

# **NURI CSA Adoption Study**

## **Northwest Nile**

**October – November 2021**



**NURI**



**Danida**



**Final**

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# **EXECUTIVE SUMMARY**

## **Introduction and methodology**

NURI seeks to enhance resilience and equitable economic development in Northern Uganda. Its focus includes Climate Smart Agriculture (CSA), Rural Infrastructure (RI) and Water Resources Management (WRM). Under CSA, farmer groups are trained on various aspects of CSA through 10 sessions using a demo plot approach, to encourage improved farming practices. It is expected that, when farmers adopt the practices, their production levels will improve. CSA training started in North West Nile in 2019 with only refugee groups but in 2020 new nationals were selected and their first year of training started. At the time of the study, farmer groups were for their second year of training in Climate Smart Agriculture practices. The 4 districts covered in North West Nile are Adjumani, Koboko, Moyo and Obongi. The farmer groups were assessed to determine the level of learning and adoption of CSA practices by CSA groups, since joining NURI programme, and identify factors influencing adoption of the practices.

Both qualitative and quantitative data collection techniques were employed during across-sectional study to obtain data from 1,476 farmers of the host communities and 420 members of mixed groups' groups as well as leaders in the communities. Statistical Package for Social Scientists (SPSS) was used to perform analysis of quantitative data while thematic and content analysis was used for the qualitative data.

## **KEY FINDINGS**

### **Demographics of respondents**

Reflecting actual group membership of national groups, female farmers sampled in the study were twice the number of their male counterparts. The youth (18-28 years old) farmers constituted about 20% of the sample and 80% were adults aged at least 29 years. Majority (66.5%) of the respondents had attained primary as their highest education level. Slightly over three quarters (76.4%) of the respondents were from male-headed households and 11% were headed by youths (18-28 years). Similarly, among Mixed group members, more females (63.6%) than males (36.4%) were interviewed. The sample comprised of 71% refugees and 29% host nationals, 23.8% youth, 60.7% had attained primary education and nearly all (97.6%) listed farming as their main occupation. Youth-headed households made up 14.7% of the sample while 39.5% of the households were female-headed.

### **Household size**

The average HH size for the new national farmer groups was 7 persons, each household having 4 children (0-17 years), 2 youth aged 18-28 years, and 2 adults aged at least 29 years on average. Among the mixed group HHs, the average HH size was also 7 of with 4 children (0-17years), 2 youth (18-28) and 2 adults on average. Adjumani district had the highest HH size (8) for both new nationals and Mixed groups.

### **Composition and leadership of groups**

New national farmer groups had 30 members on average with 70% female membership. On average, youth (18-28 years) per group were 8 members and adults aged at least 29 years and above were 21 in a group. Most of the key leadership positions, namely group chairperson and secretary, were dominated by male members and females mostly occupied positions of group vice-chairperson and treasurer. Among the Mixed groups, majority of members were female (21) with 9 males per group on average. The mean number of youth (18-28 years) was 7 persons per group while those at least 29 years were 23. Male members also dominated the key leadership positions, particularly group chairperson.

### **CSA training and its relevance in on-farm production activities**

All (99.5% of the new national farmers and all (100%) mixed groups attended the NURI CSA training conducted in 2020. Majority of new national farmers (78.1%) and mixed groups (94.2%) were trained for the first time and reported having learnt at least three new practices during the training. A total of 10

sessions/topics were covered with varied levels of attendance. Only 39% of the new nationals and 50% of the mixed groups fully attended all the 10 training sessions. No single session/topic was reportedly attended by all respondents. Despite the variations in attendance, 84.8% of respondents found the duration of the sessions appropriate. The timing of the training (the farming calendar) was rated as very good (47.9%) and good (43.1%). Further, a majority (90%) found CSA training relevant to their daily on-farm production activities; across all the 10 sessions and only about 10% felt they were not relevant.

### **Strategic crops grown**

Strategic crops grown in 2021 by members of the new national farmer group included Soyabeans, Sesame, Maize, Groundnuts, Cassava and Beans. The majority (76%) were growing these same crops even before joining NURI. Thus, only 24% had grown them for the first time, most of whom were in the districts of Moyo (44%) and Obongi (39%). Farmers who reported growing strategic crops for the first time, were mostly growing soyabeans (41.6%) and maize (30.5%). Very few farmers (less than 13%) planted beans and sesame for the first time. Even among the Mixed groups, strategic crops grown included Sesame, Maize, Groundnuts, Cassava and Beans. Majority (79%) had grown them before the training. Only 21.3% in Adjumani and 20.7% in Obongi grew them for the first time.

### **Seedbed preparation for production**

Use of the recommended seedbed practices was high in both new national farmer groups and Mixed groups in the 2021. Most new national farmers (60%) usually cut shrubs/trees while 36% slashed to clear their fields before ploughing. Only 7.3% reportedly used burning and 1% used chemicals to clear the bushes for ploughing. Nearly all members in the new national farmer groups who attended the CSA training were not using chemicals. The farmers who used burning were mostly in Koboko (11%) and Adjumani (8.1%). Slashing as a method was more predominant in Koboko (95%) while most farmers (over 72%) in Adjumani, Moyo and Obongi used cutting of shrubs to clear land for ploughing. The most used method to till the land during ploughing were hand-hoe (65.6%) and animal traction (47%). Less than 3% of the farmers used a tractor for ploughing. Majority (81%) ploughed their fields twice before planting.

About mixed groups, slightly over 80% cut the shrubs and about 20% used slashing to clear their fields before ploughing. About 90% used the hand-hoe and only 18.8% employed animal traction to plough the land for planting while less than 2% used a tractor. Slightly over 81% of the mixed groups ploughed the fields twice before planting.

### **Use of improved seeds before and after NURI training**

Prior to joining NURI, only 20.3% of new national farmers planted improved seeds of the grown strategic crops while 71.8% used local seeds and 7.9% used improved and local seeds. After the NURI training, use of improved seeds increased to 79% and the farmers who used both reduced to 6.4%. The highest adoption of improved seeds was recorded in the districts of Obongi, Koboko and Moyo. Adjumani had the least change (from 23% to 68%) in use of improved seeds for strategic crops

Most of the farmers still planting local seeds were in Adjumani (28.2%); Moyo had only 3.4%, 7.9% in Obongi and by 8.7% in Koboko. Among farmers that planted improved seeds, 83.3% obtained them from a demonstration plot, only 5.7% bought from an input dealer. Recall of the elements covered under the training session on improved seeds was very high, although not the same in all the four districts, being slightly lower in Adjumani, where evidence of use of improved seeds was also lower (68.5%) than the other districts of Koboko (87.5%), Obongi (88.3%) and Moyo (90.9%).

Similarly, only 12.3% of the mixed groups used improved seeds prior to joining NURI. The proportion of Mixed group members that planted improved seeds increased to over 99%. Thus, adaptation of use of

improved seeds among mixed groups was much higher than among the host farmers. No significant differences in the distribution of the results across membership categories (refugees vs Hosts) were observed.

### **Methods of planting seeds before and after NURI training**

Prior to joining NURI, only 28.5% of new national farmers and 11% of Mixed group members planted seeds in lines. However, farmers quickly adopted the practice of line planting after the training. Following the NURI training in 2020 and 2021, the proportion of farmers that planted their strategic crops in lines increased to 67.2% among the new national farmers and 72.1% among the mixed groups. Line planting was new to 68.4% of the new national farmers and 73.3% of the Mixed group members.

The new national farmers planted their crops in lines with spacing commonly used between rows of 114 and 83 centimetres for cassava and maize respectively while spacing between plants was 117 and 85 centimeters for the two crops respectively. Beans, groundnuts and soyabeans had an average spacing of 45-53 centimetres between rows. Sesame had the least spacing of 33.5 centimetres between the rows. The average spacing between plants for beans, groundnuts, soyabeans and sesame was almost the same, varying from 12.8 to 14.7 centimetres.

### **Pests and diseases control and weeding**

Nearly all farmers (99% Mixed group members and 94.1% new national farmers) removed unwanted plants from their crops. Of these, slightly over 94% and 81.9% of the mixed groups while about 98.9% and 92% of the new national farmers weeded their fields once or twice before joining NURI and during this season respectively. Correct weeding practices were observed mostly among farmers who were growing soyabeans (89.8%), beans (80.9%), maize (78.8%), cassava (76.3%) and groundnuts (75.1%). Nearly all had completed the first weeding. Regarding pests, occurrence of pests and diseases was reported mostly by farmers of maize, beans, groundnuts and soyabeans. Although recall of the measures of control was notably high, adoption/use of these measures was low. Only 52.1% of the new national farmers and 55.9% of the mixed groups were found with correct pests and diseases control measures in their fields.

### **Soil fertility and water management**

Slightly over 85% of the new national farmers and 94.2% of the mixed groups rated the fertility of their soils as good or very good. Majority (90.2%) of the farmers' recall learning that mulching helps in soil fertility and water management. Adoption of measures for ensuring good soil fertility and water management was observed on the fields for 77.1% of the new national farmers and 79.7% of the mixed group members, with no significant variation between host nationals and refugees as well as across the 2 districts.

### **Post-harvest handling (PHH) and value addition**

Reports of application of post-harvest handling (PHH) measures were high. Over 72% of the new national farmers and 80.6% of the mixed groups applied PHH measures during and after harvesting their crops in the 2020 planting season. The most common PHH measures applied were harvesting only the matured crops, use of improved methods of drying produce, use of constructed drying platforms and threshing on tarpaulins. However, processing of produce to add value was quite low. Only 31.3% of the new national farmers and 51.6% of mixed groups reported to have added value on their produce before marketing or storage. In Koboko, 92% of new national farmers and 73.2% in Adjumani sold their produce without any value addition. For the mixed groups, equal proportions of members in both districts and slightly more refugees (83.3%) than host nationals (73.3%) added value on their produce before marketing..

