Food and Agriculture Organization of the United Nations

Officer of the Prime Minister

ANALYSING RESILIENCE FOR BETTER TARGETING AND ACTION

FAO RESILIENCE ANALYSIS REPORT No. 19

FOOD SECURITY AND RESILIENCE OF REFUGEES AND HOST COMMUNITIES IN SOUTH-WEST

UGANDA

RESILIENCE INDEX MEASUREMENT AND ANALYSIS II ◢ RIMA II

ANALYSING RESILIENCE FOR BETTER TARGETING AND ACTION

FAO RESILIENCE ANALYSIS REPORT No. 19

FOOD SECURITY AND RESILIENCE OF REFUGEES AND HOST COMMUNITIES IN SOUTH-WEST UGANDA

Food and Agriculture Organization of the United Nations
Rome, 2019

Required citation:

FAO. 2019. *Resilience analysis in south-west Uganda*. Rome.

Cover photo: © FAO/ Isaac Kasamani

CONTENTS

FIGURES

TABLES

BOXES

ACKNOWLEDGEMENTS

The Food and Agriculture Organization of the United Nations (FAO) would like to thank the Resilience Measurement Unit of the Office of the Prime Minister of Uganda (OPM) for its leadership and initiative in conducting this Resilience Index Measurement and Analysis (RIMA). The analysis was conducted through the Department of Refugees, in collaboration with FAO's country office in Uganda and the FAO Resilience Team for Eastern Africa, and with the technical support of the Intergovernmental Authority on Development – Resilience Analysis Unit (IGAD/RAU). Its aim is to understand the current state of refugee and host communities' food security, well-being and resilience in south-west Uganda.

Immaculate Atieno, Deborah Duveskog and Oscar Ngesa of the FAO Resilience Team for Eastern Africa, Kathryn Clark, Stanslus Okurut and Paul Opio from FAO Uganda, Marco d'Errico, Rebecca Pietrelli, Stefania Di Giuseppe, Genevieve Theodorakis of FAO's Agricultural Development Economics Division (ESA) and Luca Russo from the Resilience Programme Management Team (SP5) contributed with technical information. Guidance and indications from SP5's senior management and FAO Uganda helped shape the outline of the analysis.

Ellen Pay edited the report.

ACRONYMS

ABS	Access to Basic Services
AC	Adaptive Capacity
AST	Assets
CAPI	Computer-assisted Personal Interviewing
CRRF	Comprehensive Refugee Response Framework
CSA	Climate-Smart Agriculture
CSI	Coping Strategy Index
FAO	Food and Agriculture Organization of the United Nations
FCS	Food Consumption Score
GIS	Geographic Information System
GOU	Government of Uganda
IPC	Integrated Food Security Phase Classification
HDDS	Household Dietary Diversity Score
HH	Household Head
MAAIF	Ministry of Agriculture, Animal Industries and Fisheries
MIMIC	Multiple Indicators Multiple Causes
OPM	Office of the Prime Minister of Uganda
RCI	Resilience Capacity Index
ReHoPE	Refugee and Host Population Empowerment Strategic Framework
RIMA	Resilience Index Measurement and Analysis

RMU	Resilience Measurement Unit
RSM	Resilience Structure Matrix
SSN	Social Safety Nets
STA	Settlement Transformation Agenda
TLU	Tropical Livestock Units
UBOS	Uganda Bureau of Statistics
UNICEF	United Nations Children's Fund
UNHCR	United Nations High Commission for Refugees
USD	United States Dollars
VSLA	Village Savings and Lending Association
WFP	Word Food Programme


© FAO / Ny You

OBJECTIVE OF THE ANALYSIS

According to the United Nations High Commission for Refugees (UNHCR), Uganda – and especially Northern Uganda – has been continuously receiving refugees from South Sudan and from countries west of Uganda (including the Republic of the Congo (Congo) and Burundi, among others) since October 2018 (Uganda, OPM, 2018). The total number of refugees and asylum seekers residing in Uganda currently stands at 1 117 030, the majority of which are from South Sudan (785 104), followed by Congo (284 265) (UNHCR, 2018). As the humanitarian situation in these countries remains volatile, the influx of persons into south-west Uganda is on the increase, for example to the Kyaka II settlement in the Kyegegwa District and the Rwamwanja settlement in the Kamwenge District. The settlements of Kyaka II, Kyangwali (Kikuube District) and Nakivale (Isingiro District) were selected to receive the influx of refugees resulting from a deterioration of the security situation in eastern Congo during elections in January 2019.

The overall coordination of the refugee protection and response system in Uganda is led by the Office of the Prime Minister (OPM), while operational response actions are coordinated by the OPM and UNHCR, herein supported by UN agencies, partners and donors. Uganda's door is open to all asylum seekers, irrespectively of their nationality or ethnic affiliation. The country's refugee policy instruments, the Refugees Act (Uganda, 2006) and the Refugees Regulations (Uganda, 2010), are highly progressive and unique in that they grant refugees wide-ranging rights. For example, refugees are free to move and seek employment. Each refugee household is given a plot of land for "purposes of cultivation or pasturing" with a view to strengthening the food, nutrition and income security and self-reliance of refugees (Uganda, 2010). The refugee policy framework further foresees measures to promote the early recovery of refugees and of host populations affected by an influx of refugees, create a foundation for self-sufficiency and lay the basis for future development interventions. Uganda's commitment to promoting the resilience and self-reliance of refugees is further encapsulated in Pillar 3 of Uganda's Comprehensive Refugee Response Framework (CRRF) ("resilience and self-reliance"), which the Government of Uganda (GOU) enacts under the Settlement Transformation Agenda (STA) and through the humanitarian and

development programmes of the multi-stakeholder Refugee and Host Population Empowerment Strategic Framework (ReHoPE).[1] A first assessment of refugee and host community households was conducted in Northern Uganda in November and December 2017 (FAO, 2018). The Resilience Measurement Unit (RMU) under the OPM (which includes staff from the OPM, the UBOS, and from partners FAO, WFP and UNICEF) conducted a follow-up assessment of the food security, well-being and resilience of refugee and host community households in the Kamwenge and Kyegegwa Districts in south-west Uganda in March 2018.

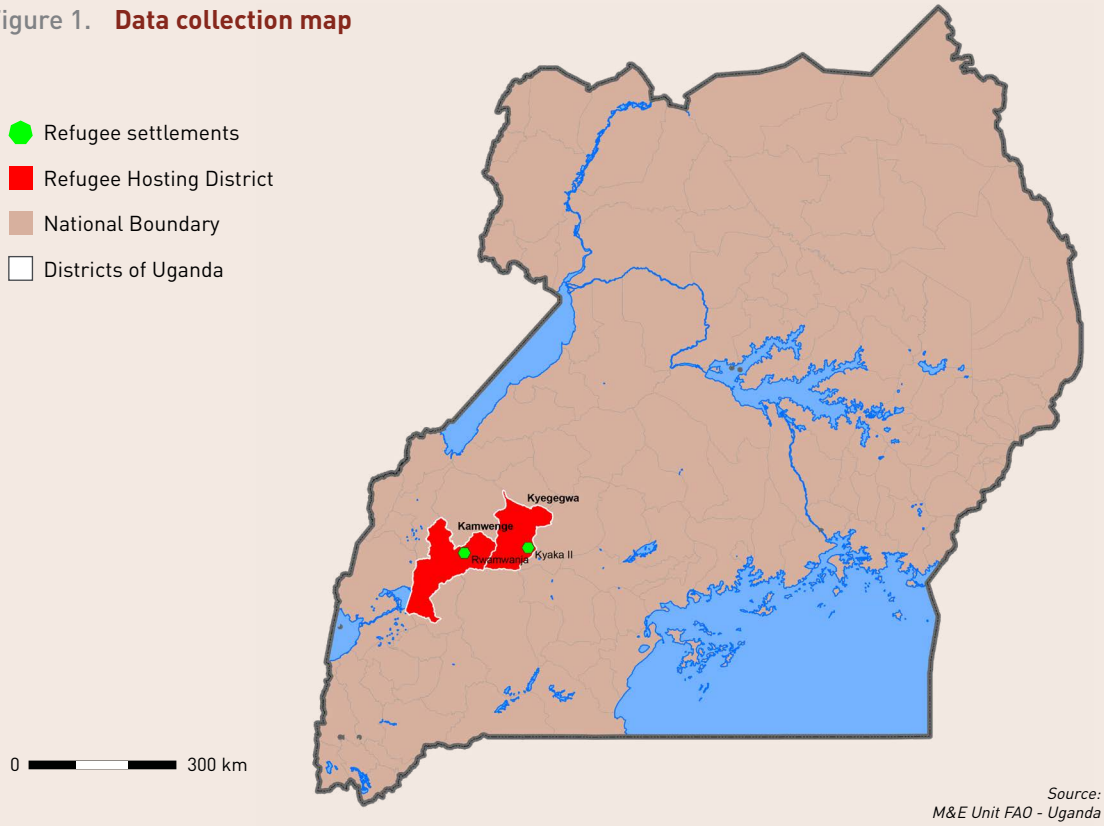
The analysis aims to shed light on the current socio-economic and gender situation of refugee and host communities in south-west Uganda, to help identify key programme needs for the target areas and provide contextual evidence for programme strategy development.

The report provides data on food security and resilience among refugee and host populations.

The analysis of the drivers of resilience requires an understanding of the relative value of the assets provided to support refugees, as well as of the impact of refugees' presence on livelihoods in host communities; it necessitates the mapping of land tenure governance, household decision-making and the access to and control of resources, as well as the examination of the socio-economic strategies and networks on which households rely.

[1] Launched in February 2017, ReHoPE reflects the priorities of the GOU, the UN and the World Bank to enhance resilience and self-reliance among refugees and host communities. All agencies are called upon to contribute in a coordinated and complementary manner to support refugees and host communities. For more information, see United Nations and World Bank, 2017.

Figure 1. **Data collection map**



Source: M&E Unit FAO - Uganda

1 KEY MESSAGES

This section summarizes the main results of the analysis and related implications for policy development and programming

Low resilience among refugee households is linked to limited access to physical productive assets. Refugee households own less agricultural assets (land and livestock) and produce a smaller range of different crops; this results in high levels of food insecurity, the adoption of negative coping strategies to deal with food shortages, and a persistent and high dependency on humanitarian assistance to meet basic needs. Substantial transfers, both in cash and in kind, do not compensate for the lack of inputs and limited production.

POLICY RECOMMENDATIONS

- *Progressively and intentionally guiding refugees from relying on humanitarian assistance to self-reliance is key to building resilience. Humanitarian assistance efforts should prioritize the rebuilding of access to productive assets (including agricultural inputs and land); these efforts should complement social cohesion and protection interventions to ensure the inclusivity of access to assets and integrate refugees both economically and socially.*
- *Refugees should be included in the medium- to long-term strategies of social and economic district development plans.*
- *Inclusive and innovative formal transfer schemes should be set up to stimulate the development of markets by injecting cash into a system; they should be accompanied by training programmes to strengthen agricultural and business skills.*

The main sources of income of refugees are similar to those of host communities, and include crop production, labour and enterprise. In view of these similarities, key strategies to improve the resilience of both refugee and host community households include the diversification of crop types and the creation of alternative sources of income. Implications for policymaking and programming

POLICY RECOMMENDATIONS

- *Creating an enabling environment for job creation and access to jobs for refugees and host community members is key to enhance their income source generation. Among the key constraints in this respect are the limited size of the workforce, the lack of technical know-how, weak market linkages, and barriers to market access (lack of information, for example).*
- *The initial re-establishment of livelihood strategies should be followed by the further development of livelihoods, especially among crop farmers with a low RCI.*
- *Vocational training programmes should be developed with an eye to opportunities along the agricultural value chain, from primary production to processing. There is a need for skilled workers to operate and maintain production infrastructure (e.g. machinery), with a view to upscaling production processes.*
- *Policymakers should create an environment that enables households to exploit off-farm income generating opportunities. Private and public-sector stakeholders should collaborate to promote the social and economic integration of refugees and help leverage the economic potential created by the presence of refugees to support wider rural development.*

Households that sell surplus crops have a higher resilience than households that produce exclusively for their own consumption, in both refugee and host communities. The majority of both refugee and host community households (53 percent) produce crops for their own consumption only; their average RCI is 5 percent lower than that of households that sell surplus crops. In both refugee and host communities, households that consume their entire crop production possess less agricultural assets (including land) than those that sell surplus production.

POLICY RECOMMENDATIONS

- *Farmers' access to markets must be improved to allow them to sell surplus crop production, thereby boosting their income.*
- *It is important to enhance farmers' capacities to graduate from subsistence farming to commercial crop production through the promotion of good agricultural practices and agri-business initiatives. Technical assistance should provide farmers with the knowledge and skills necessary to increase the productivity of the land currently under cultivation, to enable them to sell surplus crops.*
- *Crop and livestock producers (and especially those that consume their entire production within the household) should be helped to build productive assets, to boost their capacity to sell products and increase food availability at the household level.*

The adoption of new livelihood strategies is a long-term process. Upon arrival, most refugees prefer to derive their livelihood from the same activities as in their country of origin; only months after their establishment in a refugee settlement are they ready to change their primary livelihood sources. Female refugees, who are generally better educated than male refugees, are more willing to be integrated in the productive sector of the destination country.

POLICY RECOMMENDATIONS

- *Refugees possess knowledge and skills gained through the livelihood strategies in which they engaged in their countries of origin. Initial assistance should help refugees rebuild their livelihoods based on this existing know-how upon settlement. This assistance should focus on refugee households' access to information and productive assets, to enable them to adapt to new environmental factors (e.g. by adopting agricultural techniques suited to the ecological zone in terms of soil quality, rainfall patterns, etc.). Where possible, refugees should be encouraged to become entrepreneurs to gain their livelihoods.*
- *Specific actions should be aimed at youths and women, who are more willing than adult males to integrate into the local labour force in the early stages. Targeted programmes should aim to develop business skills and technical capacities that allow them to participate in the development of value chains (especially through value addition).*

The shocks that affect the resilience of both refugee and host community households most are droughts, water shortages, and crop pests and diseases. The illness of household members (including income earners) affects the resilience of both refugee and host community households.

POLICY RECOMMENDATIONS

- *There is need to raise the awareness of refugee and host communities as to the realities of climate change and its associated risks, and strengthen their capacity to mitigate the impact of climatic and environmental shocks. The accessibility and use of climate information should be improved.*
- *Climate-smart agriculture (CSA) is key to the reduction of households' vulnerability to climatic shocks affecting their long-term resilience.*
- *Investments and support measures should promote the sustainable, community-led management of natural resources and environmental protection – linked to water catchment plans – among both refugee and host communities.*
- *The livelihood skills of refugee and host communities must be bolstered to ensure the continuity of income in cases where a household's main income earner falls ill.*
- *Synergies with existing adaptation projects (and especially related to the accessibility and use of climate information) in the same or neighbouring geographical zones must be promoted to enhance communities' capacities to mitigate the effects of erratic weather.*

Access to social networks and credit facilities is a critical determinant of livelihood resilience. Only 25 percent of refugee households, and 38 percent of host community households, report having access to credit. Social and credit networks include village savings and lending associations (VSLA) and women and youth groups.

