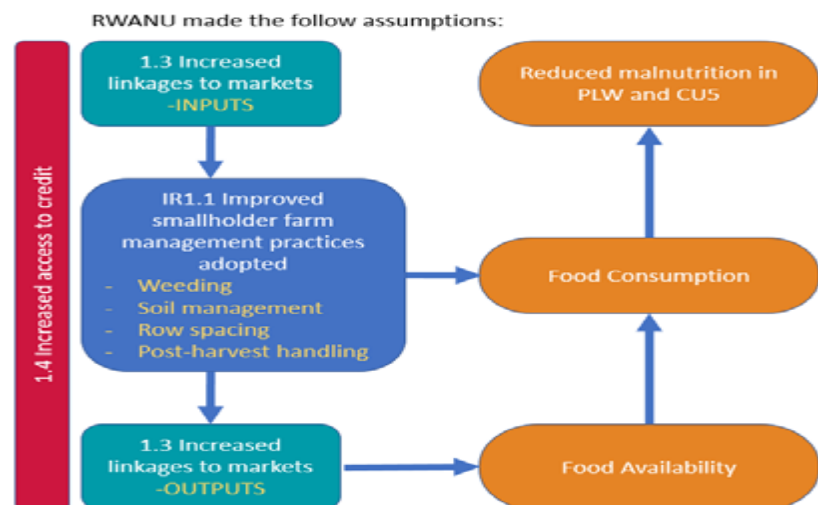
- Training in agronomic practices for production of vegetables and input supply of vegetable seeds. The mother care groups scaled up vegetable production which has positive contributed to food availability and nutrition in the beneficiary households
- Livestock stocking of goats and health management supported access to milk for use in the households.
- Keyhole gardens have improved availability of vegetables. Adoption of practices like double digging. Households that had many gardens could get some to sell as well.

9. CONCLUSIONS AND RECOMMANDATIONS

9.1. CONCLUSIONS

RWANU has strengthened household resilience and positively impact on household food access and nutrition.

RWANU's theory of change for improving food security depicted in the adjacent diagram indicates how three major intermediate results contribute to increased food availability and consumption as well as malnutrition in pregnant and lactating women and children under five. Findings suggest that ***RWANU's theory of change has held. "The improvement in household and market system resilience has resulted in reduced malnutrition in Karamoja"***



- Diversification of income sources and increased food production albeit from very low levels has contributed to improved household access to food and nutrition. This is true for beneficiary households that have adopted improved production practices and engaged in several income generating activities. The number of interventions a household has interfaced with appears to increase odds of improving resilience.
- Intervention like block farms for those cases where members realized a good crop in spite of bad weather, ensure access to food and increased incomes. The ASCAs have greatly contributed to household resilience where they worked. These facilitated consumption smoothening, enable

households to hold on to produce or livestock-minimize distress sales, protect and build assets, spur investment in crop production and other business.

- Scale of investment and nature of enterprise engaged in greatly influence income levels realized. Although there is some improvement the levels are still low. This is true for honey producers, horticulture producers, farmers, and the income generating activities supported with ASCA loans.

Gender differentiated impacts

- Women acknowledged increased participation in household decision making across market intervention areas. This was confirmed by men in the focus group discussions and in-depth interviews as well key informant interviews with district local government officials. Interventions like ASCAs, grants, honey production, bulking, horticulture production, block farming have spurred increased women participation in decision making and income generation.
- Strengthening of women's economic status. Strengthening economic empowerment of women has been achieved through access to credit provided by ASCAs hence investing or scaling up their investment in non-farm income generating activities, income from sell of produce (vegetables and maize), grants (business skills and transfer of these skills to other activities) and engagement in honey production. RWANU has spurred increased women participation in income generating activities. Increase in the range of income generating activities women engage. Now they are involved in honey production, goat production, produce trade, livestock trade, second hand clothes, food vending, and selling vegetables in addition to brewing. This has increased women's income and strengthened their self-worth. The income from various activities as well as increased production has made it easier for the women to meet their traditional role of providing food in the home. Before RWANU women mainly relied on charcoal burning, selling firewood, casual labour and brewing to earn income to provide food and other needs in their homes. Now they spend less time finding and selling firewood or cutting trees for burning charcoal, as ASCAs and the other income generating activities address the need for immediate cash to buy food. The time is spent on other productive activities notably tending to their gardens. Women control the income earned from their activities but men still retain influence, when he asks for some money from an activity done by the women, she can hardly refuse to give him something.
- The groups offer households notably women social safety nets which enables them to support one another during the hard times. Strengthening their bonding social capital.
- Access to tillage services has contributed to reduced drudgery during land opening, positively impacting on time available to women for other productive activities.
- Improved gender relations. FGD participants cited move towards increased participation of men in crop production. However the bulk of work is still done by women.