## **Marketing produce**

A low level of collective marketing was noted in both new national farmers and mixed groups. Only 46.4% of the new national farmers and 58% of the mixed groups sold their produce as a group. The districts of Koboko and Adjumani notably marketed collectively (66.4% and 55.8% respectively) among the new national farmers. For the mixed groups, more produce in Obongi district (50%) was marketed collectively than that in Adjumani district (34.6%) and more host nationals (60.2%) sold their crop produce collectively than the refugees (57.1%).

## **Adoption of CSA practices**

A high proportion of new nationals households (91.2%) and mixed groups members (94.8%) adopted at least 3 CSA practices learnt during the training. Among the new nationals, Koboko district had the highest proportion of HHs (96.2%) and Moyo (87.7%) had the least proportion of HHs that adopted at least 3 CSA practices. Adjumani district had slightly higher proportion of mixed group members that adopted at least 3 CSA practices (96.7%) than Obongi district (92.6%). Similarly, slightly more refugees (95.0%) adopted at least 3 CSA practices than the host nationals (94.3%).

## **Conclusion**

Overall, 99.5% of new national farmer group members and all (100%) mixed group members covered in the adoption study attended the CSA training. Although there was high degree of full attendance of individual sessions, the low percentage of full attendance of all the 10 sessions was observed. Only 39% of the new nationals and 60% of the mixed groups fully attended all the 10 training sessions. It was also observed that recall of the various elements covered under the 10 sessions/topics was generally high but not universal. The timing of the training sessions vis-à-vis the farming calendar and duration of the sessions were considered to be appropriate and highly appreciated.

The degree of adoption of at least 3 new CSA practices was high in both new national farmers (91.2%) and mixed groups (94.8%) but varied across districts and mixed group membership category. Practices where high levels of adoption was observed in new national farmers' fields included *weeding*, *“methods of planting seeds”*, *“soil fertility and water management”*, *“use of improved seeds”*, and *“post-harvest handling”*. The adoption of *“seedbed preparation”*, *“Pests and disease control”*, *“value addition”*, and *“collective marketing”* remains low. Land tillage was still predominantly reliant on the hand-hoe; few farmers had adopted mechanized methods such as animal traction or tractors. The acreage of land cultivated was relatively small, the mean size for most HHs both nationals and mixed groups not exceeding 0.9 acres.

Adoption of recommended practices is reportedly affected by a range of factors including; farmers adhering to the NURI guidance provided during the training, cohesion within the group, farmers' perception of new practices as labour intensive and shortage of manpower to work in farmers' fields. Other factors are lack of continuous support supervision/mentorship post training, shortage of land for cultivation/lack of money for renting land especially among refugees, unfavorable climatic conditions/unfavorable soil conditions/or rains coming late, environmental degradation, negative attitudes towards the new practices and lack of resources for inputs.

## **Recommendations**

Drawing from the findings, the following suggestions are made to ensure the programme attains all its objectives and to inform future programming.

- There is need to revisit the training plans and carry out consultations to understand why there was no universal attendance of the sessions. NURI needs to ensure that all targeted farmers fully attend all sessions with undivided attention.
- Need to hold refresher trainings with all farmers on all sessions/topics where adoption of the new farming practices is generally low.

- Intensify visits to farmers' fields to observe and encourage adoption of the various CSA practices right from seedbed preparation to PHH.
- Support the farmers' groups to have exchange visits among the groups to allow them exchange ideas and experiences across districts/sub counties
- Members of farmers groups should be supported to explore opportunities for increasing the acreage of land cultivated. Sub-county staff should be engaged to help farmers identify large chunks of land that can be used by the groups.
- Members of the various farmers' groups should be encouraged and supported to grow a common strategic crop to ensure the quantities that support collective marketing are readily available.
- Support farmers to adopt modern methods of tilling land reducing reliance on the hand hoe.
- Support members of the farmer groups to access machinery for value addition.



## **1.0 INTRODUCTION AND METHODOLOGY**

### **1.1 Background**

The Northern Uganda Resilience Initiative (NURI) is one of three engagements under the Uganda Programme on Sustainable and Inclusive Development of the Economy (UPSIDE), which is one of the two thematic programmes of the Danish Country Programme for Uganda 2018-2022, for which a Memorandum of Understanding (MoU) has been signed between the Government of Denmark and the Government of Uganda.

The objective of NURI at outcome level is *enhanced resilience and equitable economic development in supported areas of Northern Uganda, including for refugees and refugee-hosting communities*. NURI pursues this objective by supporting activities in climate smart agriculture (CSA), rural infrastructure (RA), and water resources management (WRM). Activities in support of agriculture focus on improving farmers' knowledge on climate-smart production methods, as well as their understanding of and ability to engage with markets and services. Support to rural infrastructure and water resource management are in those areas that contribute to agriculture sector outcomes, particularly access to markets and improving water resource management within the landscape.

Geographically NURI covers 13 districts in the West Nile and Acholi Sub Regions of Northern Uganda. The districts for management purposes have been broken into regions where now we have Acholi sub-region covering Agago, Kitgum and Lamwo, South West-Nile covering Arua, Madi-Okollo, Terego, Nebbi, Zombo and Pakwach and North West-Nile covering Adjumani, Moyo Obongi and Koboko. Besides targeting nationals in these districts, NURI works with refugee settlements within some of the selected districts. Selected settlements are Rhino Camp Refugee Settlement in Arua, Madi-Okollo, Imvepi settlement in Terego District, Palorinya Refugee Settlement in Obongi District, Mungula and Maaji refugee settlements in Adjumani District and Palabek Refugee Settlement in Lamwo District.

One of the intervention areas of NURI is CSA, where the objective is to increase agricultural output of small-scale farmers. NURI supports the new nationals and refugee groups under CSA with training and inputs for establishment of demo plots. The implementation of NURI CSA activities kick started early 2019, first in Southwest-Nile and Acholi sub-region and later North West-Nile supporting only refugee groups. In 2020, new nationals were selected for support in Northwest Nile and activities with the selected groups started in January 2020. Adoption of CSA practices is one important output indicator that NURI has to monitor and report on. Since new nationals started in 2020 and are now in their second year of support under the NURI programme, an adoption study has therefore been conducted targeting the new nationals and mixed groups in Northwest Nile covering the districts of Adjumani, Moyo, Obongi and Koboko to report on the outcome indicator.

### **1.2 Objectives and Scope of the Adoption study**

The aim of this study was to assess the extent to which farmers applied various CSA practices as learnt from the demo fields. It further provides a basis for assessing CSA training impact and make comparisons with farmer groups indigenous knowledge.

#### **Purpose and objectives**

The study therefore was intended to determine the level of learning and adoption of CSA practices by CSA groups, since joining NURI programme and identify factors influencing adoption. Specifically, the study aimed at.

1. Establishing CSA practices learned by farmers while participating in NURI training.
2. Assessing the extent to which farmers are adopting CSA practices learnt from NURI trainings.
3. Identifying factors influencing adoption of NURI CSA practices by farmers participating in trainings.

### Scope of the study

This adoption study was limited to understanding adoption of CSA practices among members of farmers groups in the districts of Adjumani, Moyo, Obongi and Koboko that received CSA training in 2020. The study was conducted in October 2021 covering the first and second seasons for the 2021 planting season and production for 2020 for the strategic crops that the respondents were trained on. Within the districts, the assessment was limited to only the sampled sub-counties.

## 1.3 Methodology

### 1.3.1 Overall Design

The study was carried out in the 4 programme supported districts of Northwest Nile: Adjumani, Koboko, Moyo and Obongi. In these districts, the study covered members of the new national farmers groups while Mixed groups were covered in the refugee hosting districts of Adjumani and Obongi.

#### Indicators of study

S/N	Indicator name	Data collection method and tool	Comments
<b>Objective for strategic intervention 1: To increase the agricultural output of small-scale farmers</b>			
1.	Cumulative percentage of participating households adopting additional CSA practices.	HH interviews	
<b>Main activities: Agricultural output of small-scale farmers including for refugees increased</b>			
1.1	% of new national farmer groups and refugee groups reporting having learnt at least 3 new practices	HH interviews	

### 1.3.2 Study Population

The study targeted farmers participating in the implementation of activities under output 1 of NURI programme which is CSA, covering new national farmer groups and Mixed groups participating in the project. Eligible persons to participate in this adoption study were those that had participated in the CSA training in 2020 and/or 2021.

### 1.3.3 Sample Size

The sample for this adoption study comprises of two components: members of the new national farmers groups and, the second members of the Mixed groups. Sample size for the new national farmers groups was 1,476 respondents drawn from the 4 NURI districts of Northwest Nile. The sample was distributed among the districts using a probability proportionate to size approach. The level of confidence was 95% and margin of error of 0.04 and z-score of 1.96. Adjumani contributed 554 respondents to the overall sample, the districts of Koboko and Moyo contributed 363 and 365 respondents respectively while 194 respondents were drawn from Obongi district. Table 1 below shows the sub-counties from where the respondents came.

**Table 1: Sub-counties visited per district and number of households covered**

District	Sub- County	No. of HHs visited	No. of HHs covered in District
ADJUMANI	ARINYAPI	26	555
	CIFORO	99	
	ITIRIKA	123	
	PACARA	91	
	PAKALE	118	
	UKUSIJONI	98	
KOBOKO	ABUKU	71	363
	DRANYA	70	
	KULUBA	69	
	LOBULE	82	
	LUDARA	71	
MOYO	ALUR	14	364
	LAROPI	89	
	LEFORI	90	
	METU	90	
	MOYO	81	
OBONGI	GEMARA	93	194
	ITULA	78	
	PALORINYA	23	

**Mixed groups**

Sample size for the Mixed groups was 420 respondents drawn from 2 districts, namely Adjumani and Obongi. The sample drawn was nearly equally distributed between the two districts. From Adjumani, a total of 217 respondents were covered while Obongi contributed 203 respondents. The number of households for the refugees (298) covered in these groups were more than twice the households for the host nationals (122). The distribution of the sample within participating sub-counties is presented in the table below.

