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Contribution of Agriculture in the Enhancement of Refugees Livelihoods in Nakivale Settlement

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Abstract

Uganda has significantly continued to receive a large number of refugees in the region and this is positively correlated with its proportional increase in peace and stability. The presence of favorable climatic conditions enhances agricultural productivity and this has triggered redirecting refugees into agricultural production as the major source of livelihood. However, in Ugandan setting, it has not yet been clearly established how agriculture has practically enhanced the livelihoods of the refugees. The study therefore aimed at identifying the agricultural activities practiced by refugees living in Nakivale refugee settlement, identifying the challenges faced by refugees involved in agriculture and their possible solutions as well as examining the contribution of agriculture towards livelihoods of refugees in Nakivale Refugee settlement. The study utilized a case-study approach to analyze the contribution of agriculture in the enhancement of livelihoods in the context of a single settlement and a sample size of 80 respondents was chosen using simple random sampling and an interview guide was used to collect primary data from the respondents. It was revealed from the study that crop production is the main agricultural activity practiced by refugees living in Nakivale refugee settlement in a bid to improve on their food security and household incomes. The study further revealed that climate change, diseases/parasites and diseases, limited land and low prices for the produce are the most serious challenges facing refugees' farmers. It is concluded that food security in Nakivale refugee settlement is rather influenced by agricultural production and the associated dynamics that ultimately determine the well-being of the refugee communities. It is important to appreciate that any variation in factors of production, weather and produce prices will determine livelihood status of the community for such a specific period of time. It's recommended that farmers should adopt climate smart farming to mitigate effects of climate change, supporting

farmers with agricultural credit and other agricultural inputs like fertilizers, pesticides, farming tools, land, farmers training, improved seeds which are high yielding and quick maturing, market linkages for improved productivity and production.

Keywords

Agriculture, Enhancement, Refugees Livelihoods

1. Introduction

Uganda is one of the African countries hosting a large number of refugees especially from the countries in the region and this is attributed to its peace and stability for past two decades [1]. Presently, Uganda hosts more than one million refugees and is ranked number three hosting country in the world after Pakistan and Turkey. The refugees in Uganda are from multiple countries in Africa like DRC, Somalia, Rwanda, Burundi, Ethiopia, Southern Sudan and Eritrea and are being hosted in Thirty (30) different refugee settlements and camps across the country.

Uganda has been hyped for having one of the most liberal and progressive refugee-hosting policies in the world. The Ugandan setting is different from other host countries by that fact that while refugees are still initially placed in settlements, they have the right to free movement and employment within the country. The refugee children get access to preschool and primary education comparable to that of the nationals. Within the settlements, the UNHCR collaborates with the local government to provide both public service facilities (clinics, boreholes, etc.) and plots of land for homesteading at the time of registration. In some settlements, refugees are allocated agricultural plots on which they can grow crops [2]. Access to cultivable land helps provide a means of self-sustainability within the settlement and potentially fosters two-way produce trade between refugees and locals. The WFP provides food or cash aid to the refugees in Uganda as in other refugee-hosting nations. Between the provision of agricultural land, relief aid and freedom of movement, there exist plenty of opportunities for refugees to interact economically with host-country businesses and households around the settlements refugee.

One of the key tenets of Ugandan refugee policy [2] is self-reliance strategy, a policy that expects refugees to economically support themselves by utilizing a given plot of land to develop a livelihood based on subsistence agriculture [3]. Although many have hailed this policy as being progressive and beneficial for the refugees, others have pointed out the flaws and deficiencies in the policy and in its implementation. With a growing influx of refugees in Uganda (Approximately 1.5 million refugees), making it the largest refugee hosting country in Africa and the third in the world, the refugees livelihoods in terms of food security, household income levels, health, nutrition are very low and thus promoting sus-

tainable food production and resilient livelihoods is critical for the wellbeing of refugees to reduce their dependence on humanitarian aid in form of food rations and non-food items and to improve on their livelihoods.

There is a low resilience among refugee households linked but not limited to limited access to physical productive assets, limited agricultural extension services, shortages of agro-inputs, gender roles and inequalities [4]. Refuges own less agricultural assets (livestock and land) and produce a smaller range of different crops which result in high levels of food insecurity. The adoption of negative coping strategies to deal with food shortages, and persistent and high dependency on humanitarian assistance to meet basic needs are some of the already documented key issues. Substantial transfers, both in cash and in kind, do not compensate for the lack of inputs and limited agro-production [4]. Therefore, there are few studies that have clearly documented on the contribution of agriculture on the livelihoods of the refugees in the settlements, and it's against this background that the current study is geared towards ascertaining the contribution of agriculture in enhancement of livelihoods in Nakivale refugee settlement.