POLICY RECOMMENDATIONS

- *The access to credit facilities of both refugee and host community households must be improved to strengthen livelihoods.*
- *The creation of social networks working to improve livelihood skills, such as livestock and business associations, should be encouraged. Such networks promote discovery-based learning and the exchange of information, knowledge and experience among peers.*
- *The effect of prevailing traditions and social norms on societal initiatives should be examined periodically, as refugees become more settled in their hosting districts over time. In other words, future societal programmes must duly consider how social cohesion and socio-economic integration affect the access to services and goods through social networks or safety nets, to boost the resilience of the most vulnerable households in a community.*
- *There is a need for social protection interventions that target persons with specific needs from the refugee population and extremely vulnerable individuals from the host community, as well as other marginalized segments of the population. Targeted, technical assistance should aim to strengthen households' livelihoods, and thus their self-reliance and dignity, without stigmatizing households as being unable to support themselves.*

The food security status of households in both refugee and host communities is positively correlated with access to adequate sanitation, health facilities and agricultural production assets that guarantee diversified sources of income and nutrition. Access to adequate sanitation is one of the key determinants of the various dimensions of food security, and especially the food consumption score (FCS) and the household dietary diversity score (HDDS). Adequate access to physical production assets is a further determinant of households' food security status and thus well-being.

POLICY RECOMMENDATIONS

- *Interventions should improve refugees' access to sanitation (by building additional communal latrines and household toilets) and health facilities, to guarantee their food security. Basic services, such as the provision of adequate market infrastructure, must be developed in host communities, in line with national and district development plans.*
- *To ensure that refugee households make the transition from being dependent on food aid to self-reliance, livelihood assistance should help households diversify their crops and their sources of income. Refugee households should start producing agricultural products immediately after arriving, to diversify their food supplies.*
- *Humanitarian and development assistance should be grounded in studies into the drivers of vulnerability and resilience; it should target recipients on the basis of vulnerability rather than time spent as a refugee, to help households graduate from humanitarian assistance to self-reliance.*

2 MAIN FINDINGS AND THEIR IMPLICATIONS FOR POLICYMAKING AND PROGRAMMING

This section provides, for each finding, key evidence from the analysis, and outlines policy and programme implications.

2.1 RESILIENCE

MAIN FINDINGS 1

Low resilience among refugee households is linked to limited access to physical assets.

Refugee households are less resilient than host community households; refugee households have an average RCI of 40, compared with an average RCI of 53 for host community households. Figure 1 provides an overview of RCI scores by household type and district. The low RCI of refugee households is the result of their limited access to agricultural inputs (e.g. land or livestock, measured in tropical livestock units).[2]

Refugee households have high levels of food insecurity, which negatively affects their RCI scores. This high level of food insecurity results from the fact that refugees' access to land is limited and that they have fewer animals and produce fewer types of crops. As such, they remain highly dependent upon humanitarian assistance to meet their basic needs and adopt negative coping strategies to deal with food shortages. Even substantial transfers do not compensate for the lack of inputs and low production levels.

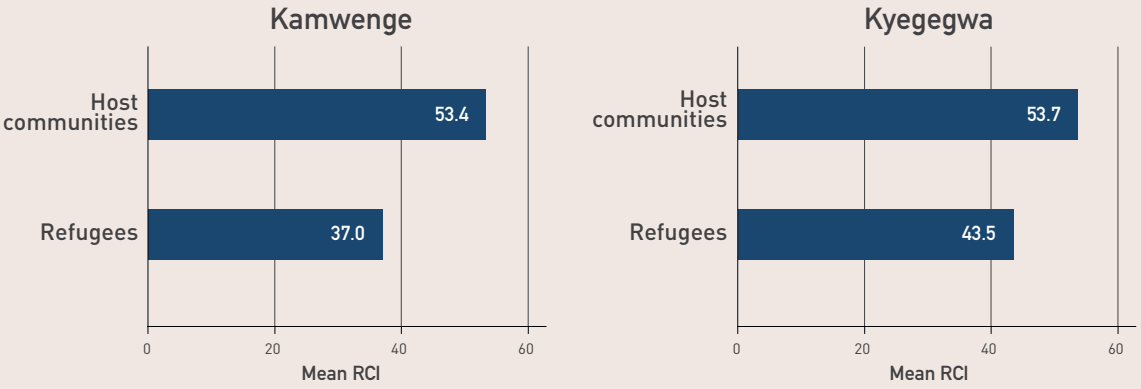
[2] Tropical Livestock Unit (TLU) is a unit of measurement for livestock assets; it enables the aggregation of livestock from various species by converting numbers of animals to their equivalent TLU on the basis of conversion factors, with one TLU corresponding to 250 kg live weight. For more information see FAO, 2011 and Njuki *et al.*, 2011.

74 percent refugee households report crop farming as their primary source of income; access to productive land is therefore of major importance to the sustainability of their livelihoods and the diversification of food sources. Host community households have better access to land: the average size of their farms is 2 038 hectares, compared with the 0.09 hectares assigned to refugee households by the Government (although host communities too are faced with problems related to the access to agricultural assets).

Host households plant twice as many types of crops as refugee households, who grow an average of two to three crop types (see Annex II, Table A5). Crop diversification has been found to be a critical component of climate-smart agriculture; it boosts production, thereby contributing to the building of resilient livelihoods (Makate *et al.*, 2016). Newly settled refugees generally produce only two types of crops, which hampers production. As a result, refugee households are faced with high levels of food insecurity and adopt negative coping strategies in the face of food shortages, as attested by CSI scores of more than 30 (see Annex II, Table A3). Primary coping strategies adopted by refugees include relying on less preferred or less expensive foodstuffs, accepting food in return for labour, consuming seed stocks, limiting the size of portions, purchasing food on credit and, to a lesser extent, selling small assets.

Access to cash transfers to meet food needs does not compensate for refugees' lack of productive assets (e.g. agricultural inputs) or training, as current cash transfer schemes are intended to cover purchases of food only. For cash transfers to boost households' agricultural output and create new sources of income, transfer schemes must consider market opportunities and refugees' capacities to exploit them. In addition, schemes should be linked to district development plans to reap the development potential created by the presence of refugees.

Figure 2. **Mean RCI of refugee and host community households in the Kamwenge and Kyegegwa districts**

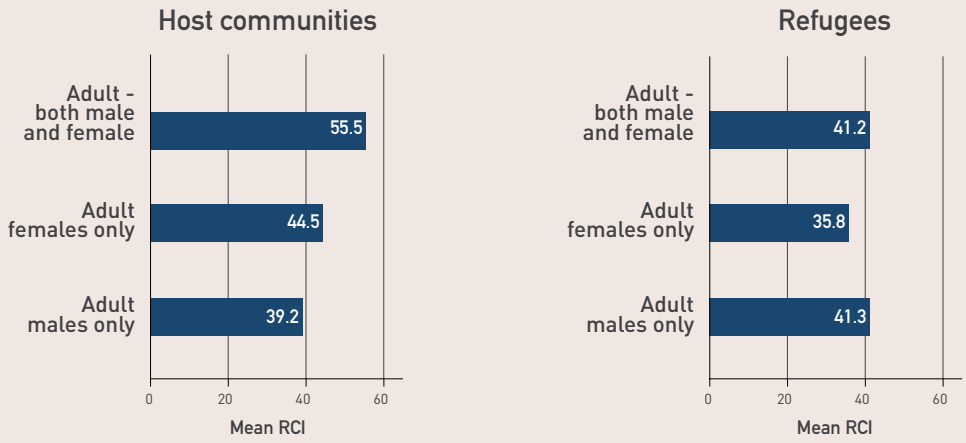


Source:
Authors' own calculation

Host households with male adults only have a lower RCI than those with only female adults, or with both male and female adults. Meanwhile, refugee households with female adults only have the lowest RCI. The average age of refugee households with male adults only is 44; that for refugee households with only female adults is 41. The majority of both refugee and host households are headed by men. Refugee and host households with only female – or only male – adults have less income sources and agricultural assets than those with adults of both sexes.

Refugee households' resilience is low upon arrival in the assessed settlements but increases after 3 to 12 years into their stay (see Table A13); this trend starts to wane as households stay in the settlements for extended periods of time (about 15 years). The direct relationship between the duration of households' settlement and their level of resilience necessitates further investigation. For example, refugees in newer settlements (such as Palabek in the Lamwo District) have been found to be more resilient than refugees in much older settlements (such as Rwamwanja in the Kamwenge District). This suggests that the hypothesis that refugee households build resilience over time may only be valid if households receive effective livelihoods support that purposely aims to build self-reliance.

Figure 3. **Mean RCI of refugee and host communities by household composition**



Source: Authors' own calculation

Implications for policymaking and programming

- Progressively guiding refugees from relying on humanitarian assistance to self-reliance is key to building resilience. To this end, humanitarian assistance efforts should prioritize the following initial livelihoods support measures: rebuilding access to productive assets (including agricultural inputs and land), helping refugees orient themselves in the production and marketing systems of their host environment, and improving the absorptive capacity of local systems (some Ugandan districts have experienced sudden population increases of 13 to 54 percent over the past two to three years, due to the influx of refugees). Efforts towards improving refugees' access to productive assets must be accompanied by social cohesion and protection interventions to ensure the inclusivity of access to assets and integrate refugees both economically and socially.
- To ensure that refugees graduate from relying on humanitarian assistance (for example, food aid) to self-reliance, they should be included in the medium- to long-term strategies of social and economic district development plans.
- Inclusive and innovative formal transfer schemes should be set up to stimulate the development of markets by injecting cash into a system; they should be accompanied by training programmes to strengthen agricultural and business skills. Development programmes aimed at refugees should take due account of the absorptive capacity of local systems, as well as of the availability of productive assets. The mechanisms through which cash-based livelihood support is delivered (usually public services) must be strengthened.
- Evidence-based analysis is needed to gain a clear understanding of the direct relationship between the duration of refugees' settlement and their level of resilience. The building of resilience and self-reliance (as opposed to the dependency on food aid and other assistance) requires deliberate, focused and evidence-based interventions. Interventions must improve opportunities for income generation, with a key focus on access to physical assets (including agricultural inputs), the diversification of income sources, access to credit facilities, the strengthening of social networks and – to some extent – the creation of formal transfer schemes.

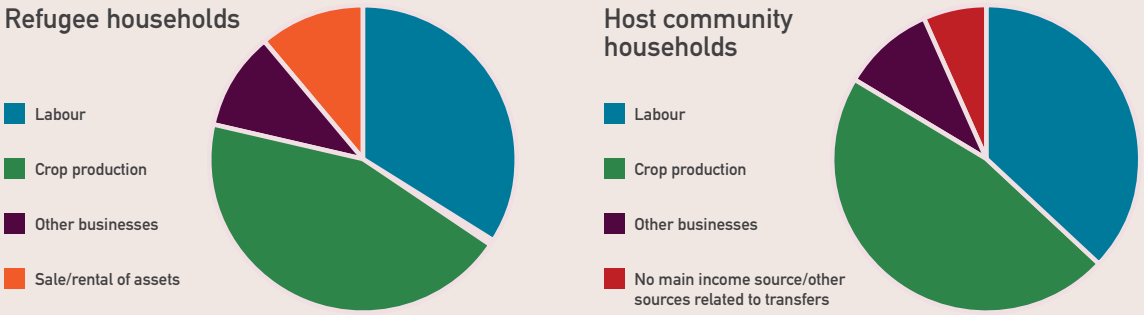
MAIN FINDINGS 2

The main sources of income of refugee households are similar to those of host households with the same RCI; 67 percent of the households included in the survey engage in crop farming, while 29 percent are engaged in agropastoral activities.

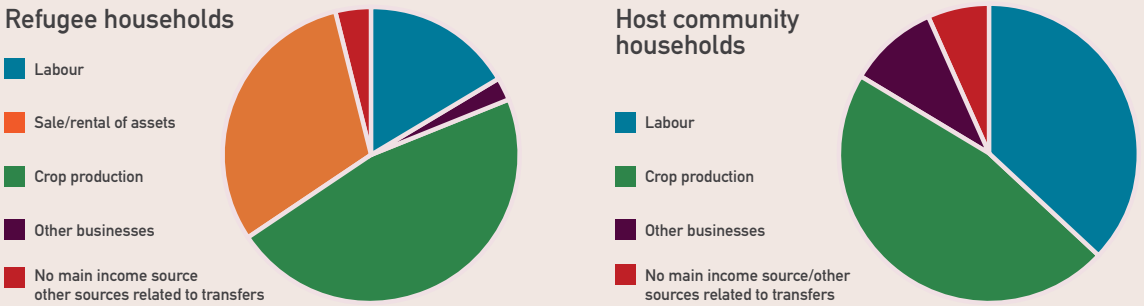
The main sources of income of refugee households are similar to those of host households with a comparable RCI. The diversification of income sources of both refugee and host households is low; two types of income-generating activities dominate, namely crop production and labour (see Annex II, Table A3). Around 74 percent of refugee households are crop farmers, while 22 percent are agropastoralists; meanwhile, 58 percent of host households engage in crop farming as their main source of livelihood, and 37 percent in agropastoral activities. Crop production is the primary income source for both refugee and host households in the lowest and highest RCI terciles, as confirmed by the Reach Initiative/UNHCR report. Interventions to strengthen livelihoods should therefore target groups involved in similar income-generating activities (REACH and UNHCR, 2018).

Figure 4. **Main sources of income of refugee and host community households with a low RCI (a) and a high RCI (b)**

(a) Households with a low RCI: 44 percent of refugee households (172 households) and 20 percent of host households (63 households)



(b) Households with a high RCI: 20 percent of refugee households (79 households) and 50 percent of host households (156 households)



Source:
Authors' own calculation

The most resilient households, in both refugee and host communities, are those that have diversified sources of income, are engaged in crop production, off-farm businesses and the sale of agricultural and non-agricultural products, and have a limited dependency on labour as a source of income.

Host households with vulnerable members (including widows and ill persons) have a lower RCI than those with no vulnerable members. Major determinants of the RCI of host households without vulnerable members include the availability of physical productive assets and the access to livestock markets. Meanwhile, the score of refugee households with a low RCI is unaffected by whether or not they include vulnerable persons (see Annex II, Table A7). Among the factors causing a low level of resilience are the limited availability of household and agricultural productive assets.

Only 27 and 15 percent of refugee and host community households, respectively, report having received training (See Annex III, Table A12). Of these households, 23 percent (refugee households) and 51 percent (host community households) received training on agricultural techniques, while 56 percent (refugee households) and 47 percent (host community households) received training related to business skills.

Implications for policymaking and programming

- Refugees possess knowledge, skills and experience, gained through the livelihood strategies in which they engaged in their countries of origin. Initial technical assistance should aim to build livelihoods based on this existing know-how (the identification of which should be a part of standard registration practices). To enable refugees to re-establish their household livelihood strategy within the first six months after settling, they should be included in information-sharing projects (e.g. on the planting calendar, market dynamics and other relevant aspects). Such early support empowers refugees to meet their basic needs, with less reliance on humanitarian assistance.
- The re-establishment of livelihood strategies for refugees should be followed by the further development of livelihoods. Farmers should be educated and trained to diversify their crops and add value to their output. Crop farmers with a low RCI should be included in programmes to enhance their capacities, especially those related to value addition and technical skills (e.g. production techniques). Agricultural households accounted for nearly 80 percent of poverty reduction in Uganda from 2005 to 2013 (World Bank, 2018). By broadening refugees' understanding of agriculture beyond crop production for household consumption, employment opportunities can be created along agricultural value chains, from the supply of inputs to value addition and marketing. In addition, barriers to the development of value chains (e.g. related to the supply of energy) should be addressed.
- Agriculture potentially plays an important role in poverty reduction. Vocational training programmes should be developed with an eye to opportunities along the value chain, from primary production to processing. There is a need for skilled workers to operate and maintain production infrastructure (e.g. machinery), with a view to upscaling production processes.