**Table 2: Refugee settlements visited, and number of households covered**

District	Subcounty	Household type		
		Refugee	National	Total
ADJUMANI	MAAJI	113	67	180
	MUNGULA	13	24	37
	<b>Sub-Total</b>	<b>126</b>	<b>91</b>	<b>217</b>
OBONGI	BUDRI	5	0	5
	ITULA	0	1	1
	MOROB	11	0	11
	ORINYA	5	0	5
	PALORINYA	148	30	178
	UDRAJI	3	0	3
	<b>Sub-Total</b>	<b>172</b>	<b>31</b>	<b>203</b>
<b>Total</b>		<b>298</b>	<b>122</b>	<b>420</b>

### **1.3.4 Methods of Data Collection**

Data collection was conducted through quantitative and qualitative methods.

Structured interviewing: Structured direct interviews were carried out with members of the new national farmers groups and members of Mixed groups who were participating in implementation of NURI activities. A structured questionnaire was developed and used to collect data from each of the categories of respondents. Each questionnaire covered questions on a wide range of aspects including socioeconomic characteristics, farmer group establishment activities, CSA training attendance and learning new practices, strategic crops grown and application of CSA practices on farmer fields as well as post-harvest handling and value addition.

Key informant interview: In-depth interviews were held with various key informants selected from key stakeholders. The key informants mainly included leaders of district local government (*Local council executive members, Chief Administrative Officers, Community Development Officers, Subcounty chiefs*), district agricultural officials and refugee leaders. A key informant interview guide was used to collect the required data.

Focus group discussion; FGDs were organized and conducted with different groups of farmers. These helped in providing insights and explanations on knowledge and practices by the farmers. Using a FGD guide, the discussions were held with various groups of farmers.

Data quality control: To ensure quality of data, NURI recruited study research assistants among its field workers in each district. The identified staff were graduates, conversant with the local languages spoken in the respective districts. The research assistants were also selected on the basis of skills and experience in conducting quantitative data collection, in-depth interviewing, and moderating FGDs. A 4-days training workshop was held to equip all the identified research assistants with the requisite skills and competences in both data collection procedures and correctly translating the tools into the local languages, i.e., Madi for Adjumani, Kakwa for Koboko etc. All the study tools were pre-tested to ensure adequacy prior to the main field work exercise.

During field work, all the completed data collection tools were edited at the end of each day and identified errors were addressed the following day. All the filled tools were kept under lock and key to limit accessibility and prevent data tampering.

### **1.3.5 Data Processing and Analysis**

All dully filled questionnaires were verified, edited (in the field and in office) and electronically captured using a statistical package known as EpiData, a suitable software enriched with data validation instruments to ensure minimal data entry errors. EpiData software was selected due to its capabilities; easy to use especially during the development of data entry module and data cleaning, free of charge and it is versatile with ability to export data to various statistical packages including SPSS. Double data entry system was used to ensure a high degree of accuracy of captured data. After data entry, data were cleaned and exported to SPSS software (Statistical Package for Social Scientists) for processing and analysis. SPSS was easily accessible and could ably handle the required analysis of the study with limited programming. Both univariate and bivariate analysis were performed based on the study objective.

## **2.0 RESULTS FOR NEW NATIONAL FARMERS**

### **2.1 Socio-demographic Characteristics of Respondents**

Adoption of CSA practices is a process that involves change of behaviour on the part of farmers. Socio-demographic characteristics of the targeted farmers play an important role in influencing the farmers' decisions on adoption of practices. Hence, these characteristics can assist to explain the impact of the intervention at evaluation.

#### **Gender of respondents**

Respondents in this adoption study were all members of the new national farmer groups, comprising both male and females of varied ages, education, and literacy levels. Females were the majority comprising 66.6% of the sample. Obongi district (40.2%) had slightly more female respondents than the other 3 districts (31.0-34.7%).

#### **Age of respondents**

Overall, the sample constituted 20.4% youth aged 18-28 years and 79.6% adults aged over 28 years. Moyo district had slightly fewer youths (15%) compared to other 3 districts. Majority of households (about 89%) in the study were headed by adults aged above 28 years and only 11% of the household heads were youth, aged between 18-28 years. The youth headed households were more in the districts of Obongi and Adjumani (more than 11%) than in the districts of Moyo and Koboko (less than 10%).

#### **Household category**

Most of the new national farmer households (HHs) were male headed (76.4%) and the female headed households constituted only 23.6%. There were no child headed and female managed households registered during the study. Moyo district had the highest proportion of female-headed households (32.9%) while Koboko district had 22% female-headed households, about 20% of the households in Adjumani and Obongi were female-headed.

#### **Occupation of respondents**

The main occupation of respondents was farming (96.4%) and very few respondents reportedly engage in businesses (2.2%) as their main source of livelihood. Only 1.4% of the respondents participate in other economic activities. Similar distribution of main occupation was observed across all the 4 districts.

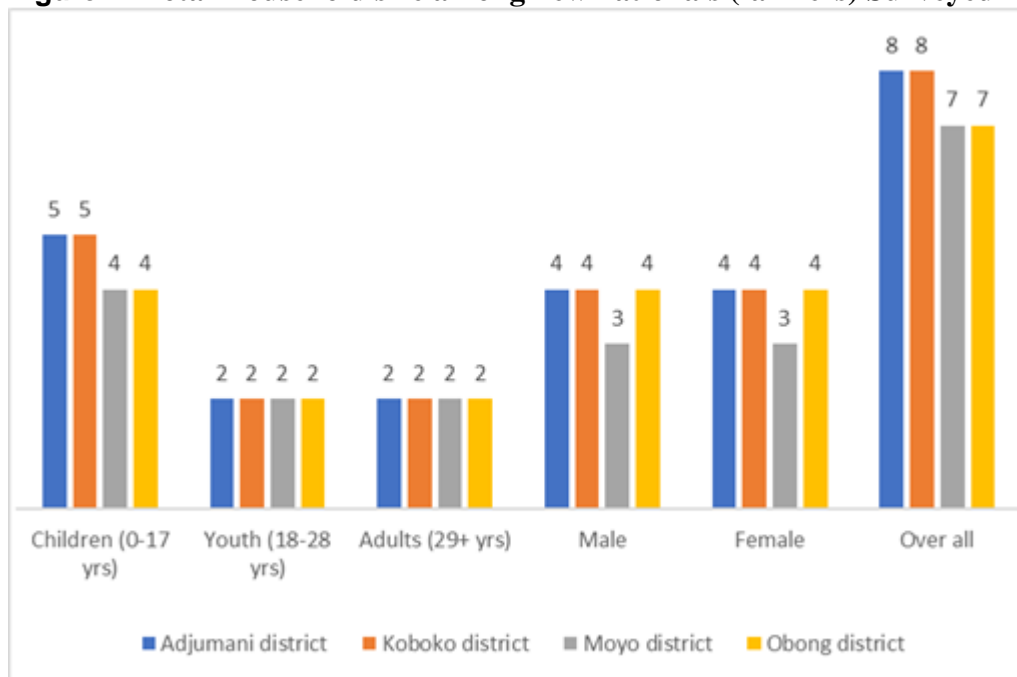
#### **Education status of respondents**

The study results revealed that about 87% of the persons who participated in the study had attained at least primary education; only 13% had no formal education. Primary education (upper and lower respectively) were the highest levels of education attained by majority (66.5%) of the new national farmers interviewed. Only 2.3% of the respondents had tertiary education.. Higher proportion of respondents with no formal education was in Koboko district (22.9%), the other 3 districts had less than 13% with no formal education (See Table 3 below).

#### **Household size**

In terms of HH size, Adjumani and Koboko had the highest mean number at eight (8) members while Obongi and Moyo had seven (7). Each HH had two (2) adults aged 29 and above, two (2) youth aged 18-28 and between 4-5 children aged 0-17 years which denotes a high dependency ratio. On average each new national farmer's HH in Adjumani and Koboko had 5 children and the HH in Obongi and Moyo had 4 children on average (see Figure 1 below).