Today both men and women are involved in production unlike before when this was a preserve of women. This is increasingly influencing rises in production levels (Kopukwa Bulking Group Lorengechorwa, Napak *district*).

My husband is now supportive in undertaking the garden work. This has enable timely undertaking of activities and hence more food in the home (Celina Chepchock, *Compas, Karita, Amudat district*)

- RWANU interventions have catalysed women ownership of livestock notably goats and involvement in livestock marketing. Livestock is also used in the Karimojong cultural context as an economic safety net. This has improved their social standing. However they are still considered not have the ability and confidence to negotiate and bargain with buyers on their own, hence have to be accompanied by men.

- Care work limiting mobility of women, their exploitation of social networks and participation in activities like being CAHWs and CBFs. The program trained more men CAHWs, 133 compared to five women and more honey production CBFs who are men (36) compared to four women.

Ways in which interventions overlap in their impact

- Adoption of technologies: access to services and inputs empowers them with knowledge, sources where from they can buy and exposure on performance of the technologies, improves physical availability, block farm aids learn by doing, credit enhances their ability to buy, honey production facilitated adoption of modern bee hives and also management practices. Income from bulking, grant enterprise and honey value chain also supports adoption.
- Enhancing food availability in the homes: credit supporting consumption smoothing and limiting distress sales, access to inputs and services as well block farmers ensure increased production and productivity. Bulking facilitated adoption of better post harvest handling practices, reducing losses and enhancing food access. Income from honey, grant enterprise, increased production enables purchase of other food items notably those which were previously not on the menu.
- Income diversification: Credit and access to services and inputs better positioned to trigger income diversification.
- Involvement of women in decision making, income generation and allocation
- Social and economic networks- All interventions support learning together learning, access to information. ASCA, access to inputs and services- manyata livestock health initiative and WLG groups, block-farms collective purchase of inputs, bulking aiding access to remunerating markets, honey value chain collective marketing, access to harvesting tools and equipment and learning.

Ways in which interventions diverge in their impacts

Time lag between realizing impact on household capacities varies among the various models. While credit is very versatile and can be relied to address immediate family emergencies and longer, effects, the other interventions, ie honey value chain development, grants depending on the enterprise the group invests in, as well as access to crop and livestock inputs and services have a longer gestation period for triggering impacts and changes in peoples and households capacities.

In-terms of prioritizing resources credit has a multiplier effect on all the other interventions. Evidence from the study reveal that access to credit has been an enabler for grain bulking, holding on to the honey and access to higher earning, access to crop and livestock inputs and services like tillage services with households using their loans to pay for the inputs and services; block farm groups used ASCAs funds to buy seed and pay for tillage services.

Sustainability of outcomes

The ASCAs, commercial input supply, CHAWs, CBFs, tillage service providers are resources which will continue to be accessed by the community members. All agro-dealers and CAHWs interviewed in the study noted that they will continue to provide services even after end of RWANU. Likewise the farmer groups (ASCAs, honey producers, bulking groups, and grant groups) indicated that they will continue beyond RWANU. Farmers have acquired knowledge and appreciated use of improved varieties and good agronomic practices. Increased appreciation of crop production and commercial farming as a viable livelihood strategy in Karamoja and added value of good livestock health management provides a good foundation for continued use of acquired skills, crop and livestock inputs and services. Continued use of the knowledge and services provides a strong foundation for continued realization of increased production, food availability and marketable surplus to earn incomes. The Women Livestock Groups manage the groups collectively (same shelter, grazing is done together, and contribute resources for drugs). This is likely to continue as members appreciate the advantages.

Bulking groups have ventured into produce buying which increases returns to members and enable utilization of the bulking stores for most of the year. The higher earnings from own produce and additional income from produce business offer impetus for continued existence of the bulking centers. It is highly likely that farmers will continue to engage in multiple income generating activities and livelihood strategies which diversify and mitigate risks.

9.2. RECOMMENDATIONS

The following suggestions should be explored by future programs so as to further strengthen resilience at household and market system levels.