The findings from this study will be of great significance in the world of academia as it will help in bridging the research gaps left by previous scholars who conducted studies on a related subject. In addition, future scholars who may wish to conduct further studies, may use it as a point of reference.

Furthermore, the findings of this study can be used as inputs for decision-making by the policy makers, planners, non-governmental organizations, and implementers of refugee policies. Following the findings of this study can expose some areas which need improvement as far as agriculture as livelihood strategy in refugee settlement is concerned.

In addition, the findings can provide additional knowledge on the present literature on the contribution of agriculture in the enhancement of livelihoods in refugee camps. It is anticipated further that the study can also stimulate interest on more researches in the field of livelihood enhancement in refugee settlements.

2. Problem Statement

Most refugee situations in Uganda are not resolved quickly. Instead, they become protracted, stretching over years or even decades, often without a clear end in sight. One of the major difficulties UNHCR and other aid agencies face in prolonged displacement is diminished donor interest in supporting these long-term refugees [5]. Because of this, it has become more important than ever to find ways to better integrate refugees into countries of first asylum, particularly by ensuring they have access to livelihoods and economic opportunities. For aid agencies, helping refugees become economically self-sufficient holds the promise of reducing mounting costs particularly in a time of dwindling budgets and of helping refugees find long-term solutions to their displacement.

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There is a low resilience among refugee households linked but not limited to limited access to physical productive assets, limited agricultural extension services, shortages of agro-inputs, gender roles and inequalities [4]. Refuges own less agricultural assets (livestock and land) and produce a smaller range of different crops which result in high levels of food insecurity. The adoption of negative coping strategies to deal with food shortages, and persistent and high dependency on humanitarian assistance to meet basic needs are some of the already documented key issues. Substantial transfers, both in cash and in kind, do not compensate for the lack of inputs and limited agro-production [4]. Therefore, there are few studies that have clearly documented on the contribution of agriculture on the livelihoods of the refugees in the settlements, and it's against this background that the current study is geared towards ascertaining the contribution of agriculture in enhancement of livelihoods in Nakivale refugee settlement.

3. Materials and Methods

The study was carried out in Nakivale Refugee settlement located in Isingiro district, Western Uganda. Nakivale is one of the oldest refugee settlements in Uganda and was opened in 1958 and officially established as a settlement in 1960.The Settlement hosts approximately 150,000 refugees from Burundi, Democratic Republic of Congo, Eritrea, Ethiopia, Rwanda, Somalia, Sudan and Southern Sudan. During the Burundian Crisis in 2015, the Population of the settlement greatly increased. The refugee settlement has a total area of 185 kmsq (71 sq mi). This settlement was chosen because it is one of the oldest settlements in Uganda and subsequently has especially well-established organizations and refugee assistance infrastructure.

Research Design.

The study utilized a case-study approach to analyse the contribution of agriculture in the enhancement of livelihoods in the context of a single settlement. The case-study approach was used because it allowed the study to not only gain an in-depth understanding of the issues in the settlement, but also helped the research to offer lessons for broader self-reliance refugee policy. The design util-

ized a mixed study approach with both quantitative and qualitative approaches of data collection and analysis. Mixed methods were intended to minimize the limitations of using one paradigm.

Sampling technique

The sample population for this study was both refugees in the settlement and settlement administrators and NGOs employees working in the settlement. Household respondents *i.e.*, the Refugees were randomly selected from the lists of refugees obtained from the office of the Settlement Commandant. Key informants *i.e.*, the Settlement administrators and NGOs employees were purposefully selected to give expert advice regarding the contribution of agriculture on the livelihoods of refugees in Nakivale Refugee Settlement.

Sample Size

The sample size of the household respondents was calculated using Krejcie and Morgan table (1970) formula. The formula states that $S = X^2NP(1-P)/\left[d^2(N-1)+X^2P(1-P)\right]$. Therefore, considering the population of 100 households, a sample size of 80 respondents was reached at using the Krejcie & Morgan table formula out of the targeted 100 households.

In addition, for qualitative data, 10 key informants who included 1 settlement commandant, 3 livelihoods officers, 3 extensions workers and 3 sub zone commandants were considered following the purposive sampling technique.

Formula used to determine sample size

$$\text{Sample Size} = X^2NP(1-P)/\left[d^2(N-1)+X^2P(1-P)\right]$$

where X^2 is the Chi Square value corresponding to 95% confidence interval (3.8416).

N is the population size (100).

P is the population proportion (0.50).

d^2 is the margin of error (0.05) at 95% confidence level

$$S = 3.8416\times100\times0.5\times0.5/\left[0.05^2(100-1)+3.8416\times0.5\times0.5\right]$$

$$S = 96.04/(0.2475+0.9604)$$

$$S = 96.04/1.2079$$

$$S = 79.5099 \approx 80$$

Data Collection Tools

Both qualitative and quantitative approaches were employed due to the nature of the study. The qualitative approach enabled the researcher to make an in-depth investigation.