**Figure 1: Total Household size among new nationals (farmers) Surveyed**



**Table 3: Socio-demographic characteristics of respondents from farmers' groups**

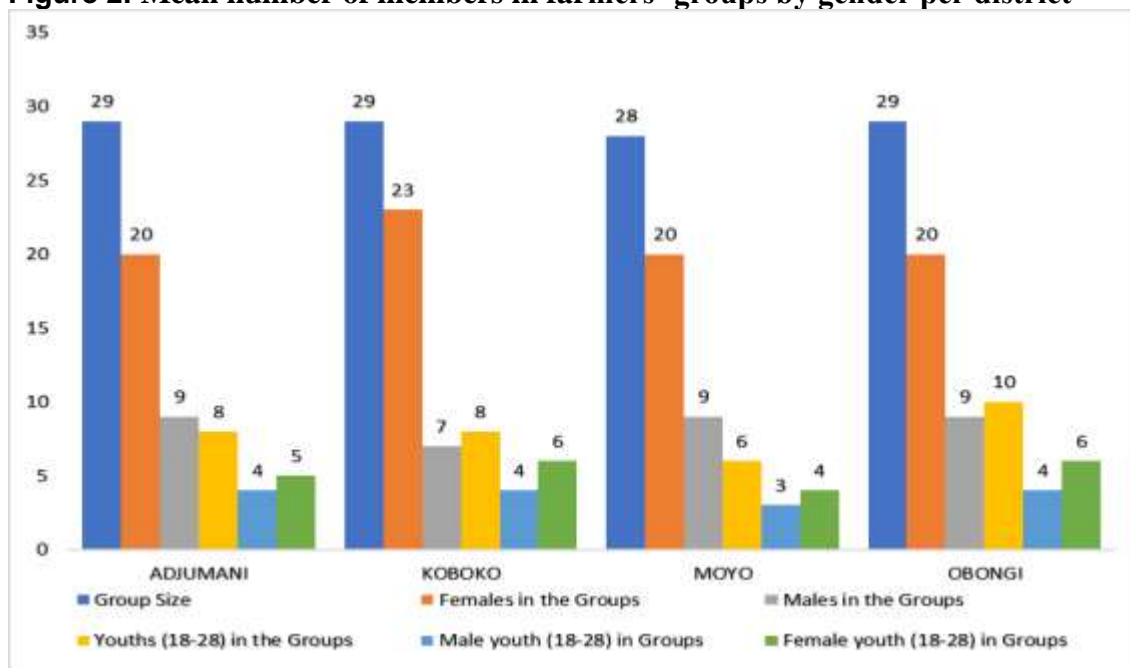
		ADJUMANI		KOBOKO		MOYO		OBONGI		Total	
		HHs	Percent	HHs	Percent	HHs	Percent	HHs	Percent	HHs	Percent
Gender of respondents	Male	192	34.7%	110	30.3%	113	31.0%	78	40.2%	493	33.4%
	Female	362	65.3%	253	69.7%	252	69.0%	116	59.8%	983	66.6%
Age of respondents	18-28	116	20.9%	75	20.7%	55	15.1%	55	28.5%	301	20.4%
	29-38	182	32.9%	110	30.4%	94	25.8%	63	32.6%	449	30.5%
	39-48	142	25.6%	93	25.7%	96	26.3%	39	20.2%	370	25.1%
	49+	114	20.6%	84	23.2%	120	32.9%	36	18.7%	354	24.0%
Highest level of education attained	No formal education	50	9.2%	83	22.9%	32	8.9%	24	12.6%	189	13.0%
	Lower-level primary education (P.1–P.4)	177	32.5%	103	28.5%	110	30.7%	40	21.1%	430	29.6%
	Upper-level primary education (P.5–P.7)	207	38.0%	124	34.3%	134	37.4%	74	38.9%	539	37.0%
	O-level (S1-S4)	93	17.1%	44	12.2%	62	17.3%	48	25.3%	247	17.0%
	A-level (S5-S6)	4	0.7%	4	1.1%	8	2.2%	0	0.0%	16	1.1%
	Tertiary Institution	13	2.4%	3	0.8%	12	3.4%	4	2.1%	32	2.2%
Main occupation of respondents	Other occupations	6	1.1%	4	1.1%	9	2.5%	1	0.5%	20	1.4%
	Farming	521	95.8%	347	96.1%	355	97.3%	189	97.4%	1412	96.4%
	Business	17	3.1%	10	2.8%	1	0.3%	4	2.1%	32	2.2%
Type of household headship	Male headed	444	80.1%	283	78.0%	245	67.1%	156	80.4%	1128	76.4%
	Female headed	110	19.9%	80	22.0%	120	32.9%	38	19.6%	348	23.6%
Age of the household heads	18-28	66	12.7%	34	9.4%	26	7.3%	37	19.3%	163	11.4%
	29-38	155	29.8%	98	27.1%	96	26.8%	57	29.7%	406	28.4%
	39-48	160	30.7%	95	26.3%	91	25.4%	51	26.6%	397	27.7%
	49+	140	26.9%	134	37.1%	145	40.5%	47	24.5%	466	32.5%

## 2.2 Farmer Group Establishment

### Group membership

This study sought to monitor composition of the groups supported. The study findings show that the average group size was almost the same across the 4 districts. Apart from Koboko districts with 28 members on average, the average group size was 29 members per district for the rest of the districts. In all the districts, the average number of female group members (at least 20) was more than twice their male counterparts (less than 10). Groups in Koboko had the highest average number of females (23) and the least number of male members (7 males) while in Adjumani, Moyo and Obongi membership comprised 20 females and 9 males. In terms of age of group members, results show that youths (18-28 years) were few across the four (4) districts ranging between 6-10 out of 29 members, indicating that all New National Farmers groups were dominated by adults above 28 years. Further disaggregation shows that on average each group had 3-4 male youth and 5-6 female youths aged 18-28 years (see Figure 2 below).

**Figure 2: Mean number of members in farmers' groups by gender per district**



### Group functionality before and after start of NURI

Each participant in the adoption study was asked to indicate whether various aspects were functional in their groups before start-up of CSA training by NURI. The group aspects assessed included *existence of clear goal/objective/plan*, *existence of a constitution and whether members abide by the constitution if it existed*, *leadership and if they were elected*, *proper records/documentation of group activities*, and *regular meetings and attendance by members*. Reports from the members indicated that nearly all groups were functional and had in place all the pre-requisites for running a farmers group. Over 90% of all members surveyed reported that their groups had a constitution abided with by the members, with clear goals, objectives, and plans (91.2%). Further, 92.5% reported having elected leadership, kept proper records of all activities undertaken by the group (90.9%), and held regular meetings attended by the members (91.9%). Nearly all respondents from Moyo (97.3%) affirmed that all the above aspects were functional in their groups before start-up of CSA training by NURI. Functionality of groups in Obongi was reported by 94% of the members surveyed, 92.5% in Koboko and 85.7% in Adjumani, which denotes that nearly all the new national farmer groups had in place all governance and administrative requirements and were following them. Very high proportions of the KIIs confirmed the functionality of the farmer groups in their communities as indicated in the table 4 below.



**Table 4: Reports on functionality of governance and administrative structures of groups before start-up of CSA training by NURI**

Governance and Administrative Aspects of Groups	ADJUMANI		KOBOKO		MOYO		OBONGI		Total		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Functional aspects of the group before start-up of CSA training by NURI:											
Clear goal/objective/plan:	460	84.9%	336	92.8%	355	97.8%	181	93.3%	1332	91.2%	
Constitution & if members abide by it:	459	84.7%	328	90.9%	351	96.7%	182	93.8%	1320	90.4%	
Leadership & if they were elected:	478	88.0%	336	92.8%	355	97.8%	183	94.3%	1352	92.5%	
Proper records/documentation of group activities:	458	84.3%	336	93.1%	351	96.7%	183	94.3%	1328	90.9%	
Regular meetings & attendance by members:	467	86.6%	330	92.7%	352	97.5%	182	94.3%	1331	91.9%	
Establishment for Farmer groups supported under the NURI programme as observed by KIIs											
Clear goal/objective/plan	18	66.7%	17	100.0%	11	91.7%	4	100.0%	50	83.3%	
Constitution & if members abide by it	23	85.2%	17	100.0%	10	83.3%	4	100.0%	54	90.0%	
Leadership & if they were elected	27	100.0%	17	100.0%	11	91.7%	4	100.0%	59	98.3%	
Proper records/documentation of group activities	23	85.2%	16	94.1%	12	100.0%	4	100.0%	55	91.7%	
Regular meetings & attendance by members	26	96.3%	14	82.4%	12	100.0%	4	100.0%	56	93.3%	
<b>Gender elected to fill the positions</b>											
Group Chairperson	Male	389	70.5%	117	32.2%	208	57.0%	133	68.6%	847	57.5%
	Female	163	29.5%	246	67.8%	157	43.0%	61	31.4%	627	42.5%
Vice Chairperson	Male	178	39.0%	138	38.8%	141	41.2%	94	55.3%	551	41.6%
	Female	278	61.0%	218	61.2%	201	58.8%	76	44.7%	773	58.4%
Treasurer	Male	55	10.1%	20	5.5%	13	3.6%	13	6.7%	101	6.9%
	Female	492	89.9%	343	94.5%	351	96.4%	181	93.3%	1367	93.1%
Secretary	Male	445	80.9%	248	68.3%	208	57.1%	163	84.0%	1064	72.3%
	Female	105	19.1%	115	31.7%	156	42.9%	31	16.0%	407	27.7%
Publicity/Mobiliser	Male	242	60.0%	172	49.3%	159	46.4%	110	61.1%	683	53.6%
	Female	161	40.0%	177	50.7%	184	53.6%	70	38.9%	592	46.4%
Security	Male	345	81.2%	226	68.1%	125	73.5%	109	69.0%	805	74.2%
	Female	80	18.8%	106	31.9%	45	26.5%	49	31.0%	280	25.8%
Others	Male	45	44.1%	9	29.0%	16	44.4%	8	50.0%	78	42.2%
	Female	57	55.9%	22	71.0%	20	55.6%	8	50.0%	107	57.8%