9.2.1. RECOMMENDATIONS FOR STRENGTHENING HOUSEHOLD RESILIENCE.

- Multi-prolonged approach ensures touching many points, nodes and hence critical for moving the households forward. Future programs should adopt similar approach
- Promote poultry production, (awareness creation on preventive health management for local poultry, breed improvement with suitable breed, management practices). Vital for increasing women ownership of animals, child nutrition through and to eggs and household incomes. Manure for crop production.
- Encourage continued use of improved varieties suitable to the area and the agronomic practices as well as further expansion of acreage.
 - Encourage adoption of soil water conservation practices which will minimize water logging in the fields during the rainy season. Continue to promote good agricultural practices through training for more farmers.
 - Encourage adoption of soil fertility improvement measures to forestall risk of soil mining
 - Strengthen capacity on selective seed selection for open pollinated varieties, number of recommended recycling of seed,
- Facilitate RWANU groups to engage with other established and successful savings groups whose portfolio have grown over time to enable RWANU farmers appreciate benefits of saving more. This can translate into members increasing their share value and realizing more benefits from bigger savings.
- Strengthen farmer capacity in identification of genuine inputs, (e-scratch, and also looking out for the blue labels on the seed packs, seeking for receipts, not destroying the packing material before seed has germinated, performing germination tests).
- Continue to sensitize members of the farmer groups on costs and benefits associated with collective bulking.
- Strengthen capacity to utilize ICTs notably mobile phones for access agricultural related information (climate information to guide timing of farming activities, market information, and solutions to pests and diseases)

9.2.2. RECOMMENDATIONS FOR STRENGTHENING MARKET SYSTEM RESILIENCE

- Closer engagement with financial service providers and other government programs that promote financial inclusion
 - Closer engagement with the financial service provider will facilitate linkages for the ASCAs, to ensure access to sustainable capacity building, access to products notably from Micro-Finance Support Centre and the private sector)
 - Linkages to existing government programs designed to scale out financial inclusion for the rural areas eg Project for Financial Inclusion in Rural Areas (PROFIRA)
- There is need to assess the needs of different savings groups carefully before proposing major changes to their operations. SACCOs for instance need to be supported to learn from the good governance structures in the ASCAs especially on issues of transparency and accountability. On the

other hand, strong ASCAs should not be rushed to join SACCOs as this may instead work to jeopardize group cohesion. Strengthen capacity of groups to lobby for support and services from government programs such as the Youth Livelihoods Support Program, Uganda Women Entrepreneurship Programme (UWEP), and Community Driven Development. These are resident in the community development officers departments.

- Strengthen capacity of groups in developing proposal as well as advocacy action plans. They should also facilitate links with the community development office at the sub-county and district levels.
- Engage in advocacy to spur local government officers support to market systems.
- Support growth of commercial input supply in Karamoja
 - Continue to support promotional activities to create awareness on sources of quality/genuine inputs and advertising for the agro-input dealers through drive-in during market days, and on the local FM stations.
 - Sensitize agro dealers on diversifying income streams.
 - Sensitize agro dealers in the crop sector on the regulatory framework for the inputs they are engaging in.
 - Engage in advocacy for certification of CAHWs.
 - Engage in advocacy for the government programs and other actors to reduce free input distribution and or use the established agro dealers in channeling their inputs to farmers
 - Promote the village agent model for sustainable access to inputs and services. Build capacity of the village agents to provide services to community members. These would enhance access to inputs, facilitate links to output markets, provide a sustainable source of information to groups as well as linking them to suppliers of savings kits after RWANU's exit.
- Support continued existence of the collective marketing groups and bulking centers
 - Sensitize and build capacity of collective marketing group members on use of mobile phones to access market information.
 - Support the bulking centers to develop action plans and establish links with specific buyers, and where possible support them to engage in forward contracting arrangements.
 - Strengthening bulking groups capacity for market intelligence. Seek market information on prices, production trends and be able to use it to determine when they should sell. Produce prices rise and fall hence the groups should be able to judge at what point prices are likely to fall. The groups should be able to establish break even prices, and make informed decisions as to how long they should hold on to the produce.
 - Link the bulking groups that are also engaged in produce buying to financial service providers like CERUDEB to access loan products which would enable them to increase quantities handled, and be able to resale to community members.
 - Support groups to put in place measures which limit the monopolisation of bulking and produce buying activities by a few individuals such as the traders who may unfairly trade within the group. Proportional to size sharing of incomes and costs depending on utilization of the bulking center premises and services.

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