Data Analysis

Data collected through interviews was coded and entered into the Statistical Package for Social Sciences (SPSS). For objectives all the three objectives, descriptive statistics were summarized into tables showing percentages and frequencies of the respondents. Qualitative data was analysed using thematic and narrative analyses. With thematic content analysis, themes were developed basing on objectives of the study and the data collected for systematic flow of the

report. With narrative analysis, the researcher used verbatim quotes to express respondents' views as supported by Hsieh (2005) who asserts that narrative analysis best brings out the views of the respondents.

Ethical considerations

The researcher got an approval from the Directorate of Graduate Studies, Research and Innovations to ensure that the ethical guidelines were followed throughout the data collection process. At the onset of data collection, the researcher got permission from the Refugee Desk Officer (RDO) to allow him conduct the study in the area. The researcher employed ethical approaches, which are documented by Lichtman (2013) as a guideline. The objectives of this study were explained to all participating farmers who participated in the survey and interviews. The researcher developed a rapport with respondents, which provided an environment that made participants disclose the necessary information. All the possible personal information during the research were kept confidential, and informed consent was ensured by asking orally the farmers, model farmers, and key informants about their willingness to participate in the research. The acceptance to participate in the study was expressed verbally by all respondents

4. Results

The study used two types of data analysis; namely descriptive analysis and inferential analysis. The descriptive analysis dealt with demographic characteristics of the respondents, agricultural activities carried out by the refugees, challenges encountered while carrying out these activities as well as solutions to the challenges. For the inferential analysis, the study used the Pearson correlation to measure the degree of association between agriculture and food security of refugees. Qualitative was presented alongside quantitative findings sincere it uncovered data that was not covered quantitatively. This chapter also deals with demographic characteristics of the respondents from the study.

4.1. Demographic Characteristics of Respondents

Demographic characteristics of respondents were considered in this study to ascertain whether respondents were fairly selected to participate in this study. These included gender, household status, age, marital status, duration in the settlement, country of origin and number of household members. Study findings from Table 1 shows that the majority of the respondents (53%) were females whereas the minority (47%) were males. The slight difference in numbers is an indication that both sexes were equally represented in this study, however, females are more engaged in agricultural activities than males in the refugee settlement.

It was further found that the majority of the participants (41.3%) were children followed by family heads (36.3%) and the least were the spouses of the household heads *i.e.*, 22.5%. As far age is concerned, it was found out that majority of

Table 1. Demographic characteristics of the respondents.

Variable	Frequency (N = 80)	Percentage (%)
Gender		
Male	38	47
Female	42	53
Respondent's status		
Head	29	36.25
Spouse	18	22.5
Child	33	41.25
Age group		
11 - 20	9	11.25
21 - 30	22	27.5
31 - 40	24	30
41 - 50	13	16.25
51 - 60	7	8.75
Above 60	5	6.25
Marital status		
Single	16	20
Married	41	51.25
Divorced	5	6.25
Widowed	18	22.5
Duration in settlement		
1 - 5 years	26	32.5
6 - 10 years	23	28.75
11 - 15 years	24	30
16 - 20 years	7	8.75
Country of origin		
DRC	32	40
Burundi	21	26.2
Rwanda	25	31.2
Somalia	2	2.5
Household size		
1 - 4 members	46	57.5
4 - 6 members	27	33.75
Above 6 members	7	8.75

the respondents (30%) belonged to age group of 31 - 40 years, followed by 27.5% who belonged to age group 21 - 30 years whereas the least (6.25%) were 60 years and above which is an indication that most of the refugees in Nakivale settlement are young.

The majority of the respondents 41.25% were married and the least (5%) were divorced. In terms of time spent in the settlement, majority of the respondents (32.5%) had spent in the settlement for a period of between 1 - 5 years, followed by (30%) of the respondents who had spent a period of between 11 - 15 years whereas the least (8.75%) have been in the settlement for a period of between 16 - 20 years. Regarding the country of origin, majority of the participants *i.e.*, 40% were from DRC, followed by 31.2% who were from Rwanda whereas the least (2.5%) were from Somalia. The majority of the households *i.e.*, 57.5% had between 1 - 4 members, followed by 33.8% of the households that constituted between 4 - 6 members, and the least were households constituting above 6 members at 8.8%.

4.2. Agricultural Activities Carried out by Refugees in Nakivale Refugee Settlement

In this section, the researcher asked the respondents about the agricultural activities that they were involved in at Nakivale Refugee Settlement. The details are presented in Table 2.