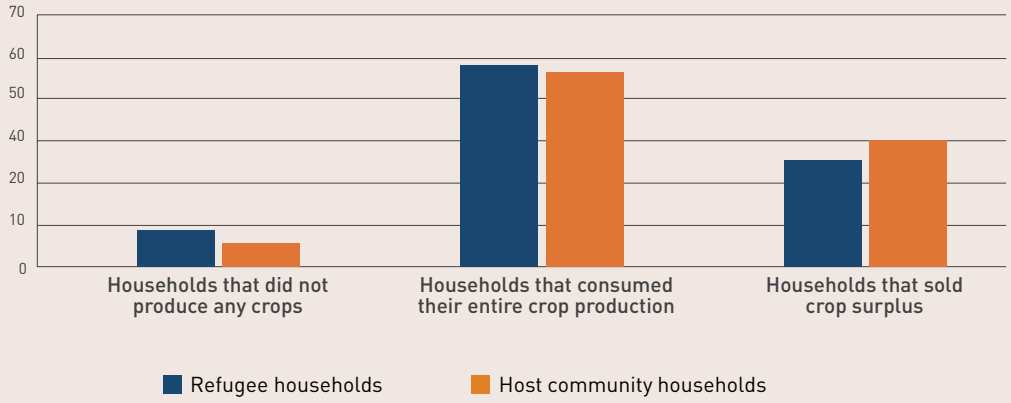
- Programmes to support livestock activities should focus on two primary aspects that are often overlooked in efforts to develop value chains and support livelihoods: traditional, cultural attitudes regarding livestock (notably cattle), and animal health. Indeed, a failure to prioritize animal health may create risks to livelihoods and human health. Epizootic disease control and prevention is a key complementary area of assistance that is, however, not effectively integrated into efforts to assist refugee and host communities.
- Refugee households should be encouraged to exploit off-farm income generating opportunities, such as business activities in selected value chains. Policymakers should create an enabling environment to promote such activities, for example by encouraging households to exploit new market opportunities. Private and public-sector stakeholders should collaborate to promote the social and economic integration of refugees and help leverage the economic potential created by the presence of refugees to support wider rural development.
- An enabling environment for job creation and access to jobs for refugees and host community members must be created. Among the key constraints in this respect are the limited size of the workforce, the lack of technical know-how, weak market linkages, and barriers to market access (lack of information, for example). Development actors should work with district officials working on agricultural production and marketing, among others, and promote the improvement of infrastructure (e.g. roads, water infrastructure for agriculture) and formal financial services. It is important that private and public sector stakeholders work together to support the social and economic integration of refugees and further wider rural development.

MAIN FINDINGS 3

Households that sell surplus agricultural crops have a higher resilience than households that produce exclusively for their own consumption, in both refugee and host communities.

The bulk of crops produced by both refugees and hosts is consumed by the household, rather than sold. Figure 4 provides an overview of the percentages of households that sell crop surpluses and those that consume their entire production, for refugee and host communities. About 30 percent of refugee households and 36 percent of host households not only produce for household consumption but also sell crops in nearby markets. One-tenth of refugee households did not produce crops over the past 12 months, but instead relied on humanitarian assistance. Meanwhile, 6 percent of host households did not produce any crops, relying on the sale of animal products and (cash) transfers.

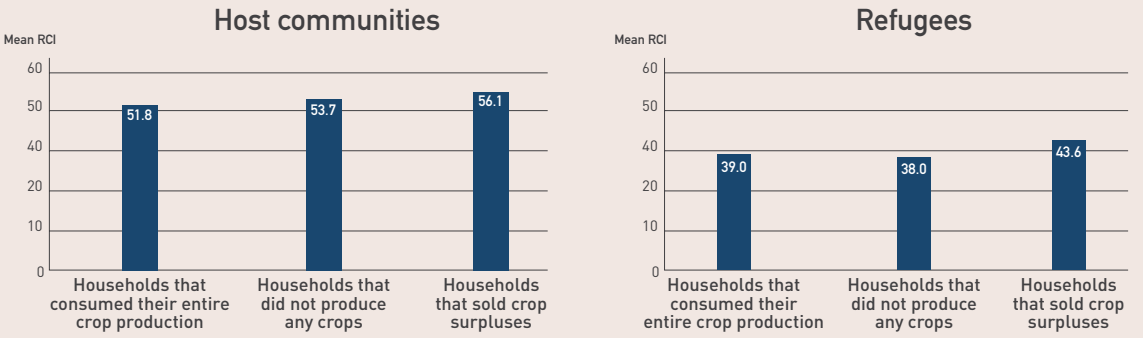
Figure 5. **Sellers and household consumers of agricultural crops, as a percentage of total households**



Source:
Authors' own calculation

Households that sell crop surpluses have a higher RCI than households that consume their entire crop production; this applies to both refugee and host communities (see Figure 5).

Figure 6. **Mean RCI of sellers and household consumers of agricultural crops, for host community and refugee households**



Source:
Authors' own calculation

Important factors contributing to the high RCI of net-selling households include the access to agricultural and petty trade markets and credit facilities, which allow households to purchase the inputs needed to produce crops (see Annex II, Table A6). Although the diversification of crops is low across all categories of households, households that sell crop surpluses have an additional source of income as compared with those that consume all their crops. In both refugee and host communities, households that consume their entire crop production have access to fewer assets, including agricultural assets (e.g. land). This difference is evident even in host communities, where net sellers have more land for crop production than net consumers. Meanwhile, refugee settlements are often located on marginalized land, which makes it even harder for refugees to access productive land. In light of possible future influxes of refugees, the Ugandan Government and UNHCR have reduced the size of plots allocated to refugees for crop production to 30 m x 30 m.

Refugees' access to productive land is expected to become increasingly problematic, heightening the need for assistance related to agricultural inputs to focus on ecological zones and agricultural activities identified and integrated in district development plans by the MAAIF. The 2018 Joint Multi-Sector Needs Assessment confirms this finding, and stresses that land allocated to refugees must be suitable for agricultural production with the appropriate inputs (REACH and UNHCR, 2018).

Implications for policymaking and programming

- Farmers' access to markets must be improved to allow them to sell surplus crop production, thereby boosting their income.
- It is essential to enhance farmers' capacities to graduate from subsistence farming to commercial crop production to diversify their sources of income, for example through the promotion of good agricultural practices and agri-business initiatives. Technical assistance should provide farmers with the knowledge and skills necessary to increase the productivity of the land currently under cultivation, to enable them to sell surplus crops.
- Crop and livestock producers (and especially those that are net buyers of agricultural products) should be helped to build assets, to boost their capacity to sell products and increase food availability at the household level. Efforts towards the development of industries and value chains for animal products should duly consider cultural attitudes towards livestock rearing, as well as aspects related to animal health.

MAIN FINDINGS 4

The adoption of new livelihood strategies is a long-term process.

The adoption of new livelihood strategies is a long-term process. Upon arrival, most refugees prefer to derive their livelihood from the same activities as in their country of origin (see Annex II, Table A10); only months after their establishment in a refugee settlement are they ready to change their primary livelihood sources.

Educated female refugees are more willing than their male counterparts to integrate in the productive system of their host countries. This holds especially true for those who went to secondary school or hold a college or university degree, representing 6 percent of all refugees. More assistance should be given to skilled refugees to exploit market opportunities and become active in viable economic sectors offering long-term employment (Development Pathways, 2018). The sectors refugees are most interested working in include agriculture, business and construction. The majority of those who were not employed in their country of origin prefer to work in the agriculture sector.

Implications for policymaking and programming

- Refugees possess knowledge and skills gained through the livelihood strategies in which they engaged in their countries of origin. Initial assistance should help refugees rebuild their livelihoods based on this existing know-how upon settlement. This assistance should focus on refugee households' access to information and productive assets, to enable them to adapt to new environmental factors (e.g. by adopting agricultural techniques suited to the ecological zone in terms of soil quality, rainfall patterns, etc.). Where possible, refugees should be encouraged to become entrepreneurs to gain their livelihoods.
- Specific actions should be aimed at youths and women, who are more willing than male adults to integrate into the local labour force in the early stages. Such targeted programmes should aim to develop business skills and technical capacities that allow them to participate in the development of value chains (especially through value addition).

MAIN FINDINGS 5

The shocks that affect households most are droughts, water shortages, and crop pests and diseases. The illness of household members affects the resilience of both refugee and host communities.

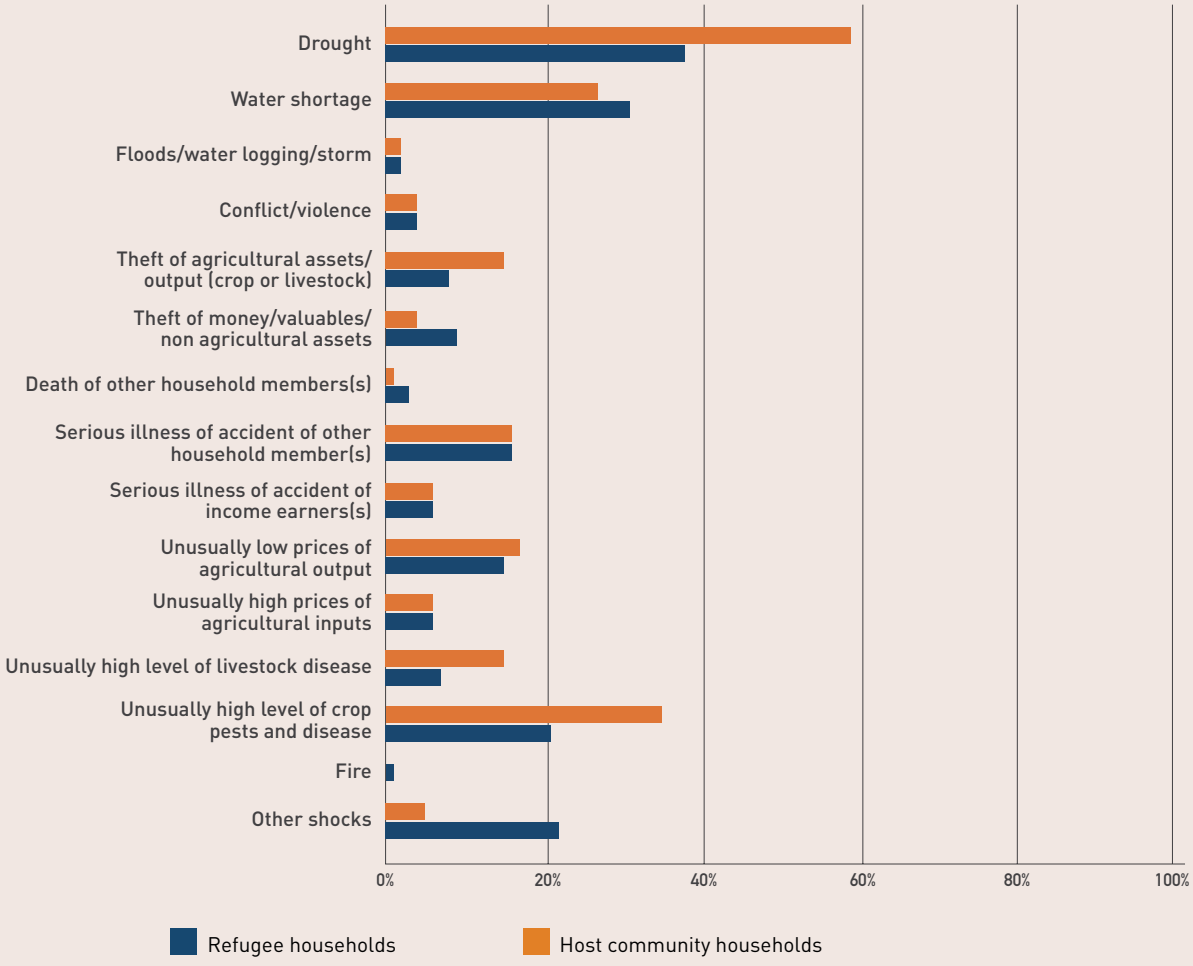
Both refugee and host community households reported that shocks had affected their livelihoods. Figure 6 provides an overview of shocks experienced over the past 12 months as reported by refugee and host community households.

Droughts and water shortages are among the most prominent shocks reported. Droughts affected 38 percent of refugee households, and 59 percent of host households; water shortages were experienced by 31 and 27 percent of refugee and host community households, respectively. Water shortages take various forms, such as the lower average volume of water available per person per day reported by refugees as compared to host community households (REACH and UNHCR, 2018) or shortfalls in water infrastructure (Uganda, 2018). Crop pests and diseases

(including fall armyworm and banana wilt) were reported by both refugee and host community households (NARO, 2018). Livestock diseases affected 15 percent of host households and 7 percent of refugee households.

Among the livestock diseases affecting both refugee and host community households are Rift Valley fever (RVF), foot-and-mouth disease (FMD) and anthrax.[3] Having a household member who is ill, and especially a member who is an income earner, negatively affects both refugee and host community households, but particularly diminishes the resilience of refugee households.

Figure 7. **Overview of shocks reported by refugee and host community households (% of households reporting a type of shock)**



Source:
Authors' own calculation

[3] For information on Rift Valley fever surveillance, see www.fao.org/3/i8475en/I8475EN.pdf. Updates on the prevalence of livestock diseases in Uganda can be found at www.oie.int/wahis_2/public/wahid.php/Reviewreport/Review?page_refer=MapFullEventReport&reportid=29932 (foot-and-mouth disease), www.oie.int/wahis_2/public/wahid.php/Reviewreport/Review?page_refer=MapFullEventReport&reportid=29931 (Rift Valley fever) and www.oie.int/wahis_2/public/wahid.php/Reviewreport/Review?page_refer=MapFullEventReport&reportid=26699 (anthrax).

Implications for policymaking and programming

- Climate-smart agriculture (CSA) is key to the reduction of households' vulnerability to climatic shocks affecting their long-term resilience. CSA foresees the introduction of crop varieties that are resistant to drought and suited to specific ecological zones (defined by the Ministry of Agriculture, Animal Industries and Fisheries (MAAIF) and linked to district development plans).
- The development of selected agricultural livelihoods as promoted by the MAAIF on marginal lands is key to building sustainable and resilient livelihoods and ensuring food and nutrition security.
- Investments and support measures should promote the sustainable, community-led management of natural resources and environmental protection – linked to water catchment plans – among both refugee and host communities. Forest management plans must ensure that wood and non-wood forest products are produced sustainably; this is essential to the promotion of resilient agricultural livelihoods.
- The livelihood skills of refugee and host communities must be bolstered to ensure the continuity of income in cases where a household's main income earner falls ill.
- Synergies with existing adaptation projects (and especially those on the accessibility and use of climate information) in the same or neighbouring geographical zones must be promoted to enhance communities' capacities to mitigate the effects of erratic weather.
- Mechanisms for the surveillance of crop and livestock diseases should be set up to ensure that farmers are warned early and take prompt action. The Government should provide extension services to help farmers take up information and decide on appropriate actions.

MAIN FINDINGS 6

Access to social networks and to credit facilities is a critical determinant of livelihood resilience.

Refugee and host community households rely on social safety nets to meet their basic needs and strengthen their resilience. Access to social and credit networks is an important determinant of resilience; such networks are conducive to consumption smoothing when households suffer shocks.

Table 1 provides an overview of the various types of associations households can engage in, including village savings and loan associations, farmer groups, and women and youth groups.

With the exception of savings associations, the formation of groups that support social cohesion, provide skills training or engage in collective activities (e.g. the production of crops or animal products) remains weak. Examples of such groups include farmer field schools and livestock and business associations in the south-west, which can provide a platform to build skills and capacities related to innovative farming methods – whose importance is illustrated by the fact that the livelihoods of both refugee and host community households depend to a large extent on crop farming and agropastoralism.