## Leadership of farmer groups

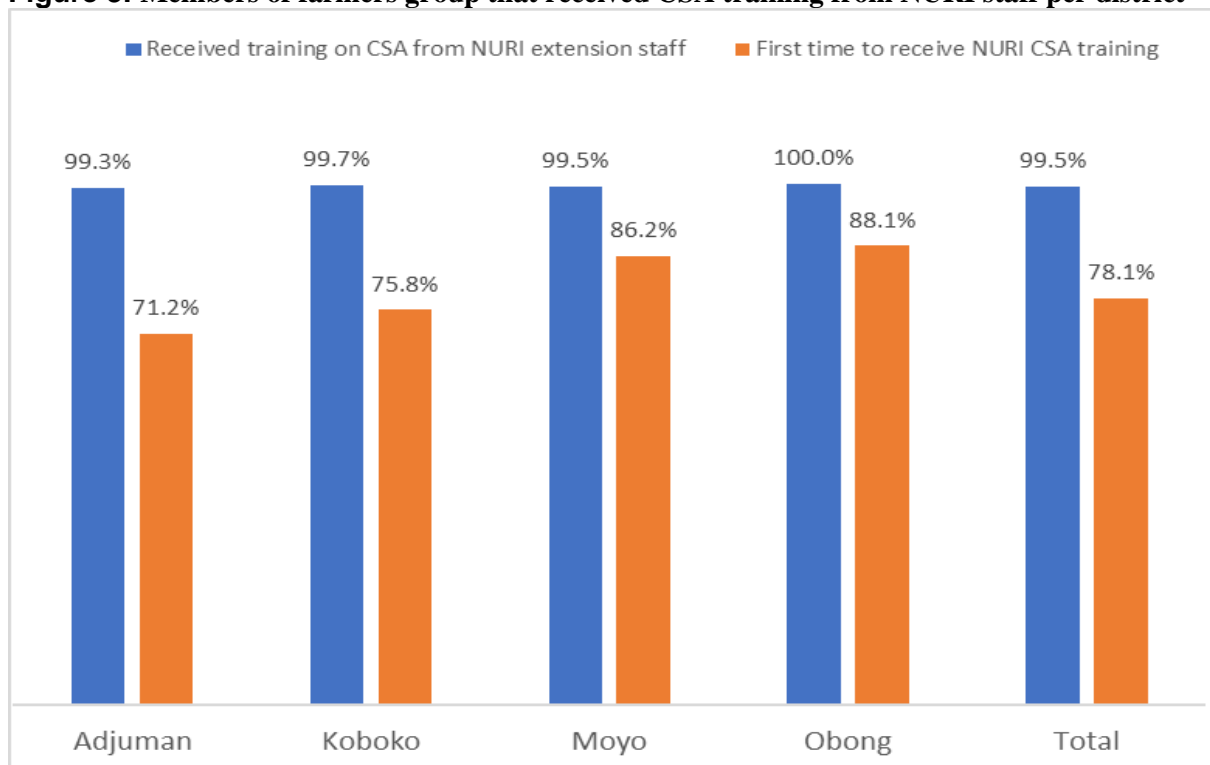
With regards to leadership of the farmer groups, nearly all respondents (over 95%) in the 4 districts were aware of the position of Group Chairperson, Vice Chairperson, Treasurer and Secretary. Other positions of leadership reported operational by some of the respondents included the position of “Publicity or Mobilizer” (96% of respondents from Koboko, 94% from Moyo, 93% from Obongi and 73% from Adjumani). While the position of Security was commonly reported by respondents in Adjumani, Koboko and Obongi; less than 50% of those from Moyo mentioned it among the leadership positions that existed in their groups. For the gender elected to fill the positions of leadership, results showed that despite group membership being female dominated, most leadership positions (except Vice chairperson and Treasurer) were taken up by males. Apart from Koboko where 67.8% reported that their Group Chairpersons are females, in all other districts more than half the respondents reported having male Group Chairpersons, with the highest proportion (70.5%) in Adjumani. The position of Treasurer was ring-fenced for females across nearly all groups in the four districts (see Table 4 above).

### 2.3 CSA Training and Learning New Practices.

#### Training by NURI and other sources

All members of the new national farmer groups that participated in this adoption study, except seven (7 (0.5%)) received training on CSA from NURI extension staff. All respondents from Obongi (100%), 99.7% from Koboko, 99.5% from Moyo and Adjumani (99.3%) received training on CSA from NURI extension staff. Over all, most of the respondents (over 78%) was their first time to receive this training since the establishment of their group. See Figure 3 below.

**Figure 3: Members of farmers group that received CSA training from NURI staff per district**



These respondents had received trainings from various sources including but not limited to NGOs, Government, Faith Based Organizations (FBOs) and peers. NGOs (*other than NURI*) were reported as the main source of similar trainings received. Of those groups previously trained,- those trained by NGOs were 87% in Adjumani, 73.5% in Moyo, 71.4% in Obongi and 67.8% in Koboko. Government Extension staff, peers and FBOs had trained about 19%, 2% and 1% of the respondents respectively.

## **Attendance of training sessions by farmer groups**

The training on CSA organized for farmer groups by NURI extension staff in 2020 comprised of 10 topics delivered in 10 distinct sessions. The training sessions for 2021 were still ongoing at the time of data collection. The topics are 1) setting ground rules, 2) climate, climate change and impact, 3) CSA practices and technologies, 4) enterprise selection for groups, 5) seed bed preparation, planting, intercropping, and weeding, 6) pests and disease control, 7) soil fertility and water management, 8) post-harvest handling and value addition, 9) business skills, and 10) marketing. All members of the new national farmer groups in the four districts were expected to attend all the sessions.

Results showed that although nearly all (99.5%) members of the new national farmers groups affirmed to have received training on CSA from NURI extension staff in 2020 and on-going in 2021, attendance of the 10 topics varied. No single topic received universal attendance by all members of the farmers' groups. Thirty-nine percent (39%) of the new nationals fully attended all the 10 training sessions and 55% fully attended between 5 and 9 sessions while 6% fully attended less than 5 sessions.

The most attended CSA topic (97.1%) was "*seed bed preparation, planting, intercropping and weeding*". Other topics with high level of attendance included "*post-harvest handling and value addition*" (90.7%) and "*CSA practices and technologies*" (90.5%). The least attended session was "*business skills*" (75.4%) and the proportion of group members that attended full sessions on most of the 10 topics covered did not exceed 85%. Over 93% of the respondents reported the topic on "*Seed bed preparation, planting, intercropping and weeding*" was the most fully attended sessions with no significant variation across the 4 districts. The districts of Moyo and Koboko had the highest number of group members that attended full sessions of the various CSA topics covered by NURI extension staff in 2020. For instance, over 85% of the respondents in Moyo (95%), Koboko (89.5%) and Obongi (85.6%) fully attended the topic on "*enterprise selection for groups*". Of the four (4) districts, Adjumani had the least number of group members that attended full sessions for nearly all the 10 topics except "*seed bed preparation, planting, intercropping and weeding*". Among farmer group members in Adjumani, the session on "*business skills*" was the least attended (56.2% of respondents). (See Table 5 below).

During the study, almost all the key informants who monitored the trainings, rated the attendance as good (66%) or very good (34%) respectively. Two thirds (62%) of the KIIs monitored the CSA trainings delivered by NURI extension staff.

## **CSA Training evaluation by participants**

Majority of group members (84.8%) that participated in the study, found the time appropriate. While 7.8% felt the duration of the training was too short, 7.4% found the time to be too long and complained that it was complained that it was encroaching into time for other activities. Across the four districts, results showed that 92.2% of respondents in Koboko, 84.5% in Adjumani, 82.6% in Obongi and 78.8% in Moyo rated the duration/length of the various training sessions as "*appropriate*". Similarly, majority (91%) rated the timing of the training sessions and the farming calendar as either very good or good. Those who felt that the timing of the trainings was poor and not well aligned with the farming calendar were less than 10%.

Results presented in Table 5 further show that nearly all (97.9%) of all group members that took part in the study were satisfied with the training methods adopted. Over 97.8% acknowledged that the training methods adopted were either very good or good. The highest proportion of respondents that rated the methods as very good were in Koboko (68.3%) and Adjumani (60.2%) districts. All the KIIs that participated in study also confirmed that the training methods used were quite satisfactory (Very good or good).

**Table 5: Attendance of CSA training, rating of session time and timing of the training sessions vis-à-vis the farming calendar**