Findings from Table 2 reveal that the majority of the participants (42.5%) were involved in crop production, 28.8% in poultry, 21.2% were in livestock, 5% in produce shops and only 2.5% were having agro-input shops. Based on these results, it is clear that majority of the respondents (92.5%) are directly involved in agriculture activities *i.e.*, crop production, livestock and poultry. Also, the remaining 7.5% of the respondents are indirectly involved in agriculture selling agro-inputs (2.5%) and agricultural produce *i.e.*, 5%. This points to the importance of agriculture to these refugees.

In connection to the above, a number of key informants said that:

> "Our country's policy on refugees is different from other countries, Refugees are offered a plot of land to practice agriculture to promote self-reliance and economic well-being. As you have seen, they are involved in crop cultivation and livestock rearing from where you have moved …" (Settlement Administrator, Base Camp Zone)

Table 2. Agricultural activities carried out by refugees.

Activities	Frequency (N = 80)	Percentage (%)
Crop production	34	42.5
Poultry	23	28.8
Livestock	17	21.2
Produce shop	04	5.00
Agro-input shop	02	2.50

"Our refugees derive much of their livelihood in agriculture and that is why donor agencies invest a big investment in the sector because it provides food but also income to the refugees" (NGO, Livelihood Officer, Rubondo Zone).

"Involvement of refugees in farming has been of great importance in changing their lives. After selling their produce and livestock, they use the proceeds to buy household items and improve their housing conditions. The general status of refugees who are involved in agriculture is okay compared to those who are not involved …" (NGO Staff, Juru Zone)

In addition to the above, one respondent stated that;

"Since the intervention of refugee agencies like UNCHR, my agriculture farming business has improved as we are given free inputs like seeds and fertilizers. This has also improved the livelihoods of my children." (Refugee Farmer, Juru Zone)

Basing on the above attestations from key informants and the refugee respondent, it is very clear and evident that the refugees are supported by the different organizations to carry out the agricultural activities to improve their livelihoods, to stop or reduce reliance on food assistance from World Food Programme and other partner organizations operating in the refugee settlement.

4.3. Challenges Faced in by Refugees in Carrying out Agricultural Activities

The respondents were asked to state the challenges they face in carrying out their agriculture activities in Nakivale Refugee Settlement. The details are presented in Table 3.

Results in Table 3 reveal that the majority of the respondents *i.e.*, 22.5% reported harsh climate, followed by pests and diseases (17.5%); then low prices for agricultural produce (15%); destruction of crops by livestock (13.8%); lack of agro-inputs (11.3%); the land being not enough was reported by 12.5% of the respondents while only 7.5% reported soil infertility as another challenge facing farming.

Table 3. Challenges faced in by refugees in carrying out agricultural activities.

Challenges	Frequency (N = 80)	Percentage (%)
Harsh climate	18	22.5
Pests and diseases	14	17.5
Low prices for the agricultural produce	12	15,0
Livestock destroying crops	11	13.8
Lack of enough land	10	12.5
Lack of agro-inputs	09	11.3
Soil infertility	06	7.50

In connection and agreement to the above results, a number of key informants said that:

> "Farmers in this settlement are facing a lot of challenges including harsh climate. Isingiro experiences a long dry spell which makes it difficult for both crop farmers and those in livestock to prosper in farming. Besides, farming is largely subsistence with rudimentary tools which compromises production …" (Settlement Administrator, Juru Zone)
> "The major problem here in the camp is lack of enough arable land for the refugees, we only allocate them small plots of land and this limits them to subsistence farming hence a challenge to agriculture in this camp." (NGO Livelihood Officer, Rubondo Zone)
> "The fact that the refugee camp is located in the dry corridor area, the weather is harsh and this does not favour agriculture activities among the refugee community thus lowering production and impacting on production and availability." (Extension Worker, Base Camp Zone)
> "Some of the refugees normally consume the planting materials like seeds instead of planting them for future harvests. Worse still some of them even sell to the host communities for petty cash and this is also a challenge facing agriculture in the settlement." (NGO Livelihood Officer, Juru Zone)
> "This settlement has a big population and we cannot support every one with agricultural inputs to improve on their production, currently we are only supporting new arrivals with vegetable seeds to do kitchen gardening." (Extension worker, Rubondo Zone)

These results imply that agricultural activities in the refugee settlement, like any other farming community, is faced with a variety of challenges that have both direct and indirect impact on output and income, all of which affect the livelihoods of these farming communities in the settlement.

4.4. Suggested Solutions to the Challenges Facing Agriculture

The respondents were asked to suggest possible solutions to the challenges faced in their agricultural activities in Nakivale Refugee settlement. The details are shown in Table 4.

Table 4. Suggested solutions to the challenges facing agriculture.