While access to credit through social networks or microfinance institutions is an important determinant of the resilience of refugee and host community households (see Annex III, Figure A8), only 25 percent of refugee households, and 38 percent of host community households, report having accessed credit facilities during the 12 months preceding the survey.

Implications for policymaking and programming

- Access to credit facilities for both refugee and host community households must be improved to strengthen livelihoods.
- The creation of social networks working to improve livelihood skills, such as livestock and business associations, should be encouraged. Such networks promote discovery-based learning and the exchange of information, knowledge and experience among peers.
- The effect of prevailing traditions and social norms on societal initiatives should be examined periodically, as refugees become more settled in their hosting districts over time. In other words, future societal programmes must duly consider how social cohesion and socio-economic integration affect the access to services and goods through social networks or safety nets, to boost the resilience of the most vulnerable households in a community.
- There is a need for social protection interventions that target persons with specific needs from the refugee population and extremely vulnerable individuals from the host community, as well as other marginalized segments of the population. Such interventions must promote consumption smoothing, to prevent people from backsliding into poverty.

Table 1. **Participation of refugee and host households in associations (% of total number of households)**

Type of association	Refugees	Hosts
Agricultural cooperative	1.27%	1.94%
Farmer group	8.86%	5.16%
Livestock association	1.01%	0.65%
Village savings and loan association	29.37%	45.16%
Business association	1.52%	1.61%
Women group	4.56%	5.16%
Farmer/pastoral field school	0.00%	0.00%
Youth group	2.53%	1.61%
Community watch group	0.76%	0.32%
Cultural group	1.01%	6.13%
Other networks	5.06%	7.42%

Source: Authors' own calculation

Overall, targeted, technical assistance should aim to strengthen households' livelihoods, and thus their self-reliance and dignity, without stigmatizing households as being unable to support themselves.

2.2 FOOD SECURITY

MAIN FINDINGS 7

The food security status of households in both refugee and host communities is positively correlated with access to adequate sanitation, health facilities and agricultural production assets.

The overall food security scores of refugee households at the time of the survey are reasonable (although they are lower than those of host households). The survey used the food consumption score (FCS), a key food indicator, to evaluate the food security situation of households. An FCS score of less than 21 indicates a "poor diet", a score of 21 to 35 a "borderline diet" and scores of more than 35 an "acceptable diet".[4]

Host community households scored an average FCS of 57, compared with 44 for refugee households. Both refugee and host households consume mostly cereals, pulses, vegetables and tubers; however, the diets of host community households are more diversified and include more proteins. About 35 percent of refugee households primarily consume food received through food assistance. Work under the Comprehensive Refugee Response Framework (CRRF) has shown that the displacement of persons generally leads to a decline in food security. Meanwhile, the Integrated Food Security Phase Classification (IPC) analysis of August 2018 highlighted that the food security situation in refugees' countries of origin, such as Congo, is deteriorating due to the rise in armed conflicts, which trigger refugee flows.[4]

Households that have diversified income sources and cultivate various types of crops have more diversified diets. Refugee households purchase the bulk of their food, while host households produce most of their food themselves (see Figure 7).

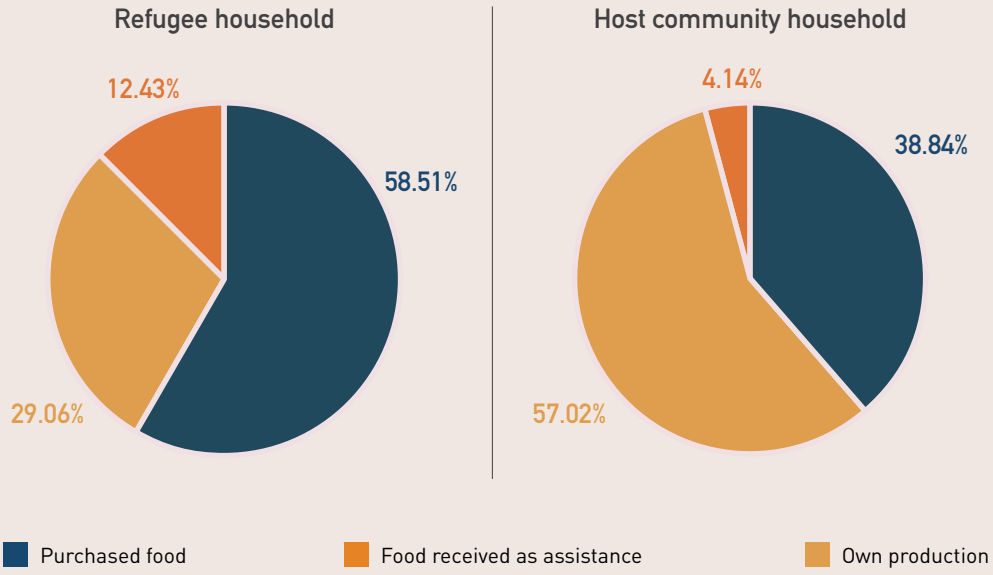
At the time of the survey, 77 percent of refugee households, and 89 percent of host households, are found to consume "acceptable" diets. The FCS for households with adults of one sex only are lower than those of households with both male and female adults. Access to adequate sanitation and closeness to health facilities are key determinants of food security outcomes. In Kyaka II and Rwamwanja, only 47.5 and 45.6 percent of refugee households, respectively, report having access to adequate sanitation (see Table A2). Overall, access to water is reported as adequate and stable – a result of recent efforts by the Ugandan Government (supported by UNICEF and UNHCR) to improve basic social services offered to refugee and host communities in line with the CRRF (UNHCR, 2018).

[4] The Integrated Food Security Phase Classification (IPC) is a set of protocols to classify the severity and causes of food insecurity and provide actionable knowledge by consolidating wide-ranging evidence (see FAO, 2019). IPC (2018) provides a detailed analysis of the food security situation in Congo.

While efforts to improve water and sanitation infrastructure in Northern Uganda (UNHCR, 2018) have been stepped up, similar efforts are still needed to guarantee food security in the settlements of south-west Uganda. Overall, the access to sanitation and water is adequate and stable for host communities, while refugee households have better access to health facilities, petty trade and crop and livestock markets than host households. The better a household's access to physical productive assets (including livestock), the better its food security outcomes (see Table A8).

Refugee households are twice as likely to resort to negative coping mechanisms in the face of food shortages than host community households. Among the negative coping mechanisms adopted are relying on less preferred or less expensive foodstuffs, limiting the size of portions, reducing the number of meals eaten in a day and accepting food in return for labour. As these mechanisms result in a decrease in the food security level of households (see CSI scores in Annex III, Table A8), efforts to improve livelihoods should ensure adequate food consumption for both refugee and host communities.

Figure 8. **Food sources for refugee and host community households (average shares of overall food sourced)**



Source: Authors' own calculation

Box 1. **Integrated Food Security Phase Classification (IPC) for Congo**[5]

- In August 2018, 13.1 million people in Congo (23 percent of the rural population in 101 out of the 145 territories in the country) were estimated to face an "acute food and livelihood crisis" (IPC phase 3) or a "humanitarian emergency" (IPC phase 4). Areas affected by recent armed and inter-ethnic conflicts continue to be the most vulnerable to acute food insecurity; they include the Djugu territories in the province of Ituri, which are among the nine territories classified as IPC Phase 4.
- A number of factors have led to the deterioration in the overall food security situation in Congo, including the sharp rise in armed conflicts since 2017, particularly in the Ituri and South Kivu provinces. These conflicts have caused refugee flows into Uganda from the east of Congo, with many refugees being placed in settlements in south-west and mid-west Uganda. In 2018, 14 percent of the country's health zones (including Beni, Butembo, Irumu and Kisangani) were "borderline food insecure" or "stressed" (IPC phase 2), up from 7.5 percent in 2017. These zones are characterized by limited access to health services, especially for pregnant and lactating women and children, and a lack of livelihood options in rural economies. In Ituri and South Kivu, nearly half of the corn crop was lost to fall armyworm and other pests in 2018, reducing food consumption at the household level.
- The high level of general poverty in rural areas limits households' ability to access basic services and buy foodstuffs rich in micro-nutrients and animal proteins.

[5] Additional information on the food security situation worldwide can be found on the website of the Integrated Food Security Phase Classification (IPC), www.ipcinfo.org (IPC, 2019).

Implications for policymaking and programming

- Interventions should improve refugees' access to sanitation (including waste management facilities) and health services, to guarantee their food security. Basic services, such as the provision of market infrastructure, must to be developed in host communities, in line with national and district development plans.
- To ensure that refugee households make the transition from being dependent on food aid to self-reliance, livelihood assistance should help households diversify their crops and their sources of income. Refugee households should start producing agricultural products immediately after arriving, to diversify their food supplies. Later, livelihood assistance should provide information and training on post-harvest management practices and the management of food stocks.
- Humanitarian and development assistance should be grounded in studies into the drivers of vulnerability and resilience; it should target recipients on the basis of vulnerability rather than time spent as a refugee, to help households graduate from humanitarian assistance to self-reliance.

3 METHODOLOGY AND COVERAGE

The food security and resilience analysis in this report is based on data gathered in two districts in south-west Uganda in March 2018. The data were collected through surveys of both refugee and host community households, coordinated by the Resilience Measurement Unit (RMU) of the Office of the Prime Minister (OPM).

The survey covered a total of 705 households from refugee and host communities (see Table 2). It was conducted in the settlements of Kyaka II and Rwamwanja (housing refugees from Burundi and the DRC, among other countries), as well as nearby host communities in the districts of Kyegegwa (for Kyaka II) and Kamwenge (for Rwamwanja).

The survey was based on cluster sampling, the method used for the first assessment of the resilience of refugee and host communities, carried out in Northern Uganda in 2017. Settlements and villages were used as primary sampling units (PSU), and households as second sampling units (SSU). Households were selected randomly from either a list of households provided by the local authorities or by walking through the village or settlement. The samples are representative at district and settlement levels.

Table 2. **Number of sampled households, by district and type**

District type	Kyegegwa District (Kyaka II Settlement)	Kamwenge District (Rwamwanja settlement)	Total
Refugee	202	193	395
Host community	158	152	310

Source: Authors' own calculation

The questionnaire used for the household survey was based on that used for the first assessment in Northern Uganda (FAO, 2018) and comprises several thematic sections:

1. socio-demographic characteristics of households;
2. food security, including a detailed food consumption module, and well-being;
3. shocks, assistance, perceived resilience capacity, coping strategies and aspirations;
4. access to basic services;
5. employment; and
6. agricultural and livestock production, comprising questions regarding the land which a household owns or over which is has user rights.

A training workshop for enumerators and focal supervisors from FAO and RMU was held prior to the collection of the data.

Twenty enumerators, organized into two teams, carried out the fieldwork from 2 to 23 March 2018. The data were collected through computer-assisted personal interviewing (CAPI) with digital tablets. The use of electronic devices reduces the duration of interviews, limits errors during the interview and data entry phases, and enables the collection of geographic information system (GIS) information at the household level. The data were transmitted daily through Kobo Toolbox, a suite of software tools for data collection in challenging environments, allowing for the use of remote data control protocols.

The resilience analysis was conducted based on the FAO-RIMA-II approach (see Annexes II and III), whereby scores for FAO's four pillars of resilience (access to basic services or ABS, assets or AST, social safety nets or SSN and adaptive capacity or AC), as well as the RCI, are calculated by using statistical techniques to infer the value of latent variables. Regression models were used to analyse the determinants of food security, as well as the effects of shocks thereon (FAO, 2016).

4 NEXT STEPS

This survey was conducted to provide a benchmark to analyse baseline indicators and monitor the resilience of refugee and host communities in south-west Uganda. FAO makes all data available to partners and stakeholders (e.g. refugee organizations), so that additional analyses of specific data can be performed as required.

The research findings and the recommendations that emerge from RIMA are used by FAO to provide evidence-based, technical leadership in efforts towards the strengthening of livelihoods of both refugee and host communities. This is consistent with the 2019–2020 Refugee Response Plan (coordinated by the OPM and UNHCR), which is framed in Pillar 3 of Uganda's CRRF ("resilience and self-reliance").

Additional comparative assessments will be carried out in Northern and south-west Uganda to examine the drivers behind the differences in the resilience of older and newer settlements. This analysis will help identify programme priorities, especially for building livelihoods. The resulting report will be widely disseminated through various platforms and information channels; it will provide information to FAO and its partners as to how to build resilience among refugee and host community populations. Under FAO's technical leadership, the Livelihoods and Resilience Sector Working Group is using a number of indicators of the RCI to measure progress towards the strengthening of self-reliance and resilience among refugee and host populations. This is consistent with the adoption of the RIMA methodology by the Government of Uganda as a key tool to measure resilience. The RIMA methodology foresees an impact evaluation at the end of 2020 to measure the contribution of the Government's refugee response to the objectives of the CRRF.


© FAO / Ny You

REFERENCES

Development Pathways. 2018. *The Analysis of Refugee Vulnerability in Uganda and Recommendations for Improved Targeting of Food Assistance.* Orpington, UK (also available at https://data2.unhcr.org/en/documents/download/65880).

FAO. 2011. *Global livestock production systems.* Rome. 171 pp. (also available at www.fao.org/3/i2414e/i2414e.pdf).

FAO. 2016. RIMA-II: *moving forward the development of the resilience index measurement and analysis model.* Rome. 4 pp. (also available at www.fao.org/3/a-i5298e.pdf).

FAO. 2018. *Food security, resilience and well-being analysis of refugees and host communities in Northern Uganda.* FAO Resilience Analysis Report No. 12. Rome. 78 pp. (also available at www.fao.org/3/i9708en/I9708EN.pdf).

FAO. 2019. *Integrated Food Security Phase Classification.* In: *FAO and EU Partnership* [online]. Rome. [Cited 22 November 2018]. www.fao.org/europeanunion/eu-projects/ipc/en

FAO and World Food Programme (WFP). 2014. *Resilience measurement principles. Toward an agenda for measurement design.* Food Security Information Network Technical Series No. 1. Rome. 35 pp. (also available at www.fsincop.net/fileadmin/user_upload/fsin/docs/resources/FSIN_29jan_WEB_medium%20res.pdf).

Integrated Food Security Phase Classification (IPC). 2018. *République Démocratique du Congo (RDC). Situation actuelle de l'insécurité alimentaire aiguë. Août 2018.* [online]. Rome. [Cited 22 November 2018]. www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/IPC_DRC_AFI_2018August.pdf.

Integrated Food Security Phase Classification (IPC). 2019. *Integrated Food Security Phase Classification.* [online]. Rome. [Cited 22 November 2018]. www.ipcinfo.org.

Makate, C., Wang, R., Makate, M. & Mango, N. 2016. Crop diversification and livelihoods of smallholder farmers in Zimbabwe: adaptive management for environmental change. *Springerplus*, 5:1135. (also available at https://springerplus.springeropen.com/articles/10.1186/s40064-016-2802-4).

National Agricultural Research Organization (NARO). Fall army worm outbreak reported in Uganda. In: *NARO.* [Cited 05 January 2019]. http://naro.go.ug/new/news/fall-army-worm-outbreak-reported-in-uganda

Njuki, J., Poole, J., Johnson, N., Baltenweck, I., Pali, P., Lokman, Z. & Mburu, S. 2011. *Gender, livestock and livelihood indicators.* Nairobi and Addis Ababa, International Livestock Research

Institute (ILRI). (also available at https://cgspace.cgiar.org/bitstream/handle/10568/3036/Gender%20Livestock%20and%20Livelihood%20Indicators.pdf).