		ADJUMANI		KOBOKO		MOYO		OBONGI		Total	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<b>CSA training sessions attended and time/quality of attendance</b>											
Setting ground rules:	Fully	409	74.2%	236	65.2%	322	88.7%	177	91.2%	1144	77.8%
	Partially	26	4.7%	25	6.9%	9	2.5%	2	1.0%	62	4.2%
	Not at all	116	21.1%	101	27.9%	32	8.8%	15	7.7%	264	18.0%
Climate, climate change and impact:	Fully	370	67.2%	302	83.4%	328	90.6%	166	85.6%	1166	79.4%
	Partially	51	9.3%	27	7.5%	13	3.6%	6	3.1%	97	6.6%
	Not at all	130	23.6%	33	9.1%	21	5.8%	22	11.3%	206	14.0%
CSA practices and technologies:	Fully	434	78.6%	323	89.2%	330	91.2%	167	86.5%	1254	85.4%
	Partially	39	7.1%	27	7.5%	8	2.2%	1	0.5%	75	5.1%
	Not at all	79	14.3%	12	3.3%	24	6.6%	25	13.0%	140	9.5%
Enterprise selection for groups:	Fully	404	73.6%	324	89.5%	344	95.0%	166	85.6%	1238	84.4%
	Partially	48	8.7%	18	5.0%	5	1.4%	4	2.1%	75	5.1%
	Not at all	97	17.7%	20	5.5%	13	3.6%	24	12.4%	154	10.5%
Seed bed preparation, planting, intercropping and weeding:	Fully	511	92.4%	346	95.3%	341	94.5%	175	90.2%	1373	93.3%
	Partially	27	4.9%	14	3.9%	8	2.2%	6	3.1%	55	3.7%
	Not at all	15	2.7%	3	0.8%	12	3.3%	13	6.7%	43	2.9%
Pests and disease control:	Fully	390	70.7%	304	83.7%	327	90.6%	167	86.1%	1188	80.8%
	Partially	52	9.4%	30	8.3%	11	3.0%	8	4.1%	101	6.9%
	Not at all	110	19.9%	29	8.0%	23	6.4%	19	9.8%	181	12.3%
Soil fertility and water management:	Fully	382	69.2%	307	84.6%	325	89.8%	166	85.6%	1180	80.2%
	Partially	54	9.8%	38	10.5%	12	3.3%	6	3.1%	110	7.5%
	Not at all	116	21.0%	18	5.0%	25	6.9%	22	11.3%	181	12.3%
Post-harvest handling and value addition:	Fully	431	78.2%	320	88.4%	335	92.3%	172	89.1%	1258	85.6%
	Partially	32	5.8%	29	8.0%	11	3.0%	3	1.6%	75	5.1%
	Not at all	88	16.0%	13	3.6%	17	4.7%	18	9.3%	136	9.3%
Business skills:	Fully	309	56.2%	202	56.0%	294	81.4%	164	84.5%	969	66.1%
	Partially	78	14.2%	40	11.1%	14	3.9%	5	2.6%	137	9.3%
	Not at all	163	29.6%	119	33.0%	53	14.7%	25	12.9%	360	24.6%
Marketing:	Fully	350	64.1%	284	79.6%	288	80.4%	152	81.7%	1074	74.2%
	Partially	62	11.4%	29	8.1%	13	3.6%	2	1.1%	106	7.3%
	Not at all	134	24.5%	44	12.3%	57	15.9%	32	17.2%	267	18.5%
<b>Rating of the time allocated to each CSA topic/training session:</b>	Too short	29	5.3%	22	6.1%	43	12.0%	19	10.0%	113	7.8%
	Too long	55	10.1%	6	1.7%	33	9.2%	14	7.4%	108	7.4%
	Appropriate	459	84.5%	333	92.2%	283	78.8%	157	82.6%	1232	84.8%
<b>Rating of the timing of the training sessions vis-à-vis the farming calendar</b>	Very Good	250	46.4%	229	63.6%	141	39.1%	72	38.7%	692	47.9%
	Good	215	39.9%	104	28.9%	204	56.5%	100	53.8%	623	43.1%

	<b>ADJUMANI</b>		<b>KOBOKO</b>		<b>MOYO</b>		<b>OBONGI</b>		<b>Total</b>		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
	Fair	60	11.1%	24	6.7%	14	3.9%	8	4.3%	106	7.3%
	Poor	14	2.6%	3	0.8%	2	0.6%	6	3.2%	25	1.7%
Participants' rating of the training methods used during the sessions:	Very Good	320	60.2%	244	68.3%	154	43.0%	71	38.2%	789	55.1%
	Good	198	37.2%	109	30.5%	196	54.7%	111	59.7%	614	42.8%
	Fair	13	2.4%	4	1.1%	8	2.2%	3	1.6%	28	2.0%
	Poor	1	0.2%	0	0.0%	0	0.0%	1	0.5%	2	0.1%

### **Relevance of CSA training to farmers daily on-farm production activities**

More than three quarters (over 75%) agreed that all topics were relevant to their daily on-farm production activities. Participants who felt that the topics covered in the training were not relevant to their daily on-farm production activities were in most cases less than a tenth of the sample except for “*business skills and marketing*”. About 24% and 20% of group members in Koboko and Adjumani districts respectively did not find the session on “*business skills*” relevant to their daily on-farm production activities. Similarly, 17.5% of group members in Adjumani and 11.5% in Obongi did not find the session on “*marketing*” relevant to their daily on-farm production activities. About 94% of farmers reported “*seed bed preparation, planting, intercropping and weeding*” as the most relevant session, followed by “*post-harvest handling and value addition*” (89.4%), *Enterprise selection for groups* (85.2%) and “*CSA practices and technologies*” (84.4%).

### **Farmer knowledge improvement through CSA training**

Regarding the influence on agricultural production knowledge, results showed that many members of the farmers groups that attended the CSA training sessions and participated in this adoption study felt that to “*a large extent*” NURI’s CSA training had improved their agricultural production knowledge. The view of 56.7% and 38.4% was that the training had to “*a large extent*” and “*moderate extent*” improved their agricultural production knowledge. Only 0.7% said the CSA training had no change and 4.2% found little change to their agricultural production knowledge. Across the four districts, more than 50% acknowledged the training greatly improved their agricultural production knowledge and they were more than willing to recommend it to other farmers in their communities. Results showed that 99.5% of members of the farmer groups in Obongi that attended the CSA training, 99.3% in Adjumani, 98.6% in Moyo and 97.2% in Koboko agreed they would recommend other farmers in their communities to attend a similar training in future. Refer to table 6 below for the detailed farmers’ groups assessment on relevance of the sessions attended and willingness to recommend similar trainings to other farmers in their community.

Some voices of new national farmer group members on how training has improved their agricultural production knowledge:

*I can now select better crops which have better market value...I used to produce for household consumption only but now I can sell some. My production increased because I now plant improved seeds, I plant in lines, plant in time, weed in time which gives me better crop yields*

*The training opened my eyes, now I do market analysis before planting a crop, now I take farming as a business not just growing crops for the sake of it .*

*The training gives good farming skills, it is worth recommending to other persons so as to improve every one’s household income.*

*Training sessions need to be made more regular to ensure easy adoption to new practices. There should be refresher trainings. Could plan to have two training sessions per month, improve on quality of demonstration pictures/learning aids.*

**Table 6: Relevance of sessions in the CSA training to farmers' daily on-farm production activities and improvement in agricultural knowledge**

		ADJUMANI		KOBOKO		MOYO		OBONGI		Total	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Farmers rating of relevance of sessions/topics covered in CSA training to on-farm activities											
Climate, climate Change and impact:	Very relevant	378	71.9%	293	82.1%	335	94.6%	171	90.0%	1177	82.5%
	Fairly relevant	67	12.7%	38	10.6%	12	3.4%	7	3.7%	124	8.7%
	Not relevant	81	15.4%	26	7.3%	7	2.0%	12	6.3%	126	8.8%
CSA practices and technologies:	Very relevant	424	78.1%	291	82.4%	341	96.1%	166	87.4%	1222	84.8%
	Fairly relevant	55	10.1%	55	15.6%	8	2.3%	12	6.3%	130	9.0%
	Not relevant	64	11.8%	7	2.0%	6	1.7%	12	6.3%	89	6.2%
Enterprise selection for groups:	Very relevant	392	75.8%	316	88.5%	343	96.1%	160	84.2%	1211	85.2%
	Fairly relevant	69	13.3%	33	9.2%	8	2.2%	11	5.8%	121	8.5%
	Not relevant	56	10.8%	8	2.2%	6	1.7%	19	10.0%	89	6.3%
Seed bed preparation, planting, intercropping & weeding:	Very relevant	504	91.8%	336	92.8%	346	96.4%	179	94.2%	1365	93.5%
	Fairly relevant	32	5.8%	22	6.1%	7	1.9%	5	2.6%	66	4.5%
	Not relevant	13	2.4%	4	1.1%	6	1.7%	6	3.2%	29	2.0%
Pests and disease control:	Very relevant	403	76.2%	280	78.2%	339	94.2%	172	90.1%	1194	83.0%
	Fairly relevant	75	14.2%	51	14.2%	11	3.1%	10	5.2%	147	10.2%
	Not relevant	51	9.6%	27	7.5%	10	2.8%	9	4.7%	97	6.7%
Soil fertility and water management:	Very relevant	399	76.0%	286	80.3%	344	95.3%	168	88.4%	1197	83.6%
	Fairly relevant	69	13.1%	51	14.3%	11	3.0%	11	5.8%	142	9.9%
	Not relevant	57	10.9%	19	5.3%	6	1.7%	11	5.8%	93	6.5%
Post-harvest handling and value addition:	Very relevant	448	84.4%	324	91.3%	340	94.7%	171	90.0%	1283	89.4%
	Fairly relevant	38	7.2%	19	5.4%	11	3.1%	9	4.7%	77	5.4%
	Not relevant	45	8.5%	12	3.4%	8	2.2%	10	5.3%	75	5.2%
Business skills:	Very relevant	336	64.5%	180	52.9%	301	85.5%	162	85.7%	979	69.8%
	Fairly relevant	79	15.2%	79	23.2%	22	6.2%	11	5.8%	191	13.6%
	Not relevant	106	20.3%	81	23.8%	29	8.2%	16	8.5%	232	16.5%
Marketing:	Very relevant	360	69.4%	267	75.9%	300	85.5%	150	82.4%	1077	76.7%
	Fairly relevant	68	13.1%	51	14.5%	17	4.8%	11	6.0%	147	10.5%
	Not relevant	91	17.5%	34	9.7%	34	9.7%	21	11.5%	180	12.8%
Extent the training improved farmers' agricultural production knowledge	No change	2	0.4%	1	0.3%	3	0.8%	4	2.1%	10	0.7%
	Little extent	12	2.2%	24	6.6%	18	5.0%	7	3.7%	61	4.2%
	Moderate extent	197	36.2%	133	36.8%	143	39.7%	84	44.9%	557	38.4%
	A large extent	333	61.2%	203	56.2%	196	54.4%	92	49.2%	824	56.7%
Willingness to recommend the CSA training to other farmers	Yes	547	99.3%	351	97.2%	354	98.6%	188	99.5%	1440	98.6%
	No	4	0.7%	10	2.8%	5	1.4%	1	0.5%	20	1.4%

## 2.4 Application of CSA Practices on Farmer Fields

### Strategic crops and CSA practices assessed.

NURI promoted the growing of Soyabeans, Sesame, Maize, Groundnuts, Cassava and Beans as strategic crops among new national farmer groups in Northwest Nile. The analysis showed that overall, only 24% were growing the promoted strategic crops for the first time, the 76% had grown the crops before the training. Across districts, Koboko and Adjumani districts had the highest proportion of respondents (91% and 85% respectively) who had grown the chosen strategic crops before the training. Moyo and Obongi districts had notable proportions (44% and 39%) that had not grown the strategic crops before. See figure 4 below.