Solution	Frequency (N = 80)	Percentage (%)
Provision of farming inputs	22	27.5
Provision of extension services	17	21.3
Financial assistance	14	17.5
Offering more land	12	15.0
Proper storage	06	7.50
Diversification of farming	05	6.30
Investing in value chain management	04	5.00

Majority of the respondents (27.5%) identified provision of agricultural inputs as the remedy to their farming challenges. This was followed by provision of extension services (22.3%); financial assistance (17.5%); allocating of more land (15%); proper storage facilities (7.5%); diversification of farming activities being identified by 6.3% and the least solution being investing in value chain management, identified by only 5% of the respondents.

In connection to the above results, a number of key informants said that:

> "Farming in this settlement can be improved by offering training services to farmers on climate smart agriculture. This can be possible through extension services by experts …" (NGO Staff, Rubondo Zone)
>
> "Farmers among refugee communities can be supported with agricultural inputs such as improved seed varieties, fertilizers, pesticides and storage facilities. This will improve agricultural productivity and minimize post-harvest losses …" (Settlement Administrator, Base Camp Zone)
>
> "There is need to employ more extension workers to be able to cover the refugee population because current the existing extension are few compared to the number of refugees requiring their services." (Commandant, Juru Zone)
>
> "If government and development partners operating in the camp would provide more financial assistance to enable the refugee farmers to buy agro inputs like fertilisers to improve soil fertility as part of the arable land is currently exhausted. This would enhance on production and hence adequate food security among the refugee population." (NGO Livelihood Officer, Base Camp Zone)
>
> "There was a need to increase on arable land because refugees keep coming in yet land has remained the same over the years. This limits the size of land allocated for agriculture and ultimately lowers production causing permanent food insecurity in the settlement." (NGO Livelihood Officer, Rubondo zone)

These attestations imply that there are a variety of possible solutions to the challenges faced by the refugees in carrying out their agricultural activities, when collective actions are undertaken by the different actors in the refugee settlement.

4.5. Contribution of Agriculture towards the Refugee Livelihoods

The respondents were asked the contribution of agriculture towards their livelihoods in terms of household incomes and food security and the results are presented in Table 5.

Table 5 reveals that majority of the respondents (82.5%) earn less than UGX. 500,000/ = per season from all their agriculture produce, leaving a small number of the respondents that earn more than half a million and above a million *i.e.*, 6.3% and 5% respectively. In connection to the above results, a number of key informants said that:

Table 5. Contribution of agriculture towards the refugee livelihoods.

Variable	Frequency (N = 80)	Percent (%)
Seasonal agricultural sales (UGX)		
0 - 500,000	71	88.75
500,001 - 1,000,000	5	6.25
Above 1,000,000	4	5
Monthly household income		
0 - 50,000	25	31.5
50,001 - 100,000	22	27.5
100,001 - 200,000	23	28.75
200,001 - 300,000	7	8.75
Above 300,000	3	3.75
Duration of food storage (Months)		
0 month	10	12.5
1 - 2 months	34	42.5
3 - 4 months	33	41.25
>5 months	3	3.75
Daily food consumption		
One meal	8	10
Two meals	59	73.75
Three meals	13	16.25
Food types consumed		
Grains and cereals	80	100
Vegetables	67	83.75
Legumes	76	95
Meat	28	35
Root tubers	66	82.5
Fruits	47	58.75
Clothing status		
Very good	7	8.75
Good	38	47.5
Fair	29	36.25
Poor	6	7.5
Type of Shelter		
Grass thatched house	5	6.25
Tarpaulin roofed house	33	41.25

Continued

Iron sheets roofed house	42	52.5
Household belongings		
Poultry and Livestock	62	77.5
Farming tools	60	75
Solar electricity	42	52.5
Mattresses	50	62.5
Mobile phone	61	76.25
Bicycle	40	50
Radio	35	43.75

"I believe that without agriculture projects in this settlement, many of the refuge lives would be bad but thanks to the presence of the projects. Refugees can get food and little surplus for sell as a means of getting an income to purchase of other household needs." (Extension work, Base Camp Zone)

Most of households (87.7%) earn between UGX. 50,000 to 200,000/ = monthly. Only 12.3% are able to earn more than 200,000 shillings in a month. Considering an average household size of 4 - 6 members, this income is not enough to meet all their basic requirements.

The harvested food is not consumed or sold at once, instead some is stored to be used at a later time. A big percentage (87.5%) of respondents said that they store food after harvesting as a food security strategy. However, only 4.3% stored food for more than five months.