REACH and Office of the United Nations High Commissioner for Refugees (UNHCR). 2018. *Joint Multi-Sector Needs Assessment. Identifying humanitarian needs among refugee and host community populations in Uganda.* Geneva. (also available at https://data2.unhcr.org/en/documents/download/65982).

Uganda. 2006. The Refugees Act. Acts Supplement to the Uganda Gazette No.47 Volume XCVIX dated 4 August 2006. (also available at www.judiciary.go.ug/files/downloads/Act%20No.%2021of%202006%20Refugees%20Act2006.pdf).

Uganda. 2010. *The refugees regulations.* Statutory Instruments 2010 No. 9. (also available at www.refworld.org/docid/544e4f154.html).

Uganda. 2018. *Roadmap for the implementation of the Comprehensive Refugee Response Framework in Uganda 2018–2020.* (also available at www.globalcrrf.org/wp-content/uploads/2018/04/a60e187285683322e0f70daec94c448eecb932c3.pdf).

Uganda, Office of the Prime Minister (OPM). 2018. *OPM and UNHCR announce the preliminary results of the verification exercise.* Joint Press Statement. 8 November 2018. In: News and Events [online]. Kampala. [Cited 23 November 2018]. https://opm.go.ug/2018/11/08/opm-and-unhcr-announce-the-preliminary-results-of-the-verification-exercise).

United Nations World Bank. 2017. *ReHoPE — Refugee and host population empowerment strategic framework – Uganda.* New York, United Nations and Washington, DC, World Bank. (also available at https://reliefweb.int/sites/reliefweb.int/files/resources/64166_0.pdf).

United Nations High Commission for Refugees (UNHCR). 2018. Uganda. Total refugees. In: [online]. Geneva. [Cited 10 October 2018]. https://ugandarefugees.org/en/country/uga

World Bank. 2018. *Closing the Potential-Performance Divide in Ugandan Agriculture.* Washington, DC. (also available at http://documents.worldbank.org/curated/en/996921529090717586/pdf/127252-WP-PUBLIC-UG-AgGAP-Final-Synthesis-Report-FINAL-lowres.pdf).

World Food Programme (WFP). 2008. *Technical guidance sheet. Food consumption analysis. Calculation and use of the food consumption score in food security analysis.* Rome. (also available at https://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp197216.pdf?_ga=2.152562617.1862590290.1545125550-2080251870.1545125550).

World Organisation for Animal Health (OIE). 2018. Foot and mouth disease, Uganda. In: *World Animal Health Information Database (WAHIS) Interface* [online]. Paris. [Cited 8 April 2019]. www.oie.int/wahis_2/public/wahid.php/Reviewreport/Review?page_refer=MapFullEventReport&reportid=29932

OIE. 2018. Rift Valley fever, Uganda. In: *World Animal Health Information Database (WAHIS) Interface* [online]. Paris. [Cited 8 April 2019]. www.oie.int/wahis_2/public/wahid.php/Reviewreport/Review?page_refer=MapFullEventReport&reportid=29931

OIE. 2018. Anthrax, Uganda. In: *World Animal Health Information Database (WAHIS) Interface* [online]. Paris. [Cited 8 April 2019].www.oie.int/wahis_2/public/wahid.php/Reviewreport/Review?page_refer=MapFullEventReport&reportid=26699

© FAO/ Stefanie Glinski

ANNEX I
RESILIENCE MEASUREMENT

Following the RIMA-II approach (FAO, 2016), the estimation of the RCI is based on a two-stage procedure.

1. First, the resilience pillars are estimated from observed variables through Factor Analysis (FA). The definition of each pillar of resilience and the related variables are reported below in Table A3.
2. Second, the RCI is estimated from the pillars, taking into account the indicators of food security using the Multiple Indicators Multiple Causes (MIMIC) model. The food security indicators are considered outcomes of resilience.

After estimating the pillars, the RCI is jointly estimated through its pillars and by taking into account the food security indicators. The results of the MIMIC model are shown in Table A1. The model presents a good fit to the data; all the pillars' coefficients are positive and statistically significant with the exception of the ABS pillar.

After estimating the RCI, a min-max scaling is used to transform the RCI value into a standardized index, ranging between 0 and 100. The linear scaling is based on:

$$RCI^{*} = (RCI - RCI_{min}) / (RCI_{max} - RCI_{min}) \quad (1)$$

The descriptive resilience analysis provides a description of household resilience capacity, namely the RCI and RSM. The latter shows the correlation between the RCI and the pillars and between the observed variables and the pillars.

In order to study the determinants of the food security indicators employed for estimating the RCI, the following OLS model is adopted:

$$FS_{h} = \alpha + \beta \boldsymbol{R}_{h} + \delta \boldsymbol{X}_{h} + \varepsilon_{h} \quad (2)$$

Where $\boldsymbol{R}$ is a vector of all variables employed for estimating the resilience pillars, $\boldsymbol{X}$ is a vector of household control characteristics, which includes LGA dummies, and ε is an error term. Different models are estimated, for food expenditure per capita and HDDS. Table A2 summarizes the empirical results.

Table A1. **Variables employed in the estimation of RCI**

Pillar	Variable	
ABS **Ability of a household to meet basic needs, by accessing and effectively using basic services,such as sending children to school; accessing water, electricity and sanitation; selling products at the market.**	Improved sanitation	Variable indicating access to improved toilet facility (covered pit latrine private, private ventilated improved pit latrine, and private flush toilet).
	Improved water	Variable indicating access to an improved water source (piped dwelling, piped public tap, protected shallow well, borehole, protected spring, roof rain water).
	Closeness to primary school	Index of closeness to primary school. The index ranges between 0 (no access) and 1 (minimum distance in kilometres).
	Closeness to hospital	Index of closeness to hospital/health facility. The index ranges between 0 (no access) and 1 (minimum distance in kilometres).
	Closeness to livestock market	Index of closeness to livestock market. The index ranges between 0 (no access) and 1 (minimum distance in kilometres).
	Closeness to agricultural market	Index of closeness to agricultural market. The index ranges between 0 (no access) and 1 (minimum distance in kilometres).
AST **Assets, both productive and non-productive, are the key elements of a livelihood, since they enable households to produce and consume goods.**	Wealth index	The wealth index is created through FA. A list of variables assumes a value of 1 or 0 is used, depending on whether or not a household has specific non-productive assets, such as a radio, lamp, mobile, bicycle, table, chairs, bed, hand mill, mattress, solar panel, water tank or jerry cans.
	Agricultural asset index	The agricultural asset index is created through FA. A list of variables assumes a value of 1 or 0 is used, depending on whether or not a household has specific productive assets, such as an axe, plough, hoe, sickle, rake, cart, ox plough and other assets.
	TLU per capita	TLU standardizes different types of livestock into a single unit of measurement.*
	Land per capita	Total area employed for crop production.
SSN **Capacity of the household to access formal and informal assistance from institutions, as well as from relatives and friends.**	Credit (value) per capita	Total amount (USD) of loans received in the last 12 months.
	Past credit (value) per capita	Total amount (USD) of loans contracted before the last 12 months.
	Formal transfers (value) per capita	Total amount (USD) of formal transfers received in the last 12 months. They include cash for work programmes, food for work programmes carried out by non-governmental organizations (NGOs), benefits from elderly people schemes, Social Action Grant funds, scholarships, and social action for elderly programmes.
	Informal transfers (value) per capita	Total amount (USD) of informal transfers received in the last 12 months. They include help from family members and in-laws, remittances, gifts and borrowing from friends and relatives.
AC **Ability to adapt to a new situation and develop new livelihood strategies**	Average years of education	Average years of education of household members.
	Share of active members	The dependency ratio is the share of household members actively employed (>15 and <64 years old) over the household size.
	CSI	The CSI is a weighted sum of the number of days the household adopted different strategies* to cope with food shortage in the past week.
	Number of income-generating activities	Sum of the different sources of income for the household. A list of variables assumes a value of 1 or 0 is used, depending on whether or not a household has been involved in farming activity; wage employment; sale of livestock, or their products; non-farm enterprise; a household has received transfers; rent, the sale of assets or other income sources.
	Number of crops	Sum of the different crops cultivated by the household during the last season.

Pillar	Variable	
Food security	Food consumption per capita	Monetary value (USD) of per capita food consumption, including bought, own-produced, received for free (as gifts or part of a conditional project) and food stored over the last month.
	HDDS	Number of food groups consumed by the household during the previous seven days.*

* The conversion factor adopted is: 0.7 camel; 0.5 cattle; 0.3 donkeys /mules; pigs 0.2; 0.1 sheep/goats; 0.01 chickens.

** The strategies are weighted as a figure of 1-4 (according to focus group discussions implemented in the Ugandan region of Moroto during enumerator training carried out during November 2016), including the following: 1) Rely on less preferred or less expensive food – 2; 2) Purchase food on credit – 1; 3) Borrow food, or rely on help from a relative – 2; 4) Gather wild foods, "famine foods" or hunt – 3; 5) Harvest and consume immature crops – 4; 6) Consume seed stock that will be needed for next season – 4; 7) Send household member elsewhere – 3; 8) Limit portion size at meal time – 3; 9) Reduce consumption by adults in order for small children to eat – 2; 10) Reduce consumption by others so working members could eat – 2; 11) Go one entire day without eating – 4; 12) Sell livestock – 3; 13) Reduce number of meals eaten in a day – 3; 14) Beg for food – 3; 15) Selling assets (other than livestock) – 3; 16) Increase the selling of firewood and charcoal – 3; 17) Rely on casual labour – 2; 18) School enrolment for children (even not at school-going-age) – 3; 19) Ask for loans from Villages Savings and Loans Associations (VSLAs) and other institutions – 2. The CSI adopted in the resilience estimation is equal to 1/CSI.

*** The food groups considered in the HDDS are the following: cereals, tubers, vegetables, fruits, meat, egg, fish, pulses, milk, oil, sugar, miscellaneous (Swindale and Bilinsky, 2006).

ANNEX II
DESCRIPTIVE STATISTICS

Table A2. **Summary statistics of variables employed for the estimation of the RCI**

Variable	Obs	Mean	Std.Dev	Min	Max
Sanitation improved (dummy) - with mobile toilet for refugees	705	0.597	0.491	0.000	1.000
Water improved (dummy)	705	0.769	0.422	0.000	1.000
Distance (min.) to primary school (inverse)	705	0.582	0.301	0.077	1.000
Distance (min.) to hospital / health facility (inverse)	705	0.338	0.252	0.050	1.000
Distance (min.) to livestock market (inverse)	705	0.342	0.332	0.011	1.000
Distance (min.) to agricultural market (inverse)	705	0.618	0.366	0.038	1.000
Distance (min.) to petty trading market (inverse)	705	0.847	0.254	0.125	1.000
Distance (min.) to primary school (actual)	705	2.395	1.681	1.000	13.000
Distance (min.) to secondary school (actual)	705	5.523	3.879	1.000	40.000
Distance (min.) to hospital / health facility (actual)	705	4.693	3.214	1.000	20.000
Distance (min.) to livestock market (actual)	590	7.420	5.851	1.000	-
Distance (min.) to agricultural market (actual)	590	3.465	3.368	1.000	-
Distance (min.) to petty trading market (actual)	704	1.449	1.022	1.000	-
Durable assets house index	705	0.643	0.269	0.000	1.141
Agri assets index	705	0.346	0.264	-0.022	1.017
Land used for cropping (hectares)	705	1.367	1.330	0.000	8.500
Tropical Livestock Unit	705	0.416	1.673	0.000	25.000
Access to current credit (value)	705	3.692	11.077	0.000	90.000
Access to past current credit (value)	705	3.522	10.538	0.000	90.000
Formal transfers (value)	705	3.752	5.552	0.000	40.000
Informal transfers (value)	705	0.682	2.352	0.000	30.000
Participation in associations	705	0.539	0.499	0.000	1.000
Average years of education	705	4.798	3.801	0.000	15.000
Participation in training (dummy)	705	0.216	0.412	0.071	1.000
CSI (inverse)	705	0.152	0.267	0.004	1.000
Income activities diversification index	705	2.174	0.959	0.000	5.000
N. crops produced	705	3.033	1.956	0.000	13.000
Food expenditure pc (monthly USD)	705	6.312	5.375	0.000	38.470
Food consumption pc (monthly USD)	705	15.621	9.936	0.376	71.884
Caloric intake pc	705	1971.220	738.759	373.286	4328.333
Simpson index	705	0.610	0.132	0.001	0.844
Shannon index	705	1.162	0.330	0.003	1.976
Food Consumption Score (FCS)	705	49.858	17.062	10.000	121.500
Household Dietary Diversity Score (HDDS)	705	6.508	2.155	2.000	12.000
Gender of HH head	705	0.765	0.425	0.000	1.000
Marital status HH head	705	0.752	0.432	0.000	1.000
Femhead de jure	705	0.721	0.449	0.000	1.000
Refugee population (dummy)	705	0.440	0.497	0.000	1.000
Drought	705	0.474	0.500	0.000	1.000
Floods / Water logging / Storm	705	0.018	0.135	0.000	1.000
Water shortage	705	0.289	0.454	0.000	1.000

Variable	Obs	Mean	Std.Dev	Min	Max
Unusually high level of crop pests & disease	705	0.274	0.446	0.000	1.000
Unusually high level of livestock disease	705	0.104	0.305	0.000	1.000
Unusually high costs of agricultural inputs	705	0.061	0.239	0.000	1.000
Unusually low prices of agricultural output	705	0.160	0.367	0.000	1.000
Serious illness of accident of income earner(s)	705	0.060	0.237	0.000	1.000
Serious illness of accident of other household member(s)	705	0.160	0.367	0.000	1.000
Death of other household member(s)	705	0.021	0.144	0.000	1.000
Theft of money/valuables/non-agricultural assets	705	0.067	0.250	0.000	1.000
Theft of agricultural assets/output (crop or livestock)	705	0.112	0.316	0.000	1.000
Conflict/Violence	705	0.040	0.195	0.000	1.000
Fire	705	0.003	0.053	0.000	1.000
Other shocks	705	0.143	0.351	0.000	1.000
Variable	**Obs**	**Percent**	**Std.Dev**	**Min**	**Max**
Self-reported livelihood (Agro-pastoralist)	201	28.51			
Self-reported livelihood (Farmer)	475	15.621			
Self-reported livelihood (Other)	29	4.11			