**Figure 4: Proportion of farmers who were growing strategic crop for the first time**

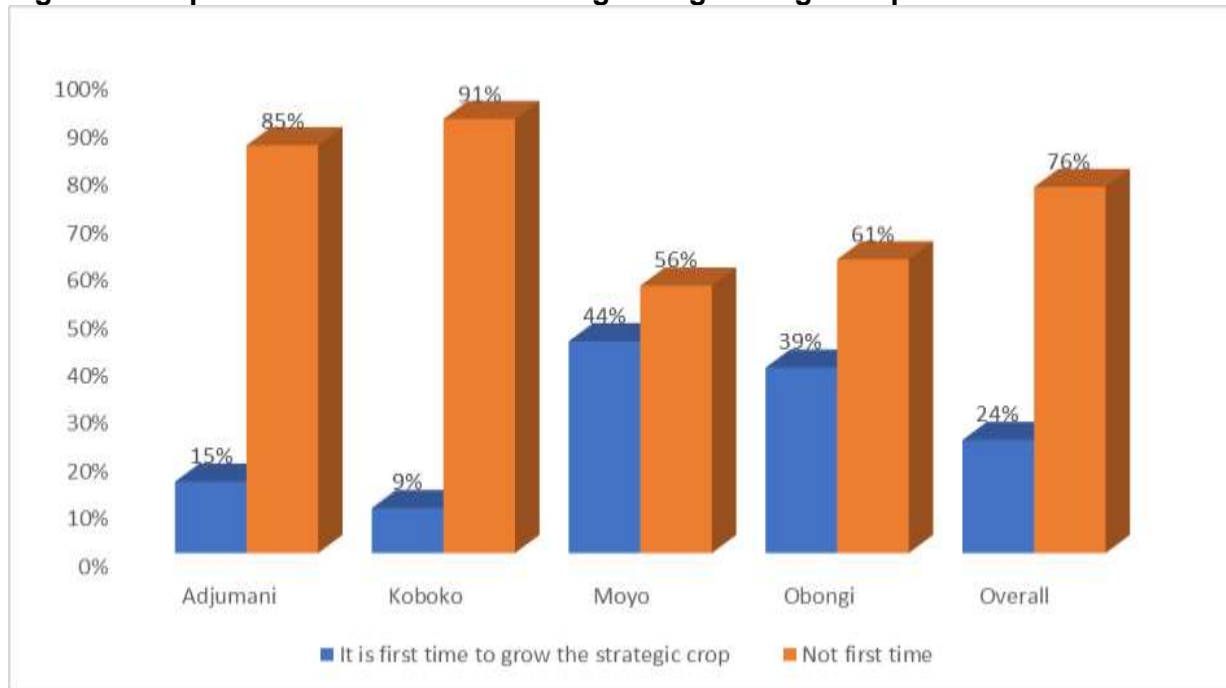
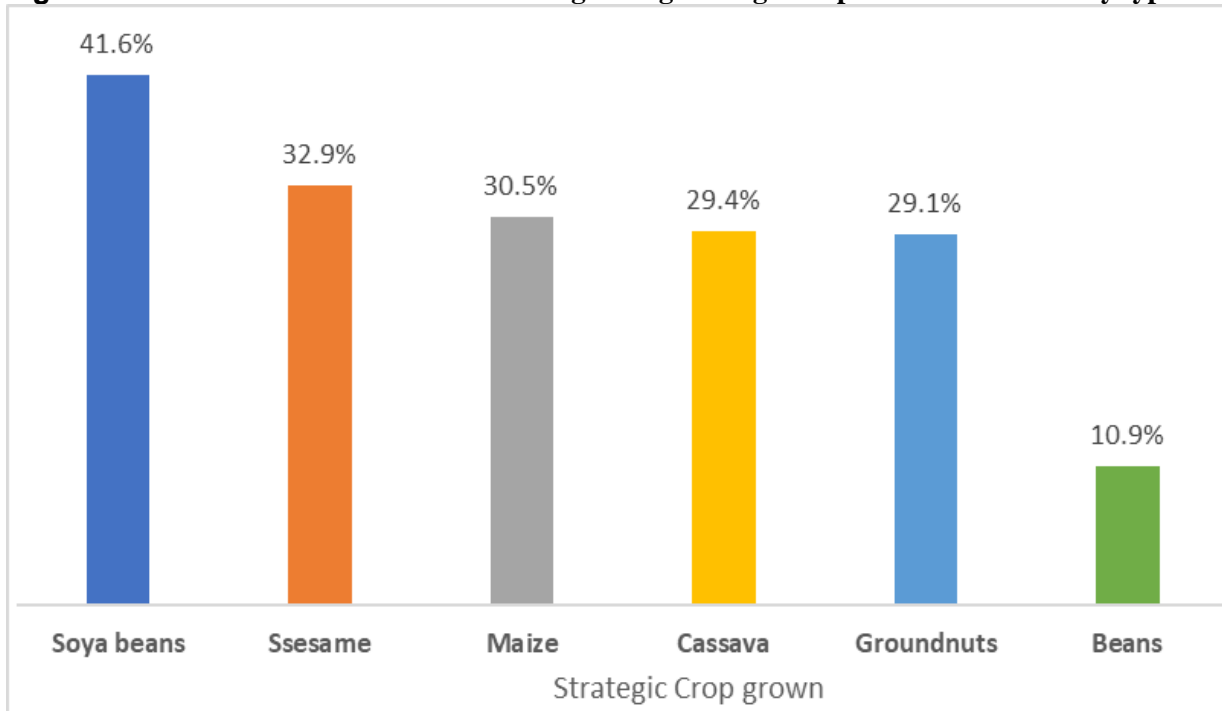


Figure 5 below shows that soyabeans (41.9%) was the most reported strategic crop that members of the New National Farmers group were growing for the first time. Almost the same proportion of farmers (about 30%) were growing the strategic crops namely Sesame, maize, cassava, and groundnuts for the first time. Only 10.4% of Farmers reported growing beans for the first time. The motivation to grow these strategic crops was due to the perceived ability of the crops to resist pests and diseases, their property of being drought resistance, the promise of a good harvest and availability of free seeds. Others were motivated to plant the strategic crops because of the perceived readily available market for those crops.

*We observed high yields from the same crops planted in the demo plot, they are quick maturing, resistant to pests and diseases, has high germination rate hence viable for production, has uniform growth (new national farmer group member).*



**Figure 5: Members in new national farmers growing strategic crops for the first time by type of crop**



### 2.4.1 Seed Bed Preparation

According to the results, 60% of the respondents reported that they either cut the shrubs or used slashing as a method to clear their fields before ploughing them in preparation for planting. Only 7.3% reported to burn or use chemicals to clear the bushes for ploughing. Nearly all members in the new national farmers groups who attended the CSA training were not using chemicals i.e., herbicides to spray the grass to dry and burn. The few farmers who used burning were mostly in Koboko (11%) and Adjumani (8.1%). Slashing as a method was more predominant in Koboko (95%) while most farmers (over 72%) in Adjumani, Moyo and Obongi districts used cutting of shrubs as the method for clearing land for ploughing.

Overall, the hand-hoe was the most used method/equipment (65%) to till the land in preparation for planting. Animal traction is the second most used method of land preparation (47.6%) in all the 4 districts. Animal traction was more dominant in Moyo district (64.9%) and Adjumani district (74.4%). Koboko district farmers hardly use animal traction (1%). Use of a tractor was nearly non-existent in all the four districts (2.8%). Only 6% of all respondents in Adjumani, Koboko (1.7%), Moyo (0.3%) and Obongi (0.5%) reportedly used the tractor to till their land. Regarding the number of times land was ploughed before planting, majority (81%) reported to have ploughed twice. Only 10.6% ploughed their land three times and 8.4% only a single time before they planted their strategic crop.

The study participants were able to recall from the sessions, elements of seed bed preparation including prohibition of burning fields as the most dominant element. About 90% of respondents recalled being told never to use burning as a method of clearing land before ploughing. Recall that burning of bushes was a bad seed bed preparation practice was nearly universal in Moyo and Obongi reported by 98.1% and 96.9% respectively compared to Adjumani (81.9%) and Koboko (89.8%). Other elements reportedly recalled by respondents included “*proper selection of site considering fertility, flood risk, topography, previous crop*” (71.9%), “*minimizing tree cutting*” and the importance of the “*first and second tillage*” (79.7% and 92.9% respectively). Over 64% of the respondents reportedly found some elements in the training that they did not know before the training. Koboko (81.2%) and Adjumani (67.6%) had the highest proportions of respondents who learnt something new about seed bed preparation practices. Moyo

and Obongi were associated with about half (50.4%) and slightly less than half (47.1%) of farmers who learnt some good seed bed preparation practices for the first time.

The study also made observation of the farmers' gardens to assess whether the elements of good seedbed preparation practices had been integrated on the farm. Results showed that about 89% of the respondents had evidence of good seedbed preparation practices on their farms. This implied that majority of the members of the new national farmers groups had adopted and were applying the practices learned on seedbed preparation. See Table 7 below for details on seedbed preparation.