Food consumption is the strong indicator of the state of food security of the household. The study reveals that majority of household (74%) have two meals a day that is lunch & supper, 10% having one meal a day and only 16% reported having three meals in a day. In connection to the above results, a number of key informants said that:

"Agriculture plays a big role in supplementing our agency mission of ensuring that the refugees get adequate food stuffs so as to avoid malnutrition especially among the children and diseases resulting from poor feeding." (NGO livelihood Officer, Juru Zone)

"I appreciate the efforts of the NGOs and government of Uganda in supporting agriculture in this settlement, Refugees are able to get food for their children, and I really appreciate on their behalf." (Settlement Commandant, Rubondo Zone)

Access to different types of foods is a strong indicator of the state nutrition of the households. The study findings reveal that Grains and cereals (maize, sorghum and rice) were consumed by all the respondents (households) *i.e.*, 100%. Legumes (*i.e.*, beans, peas and groundnuts) came in the second position with 95% of the respondents, followed by vegetable (Amaranthus, cabbage, Suku-

mawiki and spinach) at 83.75%; Root tubers (cassava and sweet potatoes) at 82.5%; fruits (bananas, mangoes, avocado, pumpkins, water melon) at 58.8% and meat (fish, chicken and beef) was least consumed, with only 35% of the respondents eating it in the last 30 days. Rice, maize and beans are distributed to the refugees by WFP on monthly basis.

The study revealed the clothing status of the respondents to be good and fair at 47.5% and 36.2% respectively. Less than 10% responded with very good (*i.e.*, 8.8%) and poor dressing (7.5%) in the settlement.

More than half of the households *i.e.*, 52.5% have iron sheet roofed houses but also there is equally high percentage (41.3%) of households with tarpaulin roofed houses, with 6% of the households staying in grass thatched houses. The nature of the household shelter is the function of many factors such as ability to generate money from different sources, time spent in the camp, the economic status at arrival and others. Having iron sheet roofed houses is associated with serious involvement in agriculture.

For the household belongings, most have mobile phones (76.3%) and farming tools (75%) than other items. Other items owned by more than 50% of the respondents include; solar, mattresses, bicycle and others.

5. Discussions

5.1. Demographic Characteristics of the Respondents

The findings of the study pointing to most of the respondents being young are not surprising for Nakivale refugee camp in Uganda. This is because similar findings were also reported by [6] who found that the population in refugee camps is usually dominated by the youth, with reduced number of infants and older ones. This could be as a result of low fertility rate that is attributed to high levels of stress and poor nutritional status. These factors have also been associated with high infant mortality rate as well as the death of elderly, leaving the population dominated by the young adults [7].

For the household size, the findings of this study concur with those of UNHCR and World Vision report (2017) which revealed that 45% of the refugee households in Northern Uganda had 6 - 10 members. Household size has a significant impact on the household food consumption, expenditure and income and thereby affecting the livelihood of the refugees. The more the number of household members, the higher the food expenditure which significantly affects the livelihood of the refugee communities.

5.2. Agricultural Activities Refugees Participate in at Nakivale Refugee Settlement

Refugee communities are usually involved in activities that earn them a living [8] in addition to the support by the humanitarian organisations [9] [10] [11]. The findings show that refugees in Nakivale settlement are involved in various livelihood activities, however these activities are nationality specific. Farming has

highly been recommended by both national and international bodies as the most important livelihood activity for the refugees [12]. Similarly, farming is mostly done by refugees in Nakivale to earn a living and relevant knowledge regarding climate smart agriculture is being instilled in the community.

Crop production is the favourite agricultural venture for refugees because it does not require huge initial capital to begin compared to other ventures. Also, it could be that refugees prefer agriculture because that's what they have always done, even when they had not become refugee *i.e.*, agriculture has been the source of their grand and grandparents and therefore their long-time source of livelihoods. However, most of the agriculture produced is subsistence, and food produced is consumed and very few sold to the surrounding urban centres [13]. The same thing is happening in Nakivale refugee camp where most crops produced such as maize and beans are almost consumed by the households.

Poultry production is very for some groups of people because it requires less land as evidenced by the study conducted by [14] and this partly solves the challenge of limited land. Despite the scarcity of land, a significant number of households keep livestock but in minimal numbers for nutritional security. These animals can effectively help in making use of crop residues as animal feed, hence enterprise complementarity [15].

Refugees usually get 50 m × 50 m plot of land for cultivation allocated to them by Office of the Prime Minister (OPM), overtime the size of the plots have been reduced due to declining availability of land [13] [16]. Refugees consider the time they are likely to spend in the host country and they are reluctant at planning big investments and end up operating agriculture on small scale. Others are involved in other livelihood activities and they do farm to supplement their primary sources of income. This information is helpful especially when planning for an appropriate agricultural intervention for the refugees. Kitchen gardening [17] will be more ideal for refugees owning less than an acre and planting of high value crops by households farming on one acre and below.

5.3. Challenges Faced in Farming and the Suggested Solutions

Farmers face many challenges in their farming activities but it becomes worth when it comes to the refugees due to limited capacity to absorb the shock. Climate change, diseases, limited land and low prices for the produce are the most serious challenges facing refugees like other farmers [18] [19]. These challenges drastically reduce the quantity and quality both in crop and livestock production hence affecting household income levels and ultimately negatively affecting socio-economic status of the refugees. The adoption of up-to-date agricultural technologies such as irrigation guarantees increased production but affordability dictates. This forces refugee farmers to continue operating traditionally since they cannot afford.