Table A3. **By settlement**

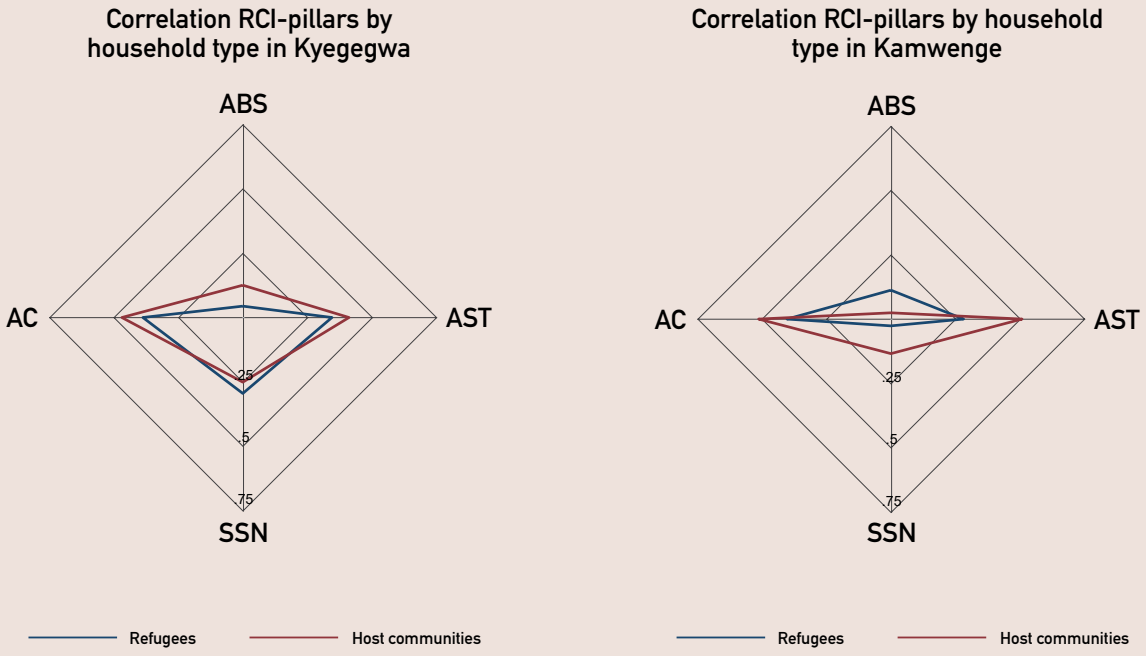
Variable	Kyaka II (n=202)	Rwamwanja (n=193)	ttest
RCI	43.514	36.987	***
Sanitation improved (dummy) - with mobile toilet for refugees	0.475	0.456	
Water improved (dummy)	0.906	0.964	**
Distance (min.) to primary school (inverse)	0.055	0.048	
Distance (min.) to hospital / health facility (inverse)	0.025	0.041	***
Distance (min.) to livestock market (inverse)	0.119	0.423	***
Distance (min.) to agricultural market (inverse)	0.275	0.221	
Distance (min.) to petty trading market (inverse)	0.190	0.184	
Durable assets house index	0.681	0.432	***
Agri assets index	0.386	0.230	***
Tropical Livestock Unit	0.128	0.079	**
Land used for cropping (hectares)	0.909	0.607	***
Participation in associations	0.371	0.601	***
Current credit (value)	4.077	3.584	
Access to past current credit (value)	2.295	6.694	***
Formal transfers (value)	4.746	7.473	***
Informal transfers (value)	1.108	0.377	***
Average years of education	3.992	3.153	**

Variable	Kyaka II (n=202)	Rwamwanja (n=193)	ttest
Dependency ratio	0.521	0.504	
CSI (inverse)	0.079	0.123	**
Income activities diversification index	2.203	2.358	*
N. crops produced	2.436	2.041	**
Participation in training (dummy)	0.252	0.280	
Shannon	1.150	1.028	***
Food consumption pc (monthly USD)	14.794	13.858	
FCS	45.460	43.326	*

Table A4. **By household type**

Variable	Refugee; n=395	Host; n=310	ttest	Difference (refugee-host)
RCI	40.325	53.526	***	-13.202
Sanitation improved (dummy)	0.466	0.765	***	-0.299
Water improved (dummy)	0.934	0.558	***	0.376
Distance (min.) to primary school (inverse)	0.052	0.056		-0.004
Distance (min.) to hospital / health facility (inverse)	0.033	0.025	**	0.008
Distance (min.) to livestock market (inverse)	0.268	0.019	***	0.249
Distance (min.) to agricultural market (inverse)	0.248	0.188	**	0.061
Distance (min.) to petty trading market (inverse)	0.187	0.133	***	0.054
Durable assets house index	0.559	0.751	***	-0.192
Agri-assets index	0.310	0.391	***	-0.082
Tropical Livestock Unit	0.104	0.504	***	-0.400
Land used for cropping (hectares)	0.761	2.038	***	-1.276
Participation in associations	0.484	0.610	***	-0.126
Current credit (value)	3.836	3.508		0.328
Access to past current credit (value)	4.444	2.347	**	2.098
Formal transfers (value)	6.079	1.861	***	4.217
Informal transfers (value)	0.751	0.594		0.157
Average years of education	3.582	6.347	***	-2.765
Dependency ratio	0.512	0.525		-0.013
CSI (inverse)	0.101	0.217	***	-0.117
Income activities diversification index	2.278	2.168		0.111
N. crops produced	2.243	4.039	***	-1.796
Participation in training (dummy)	0.266	0.152	***	0.114
Shannon	1.090	1.256	***	-0.166
Food consumption pc (monthly USD)	14.337	17.259	***	-2.922
FCS	44.418	56.790	***	-12.373

Figure A1. **Correlation pillar to RCI by district**



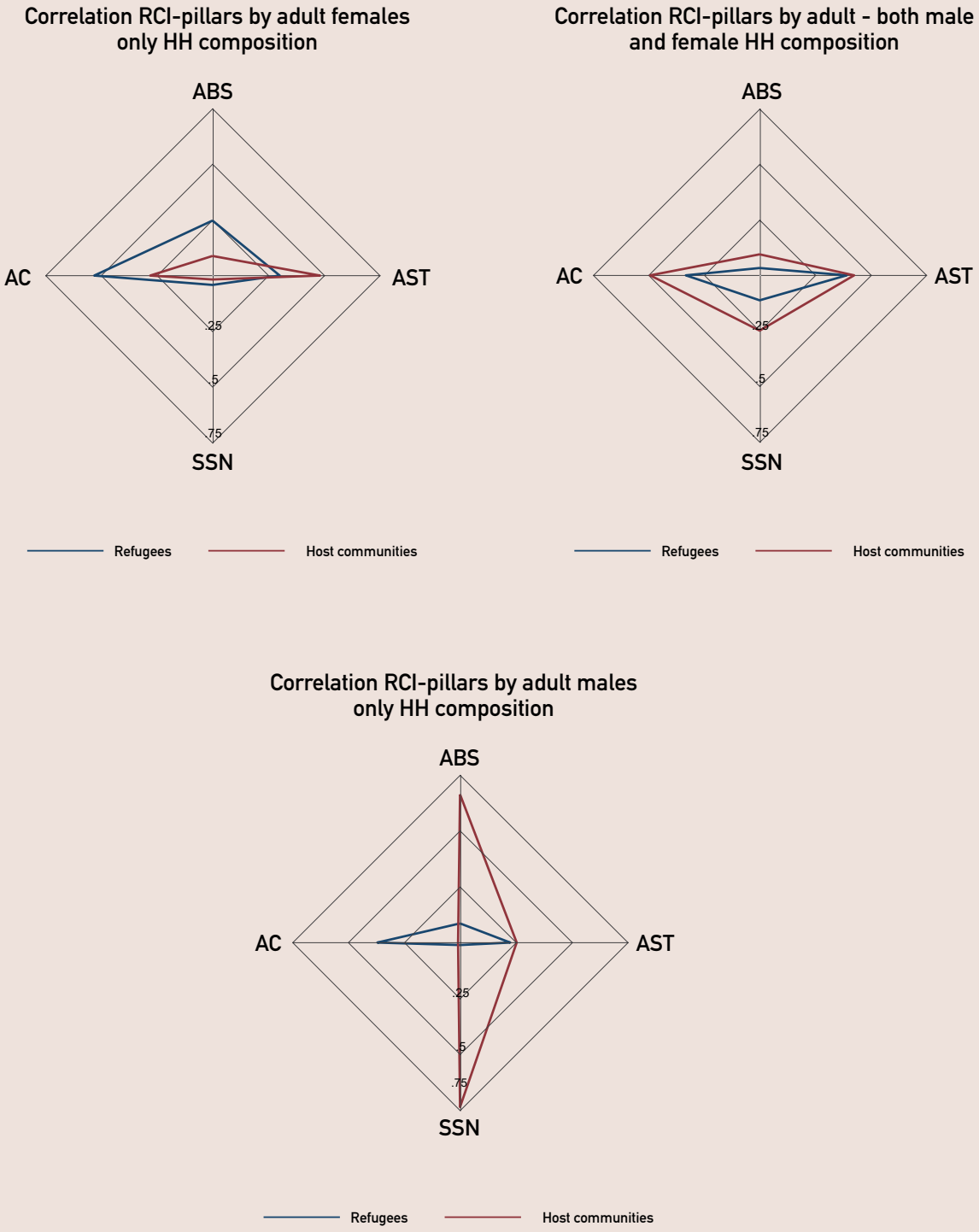
Source:
Authors' own calculation

Table A5. **By household composition (mixed, only adult-females, only adult-males)**

Variable	Refugee			Anova	Host community			Anova
	Adult both male and female (305)	Adult females only (67)	Adult males only (23)		Adult both male and female (257)	Adult females only (47)	Adult males only (6)	
	41.242	35.817	41.294	**	55.510	44.509	39.184	***
Sanitation improved (dummy) - with mobile toilet for refugees	0.482	0.388	0.478		0.778	0.723	0.500	
Water improved (dummy)	0.941	0.910	0.913		0.549	0.638	0.333	
Distance (min.) to primary school (inverse)	0.052	0.048	0.061		0.056	0.050	0.066	
Distance (min.) to hospital / health facility (inverse)	0.033	0.035	0.029		0.023	0.033	0.022	
Distance (min.) to livestock market (inverse)	0.265	0.265	0.319		0.019	0.021	0.022	
Distance (min.) to agricultural market (inverse)	0.229	0.305	0.341		0.205	0.112	0.054	
Distance (min.) to petty trading market (inverse)	0.175	0.227	0.226		0.129	0.153	0.119	
Durable assets house index	0.598	0.430	0.418	***	0.777	0.604	0.796	***
Agri assets index	0.322	0.274	0.250		0.408	0.310	0.301	**
Tropical Livestock Unit	0.122	0.051	0.026	**	0.542	0.348	0.105	
Land used for cropping (hectares)	0.832	0.497	0.599	***	2.167	1.363	1.770	**

Variable	Refugee			Anova	Host community			Anova
	Adult both male and female (305)	Adult females only (67)	Adult males only (23)		Adult both male and female (257)	Adult females only (47)	Adult males only (6)	
Participation in associations	0.538	0.328	0.217	***	0.642	0.489	0.167	**
Current credit (value)	3.962	2.955	4.728		3.082	5.330	7.500	
Access to past current credit (value)	4.686	3.224	4.793		2.195	2.202	10.000	*
Formal transfers (value)	5.938	6.184	7.640		1.140	6.042	0.000	*
Informal transfers (value)	0.656	1.128	0.915		0.463	1.290	0.750	*
Average years of education	3.740	2.821	3.696		6.760	4.393	3.944	***
Dependency ratio	0.502	0.452	0.826	***	0.540	0.412	0.756	***
CSI (inverse)	0.107	0.068	0.114		0.230	0.147	0.222	
Income activities diversification index	2.357	1.955	2.174	***	2.191	2.064	2.000	
N. crops produced	2.338	1.925	1.913	**	4.257	2.936	3.333	***
Participation in training (dummy)	0.289	0.134	0.348	**	0.175	0.043	0.000	**
Shannon	1.104	1.032	1.076		1.286	1.136	0.943	***
Food consumption pc (monthly USD)	13.389	14.891	25.283	***	17.080	17.305	24.555	
FCS	45.300	41.664	40.739	**	58.420	49.989	40.250	**