Most of the responses given by the refugees concerning solutions to the challenges were based on physical assistance especially getting more land, accessibil-

ity to agricultural inputs, improved seeds and farmer trainings through extension services. This is due to the fact that most supportive organisations come with handouts and this interferes with sustainability. Farmer trainings is the most interesting suggestion from the respondents because it enhances sustainability [20]. Some of the suggestions such as acquiring more land may not be relevant here due to the fact that even if it is a half-acre, provided good agronomic practices are employed, production can increase. Generally, once all these suggestions are viewed from a wider angle and the heavier one prioritised and effected, agriculture can be more meaningful to the socio-economic status and livelihood of refugees.

5.4. Contribution of Agriculture towards Refugees' Livelihoods

Agriculture is central to the livelihoods of the refugees in Nakivale refugee settlement. This less earning from agricultural produce could be attributed to the fact that most of these refugee farmers practice subsistence farming where most of the food is for consumption purposes and less is put to market to earn some income for procurement of other basic needs. In addition, it could also be attributed to the low market prices for the agricultural produce and low harvests as a results of climate change effects *i.e.*, prolonged drought and unreliable rainfall. This is consisted with the finding of [21], who attributed poor harvests to unfavourable weather patterns. More so, some of the refugees are reluctant due to the fact that they are sometimes given free food, so they are not willing to actively participate in agricultural production. A small proportion of refugees, who have been in the camp for quiet long time, are assumed to have stabilised and they are able to produce enough for consumption and storage for long time. Those households that make more sales from agriculture are likely to be operating on large scale, producing good quality produce and also using the appropriate agricultural technologies. Adapting and use of climate smart agriculture practices can increase quantity and quality of agricultural produce in any area [22].

It is not surprising for the study findings to reveal a low monthly household income. This is because the households in a refugee camp is allocated a small land where few activities are carried out, denying them chances of enjoying economies of scale in their activities and hence less income generation from these activities. Also, with less diversification, which is practiced would increase income through earning from different sources [23], less income inflow is expected. This is because diversification is one of the climate change adaptation measures especially in farming communities [24].

Although refugees in Nakivale are given land and mobility rights, their food security remains relatively low, with a high dependency on food aid and this is in agreement with UNHCR and world vision (2017) report which revealed that 58% of refugees in northern Uganda entirely rely on food assistance for survival. A study conducted by [16] confirms that refugees go out to purchase the food to

supplement on what is offered to them or what they have produced.

The households storing food for not more than 5 moths could be associated with lack of storage facilities, which is in turn due to lack of capital for procuring or putting up storage facilities. This is very true and important finding because it is not usually easy to produce enough to eat and store in a refugee camp primarily due the small portions of land the households own as well as the high number of children [25]. This has a serious impact on food availability and accessibility. This has an impact on food security since harvested produce needs handled with care to avoid post-harvest losses [26] and to increase the storability and as well as the value of the produce.

Nutritional status in refugee camps is usually questionable because of the low nutritive value food items distributed by responsible UN organisations [27]. These findings instead confirm that the nutritional status of the refugees in this camp is good due to the diversity of food taken which is essentially attributed to agricultural activities in the camp. It is clear that refugees in Nakivale settlement do not rely on what is supplied to them by friends of good will and humanitarian organization but produce themselves [13]. It should be noted that having a diversity of food types may not directly translate to food security but also how this food is utilized.

The refugees in Nakivale settlement like other refugees and citizens in other part of Uganda, need essential items to use in everyday life such as telephones, bicycles, radios and others. All these items cannot be possessed by all the households because the socio-economic status depends on the income level of each household [16]. The refugees with money usually buy these items by themselves. However, in cases where they find it difficult to have these items, humanitarian organisations do offer these non-food items such as mosquito nets, blankets, Jerrican and others to achieve to equity goal in the standards of living of refugees [28].

Findings revealed that there is a relationship between agricultural enhancement and refugee livelihoods in Nakivale refugee settlement. This is in agreement with [29] who mentioned that development actors and donor states support agricultural projects, including by promoting access to land, introducing new techniques that lead to more lucrative crops, and improving market linkages. The government of Uganda, along with its international partners, is now exploring larger-scale agricultural projects that are designed to benefit both refugees and host communities. Since the 1980s, the idea has been promoted of refugees becoming self-reliant especially through agriculture, a concept that is related to recent debates about resilience and is still used today. Uganda has largely embarked on emphasizing agriculture in refugee camps as the best way of ensuring self-reliance, indeed the refugees have managed to generate income and produced food for home consumption.

Current findings are also in line with [30] who indicated that a unique feature of Uganda's refugee support policy is that refugees are allotted homestead land

upon registering in the settlement. In addition, some settlements (Rwamwanja, Nakivale) are able to provide cultivatable land for agricultural activities. It has been revealed that refugees farm their land intensively; output per acre is significantly higher for refugees than for host-country farmers around the two settlements. This does not mean that refugees are more efficient than host-country farmers (we find evidence that the opposite is true). However, refugees devote considerably more labour to their plots than host-country farms do, and this results in larger harvests per each unit of land [13]. The increased income helps refugees effectively deal with other socio-economic aspects of life such as paying school fees to their children in good schools, getting good quality medical services and many others [13]. In Nakivale refuge settlement, agriculture was among other activities that can have a positive impact on the refugee livelihood.

In addition, current findings agree with the findings of [31] who asserted that production of different types of crops in refugee settlement has been recognised as a major tool in ensuring nutritional security. Home gardening provides a low-cost, sustainable strategy for increasing household food security through dietary diversity and the introduction of micro-nutrient rich foods. Gardening improves the direct access to food, and when it does not depend too heavily on imported and costly inputs, it increases the self-reliance of households. Vegetable plots in combination with animal husbandry provide supplementary foods with high nutritive values, including proteins and vitamins, which are especially important for vulnerable groups (malnourished children, pregnant and lactating woman, and sick people). In addition, excess produce can be easily marketed locally. The proposed activities in the project can be easily done by women and are an acceptable activity for women headed households. Gardening further creates self-employment opportunities and fosters women's empowerment.

Furthermore, findings are in line with [32] who studied that in Uganda's refugee camps, a variety of crops such as cereals, legumes and tuber crops are grown and these contain different nutrients necessary for good health of the refugees especially children. The farming projects for refugees are often centred at multiple goals including promoting self-reliance, food security and economic integration and this takes refugee settlements.

Findings are also supported by a study conducted by [33] which revealed that refugees participating in agricultural production get improved livelihood as well as contributing to the economic development of the host country. This lie in the fact that a lot can be produced not only to feed the refugees themselves but also feeding other non-refugee communities which may not be involved in producing cash crops [31]. In addition to this, surplus may as well be exported to the neighbouring countries and the host country earns foreign exchange [34].

6. Conclusions

In this study, it was concluded that crop production is the major agricultural livelihood activity practiced by the refugees living in Nakivale refugee settlement

and it has greatly contributed toward the enhancement of their livelihoods in terms of food security, nutrition and households' income. The produce harvested from small scale agriculture production improves the food security of refugees' households and they are able to earn income by selling the surplus to improve on their economic wellbeing and self-reliance.

It was concluded that climate change, diseases, limited land and low prices for the produce are the most serious challenges facing refugees' farmers in their pursuit of agriculture as their livelihood strategy. These challenges drastically reduce the quantity and quality both in crop and livestock production hence affecting household income levels and ultimately negatively affecting socio-economic status of the refugees.

It was also found out that there is a positive relationship between agriculture and food security in Nakivale Refugee settlement.

7. Recommendations

Based on the findings of this study, the following recommendations were suggested for improvement of agriculture in Nakivale refugee settlement as a way of enhancing refugees' livelihoods.

Most farmers in the settlement are practicing subsistence agriculture that is entirely rain fed. But with the recent impact of climate change, the rains are sporadic and unreliable, making crop farming risky venture. Therefore, Climate Smart Agriculture such as distribution of drought resistant and quick maturing varieties, irrigation systems, green house farming, agro-forestry among others, are much needed to provide sustainable solutions to effects of climate change.

Farmers sell their produce in their raw form, hence getting low prices for their produce. By organising refugee farmers in groups and supporting them in agriculture value addition activities like processing and linking them to potential markets will be a strategy for increasing farmers' incomes and access to food security.

Refugee farmers are supported with agriculture credit to finance their agricultural operations, fertilisers to improve soil fertility and pesticides and fungicides to control crop pests and diseases, for increased agricultural productivity and production. Also access to agriculture credit will help the farmers to acquire any kind of productive assets and it plays an inevitable role in agricultural productivity because it increases the quantity and quality of inputs used in agricultural production processes.

There is need to allocate more land to refugees for Agriculture. The land allocated to refugees for farming is inadequate for households to practice agriculture and meet their all-food needs. Where they have access to farming plots, refugees can often grow enough to increase their food security, reducing dependence and increasing self-reliance. With access to more land, refugees could even produce enough to enter lucrative markets and prosper. They could contribute to local economic development while providing for themselves and their families, bene-

fitting refugees and host communities. This will help refugee producers improve production, increase sales, enter new markets and build resilience to climate-related and market shocks.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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