Figure A2. **Correlation RCI-pillars by HH composition**

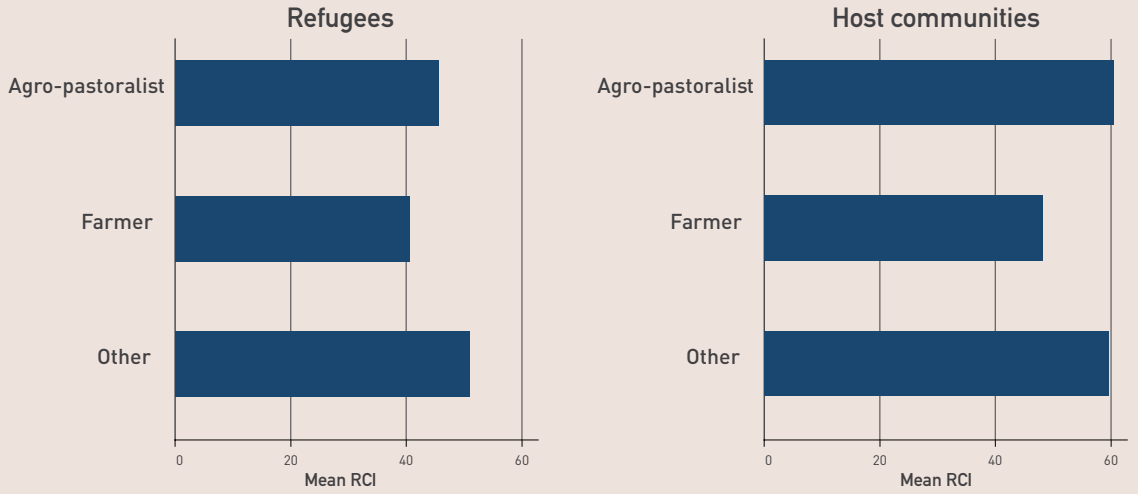


Source:
Authors' own calculation

Table A6. **By self-reported livelihood**

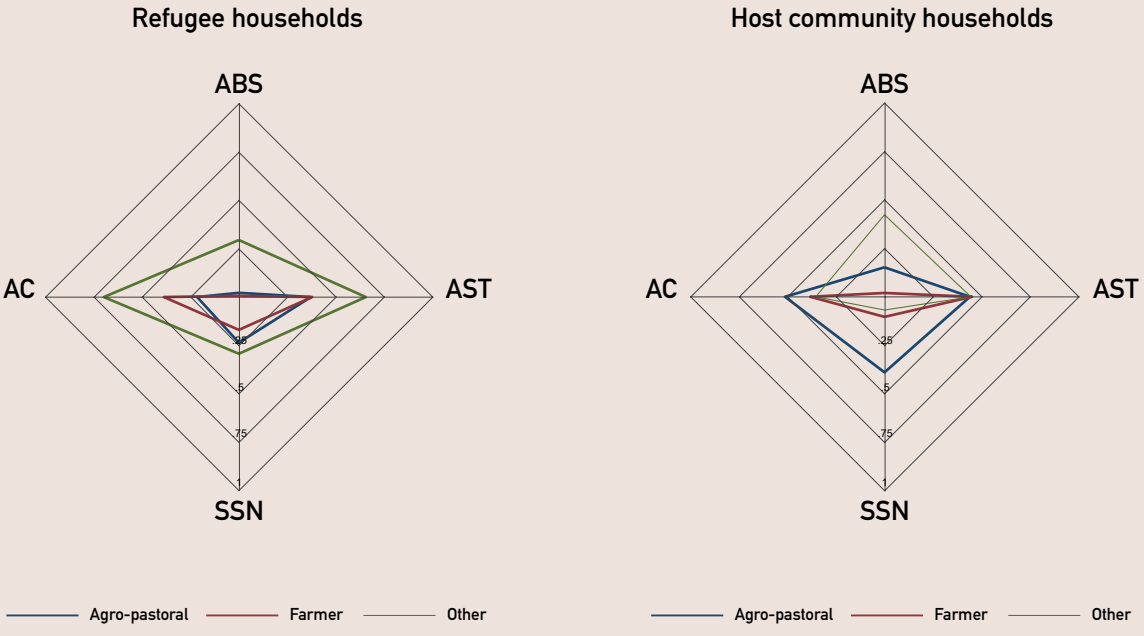
Variable	Refugee			Anova	Host community			Anova
	Agro-pastoralist (n=86)	Farmer (n=294)	Urban (n=15)		Agro-pastoralist (n=115)	Farmer (n=181)	Urban (n=14)	
RCI	43.699	38.905	48.809	**	60.786	48.442	59.625	
Sanitation improved (dummy) - with mobile toilet for refugees	0.605		0.600		0.861	0.707	0.714	
Water improved (dummy)	0.953	0.929	0.933		0.530	0.547	0.929	
Distance (min.) to primary school (inverse)	0.048	0.052	0.072		0.054	0.057	0.055	
Distance (min.) to hospital / health facility (inverse)	0.026	0.034	0.045		0.022	0.018	0.137	***
Distance (min.) to livestock market (inverse)	0.175	0.278	0.606		0.020	0.018	0.034	
Distance (min.) to agricultural market (inverse)	0.155	0.249	0.759		0.138	0.225	0.109	
Distance (min.) to petty trading market (inverse)	0.198	0.166	0.540		0.111	0.119	0.488	
Durable assets house index	0.643	0.538	0.496		0.841	0.707	0.598	
Agri assets index	0.319	0.322	0.009		0.458	0.376	0.050	*
Tropical Livestock Unit	0.293	0.053	0.021	*	0.899	0.292	0.000	
Land used for cropping (hectares)	0.932	0.725	0.500		2.576	1.827	0.341	**
Participation in associations	0.581	0.463	0.333	**	0.748	0.541	0.357	**
Current credit (value)	2.380	3.986	9.250		3.608	3.716	0.000	**
Access to past current credit (value)	4.589	4.302	6.400		2.283	2.569	0.000	
Formal transfers (value)	7.410	5.689	6.075	**	1.746	0.869	15.643	**
Informal transfers (value)	0.564	0.844	0.000		0.681	0.478	1.393	**
Average years of education	3.965	3.482	3.333	**	6.531	6.002	9.298	
Dependency ratio	0.516	0.506	0.618	***	0.549	0.494	0.726	***
CSI (inverse)	0.105	0.095	0.189		0.282	0.163	0.383	
Income activities diversification index	2.453	2.252	1.800		2.304	2.094	2.000	
N. crops produced	2.512	2.231	0.933	***	4.965	3.718	0.571	**
Participation in training (dummy)	0.349	0.245	0.200		0.217	0.110	0.143	**
Shannon	1.136	1.069	1.242		1.349	1.186	1.404	
Food consumption pc (monthly USD)	13.780	14.110	21.968	***	18.306	16.278	21.324	***
FCS	47.541	43.167	51.033		63.252	52.318	61.536	**

Figure A3. **RCI by livelihood**



Source:
Authors' own calculation

Figure A4. **Correlation RCI-pillar by household type**

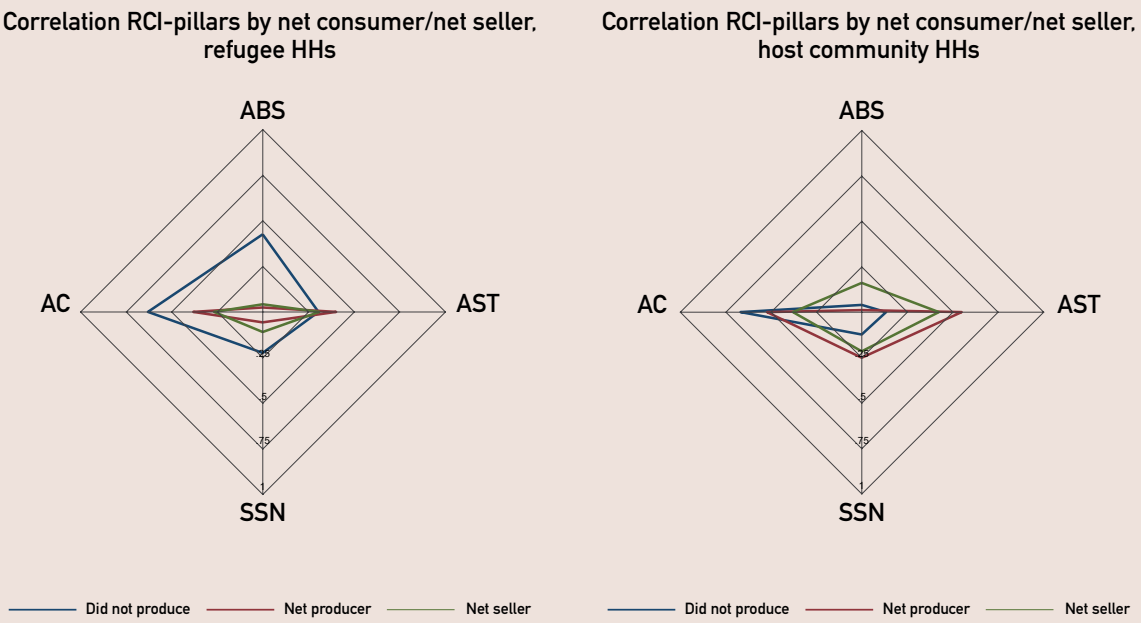


Source:
Authors' own calculation

Table A7. **Resilience by net crop producer/net seller**

Variable	Refugee			Anova	Host community			Anova
	Did not produce (n=42)	Net consumer (n=231)	Net seller (n=122)		Did not produce (n=21)	Net consumer (n=175)	Net seller (n=114)	
RCI	37.974	39.019	43.607	**	53.729	51.845	56.071	
Sanitation improved (dummy) - with mobile toilet for refugees	0.524	0.429	0.516		0.571	0.783	0.772	*
Water improved (dummy)	0.929	0.922	0.959		0.762	0.543	0.544	
Distance (min.) to primary school (inverse)	0.059	0.050	0.052		0.068	0.051	0.061	
Distance (min.) to hospital / health facility (inverse)	0.035	0.033	0.031		0.078	0.019	0.024	***
Distance (min.) to livestock market (inverse)	0.530	0.250	0.212	***	0.029	0.018	0.019	*
Distance (min.) to agricultural market (inverse)	0.688	0.188	0.212	***	0.120	0.189	0.198	
Distance (min.) to petty trading market (inverse)	0.292	0.152	0.217	***	0.381	0.107	0.126	***
Durable assets house index	0.383	0.554	0.629	***	0.621	0.733	0.804	***
Agri assets index	0.174	0.317	0.342	***	0.081	0.404	0.430	***
Tropical Livestock Unit	0.041	0.101	0.132	*	0.221	0.586	0.430	
Land used for cropping (hectares)	0.000	0.749	1.047	***	0.000	1.965	2.525	***
Participation in associations	0.333	0.524	0.459	*	0.333	0.646	0.605	**
Current credit (value)	3.286	2.941	5.720	*	2.286	3.844	3.218	
Access to past current credit (value)	1.286	4.027	6.322	**	1.714	2.169	2.737	
Formal transfers (value)	5.818	5.843	6.614		10.514	1.431	0.928	**
Informal transfers (value)	0.251	0.812	0.809		1.078	0.541	0.587	
Average years of education	2.833	3.548	3.903		7.468	5.841	6.917	**
Dependency ratio	0.617	0.504	0.491	**	0.692	0.501	0.532	**
CSI (inverse)	0.165	0.101	0.078	*	0.405	0.190	0.225	**
Income activities diversification index	1.405	2.290	2.557	***	1.667	2.017	2.491	***
N. crops produced	0.000	2.519	2.492	***	0.000	4.406	4.219	***
Participation in training (dummy)	0.143	0.286	0.270		0.143	0.143	0.167	
Shannon	1.049	1.067	1.148	**	1.291	1.232	1.288	
Food consumption pc (monthly USD)	16.328	13.430	15.366	*	19.541	16.809	17.528	
FCS	44.202	43.610	46.020		57.048	55.743	58.351	

Figure A5. **Correlation RCI-pillars net consumer/net seller by household type**



Source: Authors' own calculation

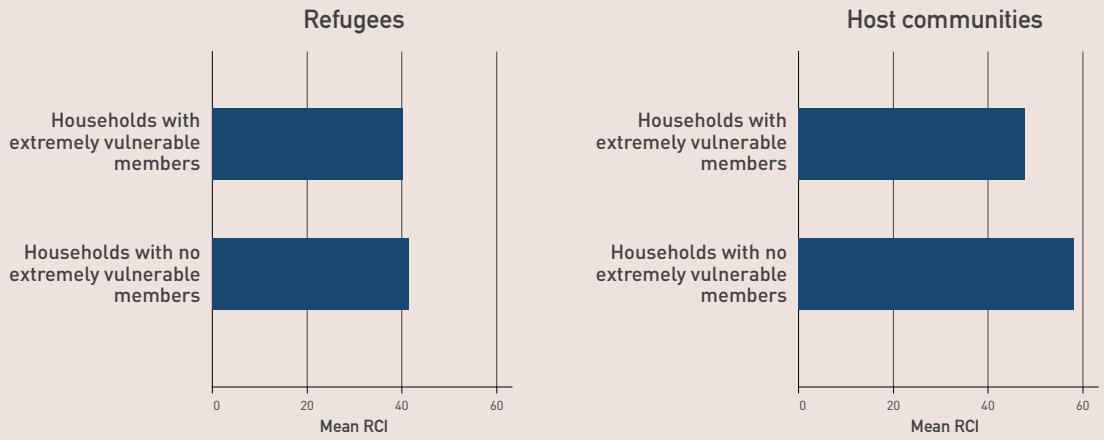
Table A8. **By household composed by extremely vulnerable members**

Widows, elderly, people with health problems. From the household characteristics module for vulnerable members age>65 for elderly, widows in the HH and ailing members from shocks module.

Variable	Refugee		ttest	Host community		ttest
	Households with extremely vulnerable household members (n=93)	Households with no extremely vulnerable household members (n=302)		Households with extremely vulnerable members (n=63)	Households with no extremely vulnerable members (n=247)	
RCI	39.486	40.583		48.758	54.742	**
Sanitation improved (dummy) - with mobile toilet for refugees	0.462	0.467		0.778	0.761	
Water improved (dummy)	0.892	0.947	*	0.603	0.547	
Distance (min.) to primary school (inverse)	0.050	0.052		0.047	0.058	
Distance (min.) to hospital / health facility (inverse)	0.022	0.036	**	0.027	0.024	
Distance (min.) to agricultural market (inverse)	0.111	0.290	***	0.214	0.181	
Distance (min.) to petty trading market (inverse)	0.181	0.189		0.105	0.140	

Variable	Refugee		ttest	Host community		ttest
	Households with extremely vulnerable household members (n=93)	Households with no extremely vulnerable household members (n=302)		Households with extremely Vulnerable Members (n=63)	Households with no extremely vulnerable members (n=247)	
Durable assets house index	0.595	0.548		0.767	0.747	
Agri assets index	0.289	0.316		0.344	0.403	
Tropical Livestock Unit	0.156	0.088	**	0.399	0.530	
Land used for cropping (hectares)	0.879	0.725	**	1.938	2.063	
Participation in associations	0.591	0.450	**	0.619	0.607	
Current credit (value) - USD	4.737	3.559		2.004	3.892	
Access to past current credit (value) - USD	6.078	3.941		2.738	2.247	
Formal transfers (value) - USD	6.073	6.080		1.499	1.954	
Informal transfers (value) - USD	0.611	0.794		0.628	0.586	
Average years of education	3.634	3.566		5.658	6.523	
Dependency ratio	0.491	0.519		0.507	0.530	
CSI (inverse)	0.074	0.109		0.149	0.235	
Income activities diversification index	2.387	2.245		2.190	2.162	
N. crops produced	2.527	2.156	**	3.841	4.089	
Participation in training (dummy)	0.344	0.242	**	0.143	0.154	
Shannon	1.076	1.094		1.193	1.273	
Food consumption pc (monthly USD)	14.682	14.230		15.100	17.809	
FCS	42.726	44.939		52.500	57.885	

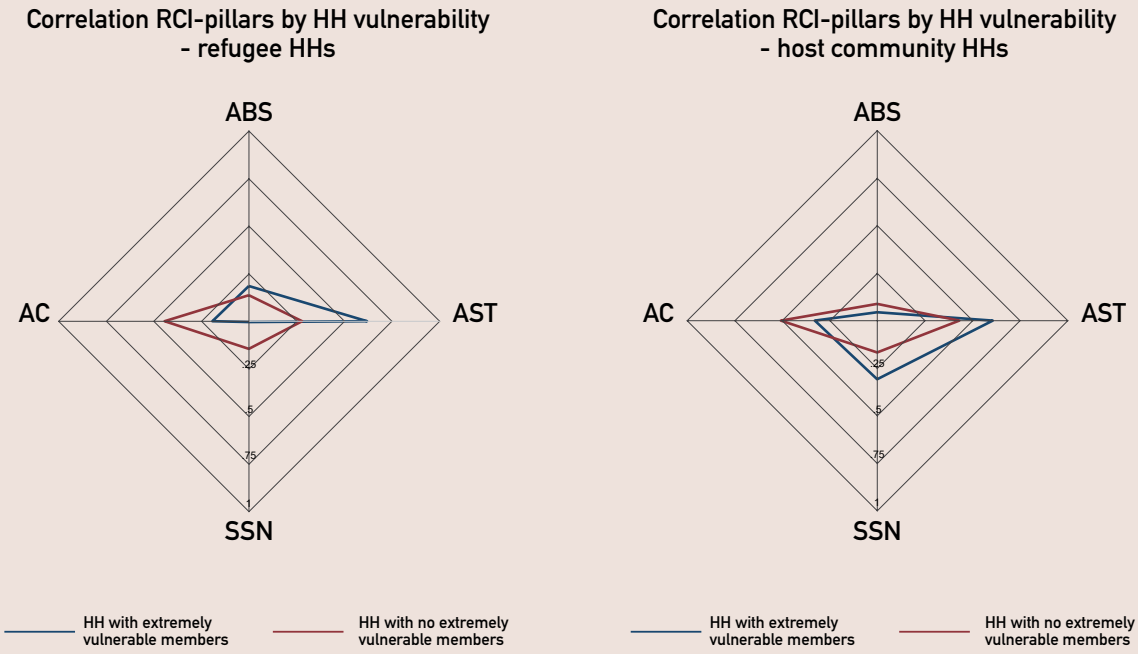
Figure A6. **RCI by household with/without extremely vulnerable members**



Source:
Authors' own calculation

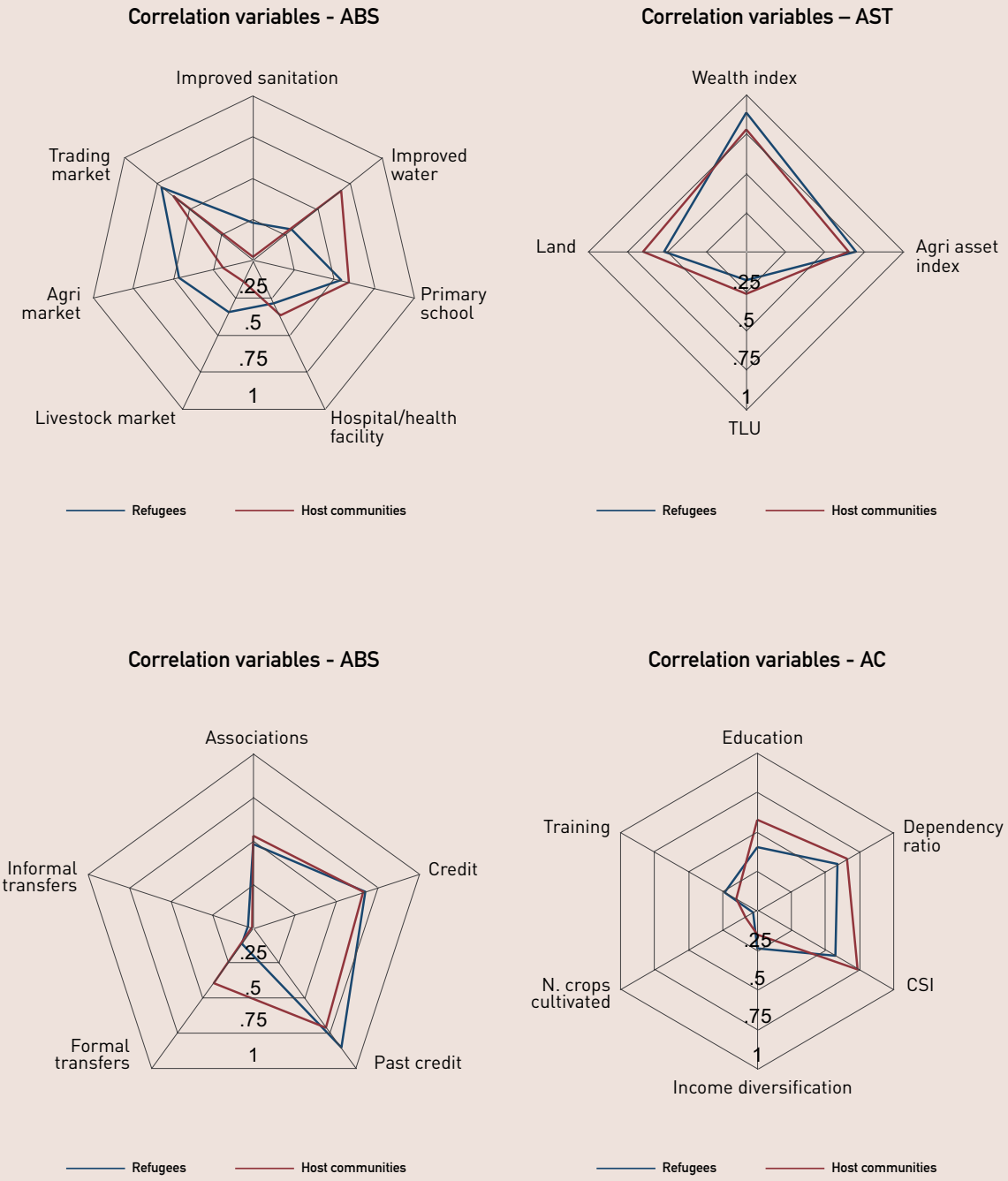
NB: No significant difference in RCI for Refugees; While there is significant difference in RCI** for host communities

Figure A7. **Correlation RCI-pillars by HH vulnerability**



Source:
Authors' own calculation

Figure A8. **Correlation variable to pillar**



Source:
Southwest Resilience Survey (2018)

ANNEX III
REGRESSION ANALYSES

Table A9. **Results of regressions of food security indicators**

	Shannon index	FCS	HDDS	Food consumption (log)
Improved toilet	0.00139 (0.0243)	2.342* (1.219)	0.389*** (0.150)	0.0260 (0.0433)
Improved water	0.0497 (0.0303)	0.610 (1.521)	0.309 (0.188)	0.0705 (0.0541)
Energy source	0.101*** (0.0321)	3.020* (1.611)	0.587*** (0.199)	0.149*** (0.0573)
Closeness to improved water	-0.00457 (0.0237)	-1.219 (1.188)	-0.209 (0.147)	-0.0137 (0.0422)
Closeness to primary school	0.0497 (0.0390)	3.170 (1.959)	0.348 (0.242)	-0.0222 (0.0697)
Closeness to secondary school	0.0494 (0.0464)	2.125 (2.329)	0.423 (0.288)	0.157* (0.0829)
Closeness to hospital/health facility	0.0180 (0.0503)	-4.558* (2.524)	0.185 (0.312)	0.0725 (0.0898)
Closeness to livestock market	-0.0292 (0.0415)	0.691 (2.084)	-0.419 (0.257)	-0.127* (0.0741)
Closeness to agriculture-crops market	-0.0111 (0.0374)	1.688 (1.878)	0.0515 (0.232)	0.00541 (0.0668)
Closeness to petty trading market	-0.0819 (0.0500)	-3.007 (2.509)	-0.297 (0.310)	-0.0934 (0.0892)
Wealth Index	0.278*** (0.0553)	9.479*** (2.778)	1.995*** (0.343)	0.172* (0.0988)
Agricultural assets index	-0.127** (0.0499)	-5.522** (2.505)	-0.633** (0.309)	-0.0216 (0.0891)
TLU	0.0118* (0.00702)	1.657*** (0.353)	0.128*** (0.0435)	-0.0247** (0.0125)
Land	-0.000941 (0.00603)	-0.0288 (0.303)	-0.00331 (0.0374)	-0.0169 (0.0108)
Credit access	-0.0300 (0.0371)	0.150 (1.861)	-0.00256 (0.230)	0.114* (0.0662)
Credit access past	-0.0630* (0.0359)	-1.833 (1.803)	-0.497** (0.223)	-0.0754 (0.0641)
Current credit value	1.49e-07** (7.33e-08)	3.74e-06 (3.68e-06)	8.40e-07* (4.54e-07)	1.20e-07 (1.31e-07)
Formal transfers	-0.000107 (0.000354)	-0.0303* (0.0178)	-0.000159 (0.00219)	-0.000697 (0.000631)
Informal transfers	0.00160 (0.00324)	-0.174 (0.162)	0.000148 (0.0201)	0.00435 (0.00578)
Participation in associations	0.0168 (0.0253)	0.756 (1.272)	0.231 (0.157)	-0.0531 (0.0452)
Participation in training	0.0637** (0.0283)	5.166*** (1.422)	0.575*** (0.176)	0.0570 (0.0506)

	Shannon index	FCS	HDDS	Food consumption (log)
Dependency ratio	0.0933* (0.0517)	-2.648 (2.594)	0.0981 (0.320)	0.783*** (0.0923)
CSI	0.00206*** (0.000503)	0.0899*** (0.0253)	0.00707** (0.00313)	-0.00123 (0.000908)
Income sources activities	0.0375*** (0.0129)	1.695*** (0.646)	0.327*** (0.0797)	-0.0110 (0.0230)
No. crops cultivated	0.0357*** (0.00765)	1.392*** (0.384)	0.196*** (0.0474)	0.0572*** (0.0136)
Shock in the last 12 months				
Drought	-0.00695 (0.0272)	-2.084 (1.366)	0.142 (0.169)	-0.0391 (0.0486)
Flood	-0.0333 (0.0810)	0.0894 (4.068)	0.259 (0.502)	0.0882 (0.145)
Water shortage	0.0222 (0.0286)	2.973** (1.434)	0.162 (0.177)	-0.0149 (0.0510)
Crop pests and diseases	-0.00922 (0.0302)	0.277 (1.518)	0.0908 (0.187)	0.0675 (0.0540)
Livestock diseases	0.0437 (0.0439)	0.686 (2.205)	0.00605 (0.272)	0.158** (0.0784)
High cost of agricultural inputs	0.104 (0.0652)	4.152 (3.272)	1.057*** (0.404)	0.154 (0.116)
Illness of income earner	-0.0117 (0.0468)	0.188 (2.349)	0.311 (0.290)	-0.0804 (0.0836)
Illness of other members	-0.104*** (0.0360)	-6.849*** (1.807)	-0.422* (0.223)	-0.142** (0.0643)
Death of household members	-0.120 (0.0771)	-0.123 (3.868)	-0.0475 (0.478)	-0.0344 (0.138)
Theft of money, valuables and non-agricultural assets	-0.0395 (0.0444)	-1.574 (2.229)	-0.0101 (0.275)	-0.120 (0.0793)
Theft of agricultural assets or outputs	0.0266 (0.0373)	3.244* (1.872)	0.0834 (0.231)	0.0989 (0.0666)
Conflict	0.0564 (0.0583)	3.757 (2.929)	0.825** (0.362)	0.0156 (0.104)
Fire	0.179 (0.207)	-0.346 (10.41)	-0.533 (1.286)	0.425 (0.370)
Other shock	-0.00934 (0.0341)	-0.606 (1.712)	-0.0377 (0.211)	-0.0903 (0.0609)
Household characteristics				
Female household head	0.210 (0.289)	12.71 (14.50)	-0.187 (1.790)	0.457 (0.516)
Married household head	0.0243 (0.0426)	4.278** (2.137)	0.155 (0.264)	-0.220*** (0.0760)
De jure female head	-0.180 (0.292)	-10.70 (14.66)	0.391 (1.810)	-0.595 (0.522)
Hosting household	0.0701** (0.0354)	5.067*** (1.778)	0.0980 (0.219)	0.131** (0.0632)

	Shannon index	FCS	HDDS	Food consumption (log)
Agro-pastoralist	-0.161** (0.0667)	-5.397 (3.349)	-1.265*** (0.413)	-0.267** (0.119)
Farmer	-0.198*** (0.0625)	-8.511*** (3.137)	-1.444*** (0.387)	-0.240** (0.112)
Kyegegwa	0.0465 (0.0314)	-1.063 (1.575)	0.465** (0.194)	0.0384 (0.0560)
Constant	0.879*** (0.110)	37.23*** (5.499)	3.968*** (0.679)	2.448*** (0.196)
Observations	705	705	705	705
R-squared	0.311	0.365	0.393	0.275
District dummies included in the models. The excluded district dummy in this case is 'Kamwenge'. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Table A10. **Probit model of the determinants of livelihood changes: refugee population**

	Aspiration of working in the sales/shops sector	Aspiration of working in the productive sectors	Aspiration of working in the same sector of country of origin
Female	-0.163 (0.120)	0.167** (0.0840)	-0.0374 (0.0830)
Age	0.0324** (0.0153)	0.00355 (0.0101)	-0.0241** (0.0106)
Squared age	-0.000498** (0.000230)	-4.60e-05 (0.000137)	0.000233* (0.000141)
No. months lived in same area	0.000332** (0.000149)	-1.80e-06 (9.75e-05)	-0.000244** (0.000119)
Years of formal education	0.0191 (0.0257)	0.0709*** (0.0181)	-0.0602*** (0.0180)
Married	0.0528 (0.0399)	0.0314 (0.0276)	-0.0812*** (0.0276)
Literacy (local language)	-0.233 (0.185)	-0.285** (0.127)	0.303** (0.126)
Literacy (English)	0.144 (0.197)	-0.0557 (0.142)	-0.172 (0.140)
Kyegegwa	0.193 (0.124)	-0.0700 (0.0851)	-0.373*** (0.0847)
Constant	-2.120*** (0.345)	-0.788*** (0.236)	1.366*** (0.245)
Observations	996	996	996
The excluded district dummy is 'Kamwenge'. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1			

Table A11. **Summary of refugees working sectors**

Work in same sector	Freq.	Percent
0	384	38.55
1	612	61.45
Change to sales		
0	918	92.17
1	78	7.83
Change to production		
0	893	89.66
1	103	10.34

Table A12. **Training received by refugee and host community households**

	Refugee households		Host community households	
	N	Percent	N	Percent
Household that received training	106	27.0	46	15.0
Agricultural techniques	24	22.9	24	51.1
Livestock/livestock products	9	8.6	5	10.6
Health	10	9.5	6	12.8
Business skills /Entrepreneurship	59	56.2	22	46.8
Social/Vocational skills	20	19.0	6	12.8
Other	6	5.7	0	0.0

Table A13. **Household duration in Kyaka II and Rwamwanja**

HH duration in Southwest settlements (months)	No. of refugee households	RCI
0 - 36	113	35.67
37 - 72	163	39.31
73 - 108	30	44.54
109 - 144	39	47.47
145 -180	33	49.58
>180	17	39.16

Table A14. **Economic sectors refugees aspiring to work**

Economic sector in country of origin	Main economic sector would like to work in the future								
	Not applicable	Agriculture, hunting	Fishing	Mining and quarrying	Manufacturing	Energy: electricity	Construction	Sale, maintenance	Hotels and restaurant
Not applicable	115	45	1	2	5	1	15	34	6
Agriculture, hunting	11	372	5	0	1	1	2	33	7
Fishing	0	2	2	0	0	0	0	0	0
Mining and quarrying	0	1	0	2	0	0	0	3	0
Manufacturing	0	0	0	0	3	0	0	0	0
Construction	0	0	0	0	0	0	9	1	0
Sale, maintenance	0	1	0	0	0	0	1	25	0
Hotels and restaurant	0	0	0	1	0	0	0	0	4
Transport, storage	0	0	0	0	0	0	0	2	1
Real estate, renting	0	1	0	0	0	0	0	0	0
Public administration	0	3	0	0	0	0	0	0	0
Education	0	5	0	0	1	0	0	1	0
Health and social work	0	2	0	0	0	0	0	0	0
Other community, social work	0	3	0	0	0	0	0	2	0
Private households	0	0	0	0	0	0	0	0	0
Other (specify)	1	3	0	0	0	0	1	2	0

Economic sector in country of origin	Main economic sector would like to work in the future									
	Transport, storage	Financial	Real estate, renting	Public administration	Education	Health and social work	Other community, social work	Private households	Extra-territorial organization	Sale, maintenance
Not applicable	14	7	37	10	19	24	6	4	1	34
Agriculture, hunting	7	0	12	0	4	2	5	0	0	33
Fishing	1	0	0	0	1	1	0	0	0	0
Mining and quarrying	0	0	0	0	0	0	0	0	0	3
Manufacturing	0	0	0	0	0	0	0	0	0	0
Construction	0	0	0	0	0	0	0	0	0	1
Sale, maintenance	0	0	0	1	0	0	0	0	0	25
Hotels and restaurant	0	0	0	0	0	0	0	0	0	0
Transport, storage	8	1	0	0	0	0	0	0	0	2
Real estate, renting	0	0	32	0	0	0	0	0	0	0
Public administration	1	0	0	0	0	0	0	0	0	0
Education	0	0	2	0	15	0	0	0	0	1
Health and social work	0	0	0	0	0	11	1	0	0	0
Other community, social work	0	0	0	0	0	0	8	0	0	2
Private households	0	0	0	0	0	0	0	1	0	0
Other (specify)	0	0	2	1	4	3	1	0	0	2


© FAO / Isaac Kasamani

This report is part of a series of country level analysis prepared by the FAO Resilience Analysis and Policies (RAP) team. The series aims at providing programming and policy guidance to policy makers, practitioners, UN agencies, NGOs and other stakeholders by identifying the key factors that contribute to the resilience of households in food insecure countries and regions.

The analysis is largely based on the use of the FAO Resilience Index Measurement and Analysis (RIMA) tool.

The Food and Agriculture Organization of the United Nations (FAO) would like to thank the collaboration through the Resilience Measurement Unit (RMU), with the United Nations Children's Fund (UNICEF), the World Food Programme (WFP) and the Uganda Bureau of Statistics (UBOS), under the leadership of the Office of the Prime Minister of Uganda (OPM) and with the technical support of the Intergovernmental Authority on Development/Resilience Analysis Unit (IGAD/RAU).

This publication has been produced with the financial support of the European Union. The contents of this publication are the sole responsibility of FAO and can in no way be taken to reflect the views of the European Union.

Contacts
Luca Russo, Senior Economist
Food and Agriculture Organization of the United Nations
luca.russo@fao.org

Marco d'Errico, Economist
Food and Agriculture Organization of the United Nations
marco.derrico@fao.org

CA6032EN/1/09.19