**Table 7: Seedbed preparation practices recalled and observed on farm fields**

	ADJUMANI		KOBOKO		MOYO		OBONGI		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<b>Ways members of new national farmers groups cleared land</b>										
Burning field:	45	8.1%	40	11.0%	17	4.7%	6	3.1%	108	7.3%
Slashing:	80	14.4%	345	95.0%	70	19.2%	38	19.6%	533	36.1%
Cutting shrubs/trees:	430	77.6%	53	14.6%	265	72.6%	138	71.1%	886	60.0%
Spraying with herbicides:	2	0.4%	0	0.0%	9	2.5%	4	2.1%	15	1.0%
Others:	66	11.9%	2	0.6%	5	1.4%	0	0.0%	73	4.9%
<b>Method of land tillage used</b>										
Hoe:	343	61.9%	354	97.5%	133	36.4%	138	71.1%	968	65.6%
Animal traction:	412	74.4%	1	0.3%	237	64.9%	52	26.8%	702	47.6%
Tractor:	33	6.0%	6	1.7%	1	0.3%	1	0.5%	41	2.8%
Others:	0	0.0%	1	0.3%	1	0.3%	0	0.0%	2	0.1%
<b>Number of times ploughed field before planting strategic crop</b>										
Once	42	7.7%	33	9.2%	19	5.3%	28	14.7%	122	8.4%
Twice	432	78.7%	284	79.6%	320	88.9%	143	75.3%	1179	81.0%
Thrice	75	13.7%	40	11.2%	21	5.8%	19	10.0%	155	10.6%
<b>Elements of seedbed preparation recalled:</b>										
No burning of field	453	81.9%	325	89.8%	354	98.1%	186	96.9%	1318	89.8%
Proper selection of site considering fertility	339	61.4%	205	56.6%	338	93.4%	173	90.1%	1055	71.9%
Minimum soil disturbance	171	30.9%	213	58.8%	319	88.1%	176	91.7%	879	59.8%
Minimal tree cutting	364	65.8%	281	77.6%	341	94.2%	185	96.4%	1171	79.7%
First and second tillage	493	89.2%	337	93.1%	347	95.9%	187	97.4%	1364	92.9%
Good seedbed preparation	383	69.3%	332	92.0%	349	96.7%	183	95.3%	1247	85.0%
Farmers who found some new elements seedbed preparation in training	371	67.6%	289	81.2%	181	50.4%	89	47.1%	930	64.0%
Elements of good seedbed preparation were observed on the farm	472	87.7%	329	91.9%	297	88.1%	146	88.0%	1244	88.9%

## 2.4.2 Use of Improved Seeds

Reports from the farmers showed that nearly three quarters (71.8%) of the new national farmers were using local seeds of the strategic crops they grew prior to joining the NURI programme. Only 20.3% used improved seeds or both improved and local (7.9%). After joining NURI and benefiting from the CSA training conducted in 2020, widespread change was reported. Many farmers (79%) switched to using improved seed varieties leaving only 14.6% using local seeds. Comparison across districts shows significant proportion of farmers changed from local to improved seeds in Obongi (88.4%), Moyo (87.3%) and Koboko (82.4%). It was only in Adjumani where many farmers (28.2%) were still using local seeds. In all the other districts, local seeds were used by less than a tenth i.e., 3.4% in Moyo, 7.9% in Obongi and 8.7% in Koboko, in 2021.

The farmers' groups that planted improved seeds in 2021 had multiple sources of improved seed type. Majority of the respondents (83.3%) obtained them from a demonstration plot and/or markets (22%). Other reported sources of improved seeds included home saved seed (19%), input dealers (5.7%), other development partners (4.4%), and Operation Wealth Creation (OWC)(1.6%). Farmers in Moyo and Obongi used improved seeds obtained from demonstration plots almost exclusively (99.4% and 94.6% respectively). Farmers who used home saved seeds were from Adjumani (30.4%) and Koboko (20.1%). Equally notable proportions in the same districts of Adjumani and Koboko obtained the improved seeds from markets (32.8% and 33% respectively). Input dealers were not a popular source for improved seeds in all the four districts; results show that less than 10% of the farmers used improved seeds obtained from input dealers in the districts of Adjumani (8.9%), Koboko (7.8%), Obongi (3.6%) and Moyo (1%).

Overall, germination of the seeds from the various sources was rated highly with 55.4% and 37.5% of the respondents rating the germination as very good and good respectively. Farmers who rated seeds used as fair were only 6.3% and poor (0.8%). Majority of farmers who rated the germination of the seeds planted as "very good" were from Adjumani (65.4%) and Koboko (69.5%) districts. In Moyo and Obongi districts, majority (58% and 54.7% respectively) rated the germination as good. According to the farmers, the seeds have uniform germination, hence there is less need for gap filling compared with local seed varieties.

About recall of key elements to observe when using improved seeds, results show that farmers had a good recall of all the elements. The highest proportion of respondents recalled "*high yielding seeds*" (88.3%) and "*clean/pure/uniform in size and color*" (82.9%) as key elements concerning use of improved seeds, from the CSA training. Further, 78.6% recalled that improved seeds had an attribute of early maturing and/or uniform maturity. The other key elements recalled about use of improved seeds from the CSA training included "*Pest and disease resistant*" (74.7%), "*Drought tolerant*" (72.0%), "*Wholesomeness*" (71.3%) and "*Certified and viable*" (71.3%). Across the four districts, recall of the key elements was slightly lower among respondents from Adjumani (ranging between 53-80%) compared to Moyo and Adjumani district with minimum of 90.6% for all elements.

Most elements of improved seeds highlighted in the CSA training sessions were new to the farmers. More than half (64.9%) acknowledged that it was the first time they were learning about those elements. This means only a third (35.1%) had ever heard about the elements to observe when buying improved seeds. Efforts were made to establish whether farmers indeed used improved seed on their farms as they had reported. Visits were made to respondents' gardens where use of improved seeds was observed on 81.2%. Use of improved seeds was observed more on farms for respondents from Moyo (90.9%), followed by Obongi (88.3%) and Koboko (87.5%). The lowest was for members of farmers groups from Adjumani (68.5%). See Table 8 below.

**Table 8: Use of improved seed varieties among farmers that benefited from the CSA trainings**

	ADJUMANI		KOBOKO		MOYO		OBONGI		Total		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Seed type planted for strategic crop grown before joined NURI	Improved	123	23.4%	94	26.0%	52	14.4%	23	12.1%	292	20.3%
	Local	385	73.3%	248	68.5%	254	70.6%	145	76.3%	1032	71.8%
	Both	17	3.2%	20	5.5%	54	15.0%	22	11.6%	113	7.9%
Type of seed used this year 2021 after joining NURI	Improved	369	68.1%	294	82.4%	310	87.3%	168	88.4%	1141	79.0%
	Local	153	28.2%	31	8.7%	12	3.4%	15	7.9%	211	14.6%
	Both	20	3.7%	32	9.0%	33	9.3%	7	3.7%	92	6.4%
Reported sources of improved seed type used for planting this year											
Home saved	112	30.4%	59	20.1%	33	10.6%	13	7.7%	217	19.0%	
Market	121	32.8%	97	33.0%	17	5.5%	16	9.5%	251	22.0%	
Demonstration plot	227	61.5%	257	87.4%	308	99.4%	159	94.6%	951	83.3%	
Operation Wealth Creation (OWC)	0	0.0%	7	2.4%	8	2.6%	3	1.8%	18	1.6%	
Other development partners	30	8.1%	18	6.1%	2	0.6%	0	0.0%	50	4.4%	
Input dealer	33	8.9%	23	7.8%	3	1.0%	6	3.6%	65	5.7%	
Farmers' rating of the germination of seeds used	Very good	349	65.4%	246	69.5%	129	36.6%	63	34.8%	787	55.4%
	Good	142	26.6%	88	24.9%	204	58.0%	99	54.7%	533	37.5%
	Fair	40	7.5%	17	4.8%	18	5.1%	14	7.7%	89	6.3%
	Poor	3	0.6%	3	0.8%	1	0.3%	5	2.8%	12	0.8%
Key elements you recall about use of improved seeds from the CSA training											
Certified and viable	301	54.5%	227	62.7%	341	93.9%	179	93.2%	1048	71.3%	
Clean/pure/uniform in size and colour	379	68.7%	304	84.0%	354	97.5%	181	94.3%	1218	82.9%	
Wholesomeness	314	56.9%	204	56.4%	350	96.4%	179	93.2%	1047	71.3%	
Pest and disease resistant	326	59.0%	273	75.4%	328	90.4%	171	89.1%	1098	74.7%	
Drought tolerant	294	53.3%	249	68.8%	335	92.3%	180	93.8%	1058	72.0%	
Early maturing and/or uniform in maturity	345	62.4%	291	80.4%	342	94.2%	178	92.7%	1156	78.6%	
High yielding	438	79.6%	351	97.0%	329	90.6%	177	92.2%	1295	88.3%	
New element on use of improved seeds in the CSA training	343	63.2%	277	78.9%	207	58.6%	100	55.2%	927	64.9%	
Use of improved seeds observed on the farmers' field	370	68.5%	316	87.5%	311	90.9%	159	88.3%	1156	81.2%	

Motivation to plant improved seed varieties was drawn from their ability to tolerate drought, resist pests and diseases, early maturity, and high yields.

### 2.4.3 Planting Seeds

Prior to joining and attending the CSA training that was organized by extension staff of NURI, majority of farmers (61.3%) used the broadcasting method of plating and only 28.5% of the farmers used line planting. However, after the NURI CSA training, the proportion of farmers using line planting increased to 67.2% with a corresponding reduction among those using broadcasting method 27.6%.

At district level, majority of farmers in the districts of Adjumani (87.5%), Moyo (53,5%) and Obongi (70.5%) used the broadcasting method of planting prior to joining and attending the CSA training. Very few respondents in these districts (ranging between 9-27%) reported to have used line planting prior to enrolment onto the NURI programme. Over 60% of respondents in Koboko reportedly started to use line planting even before they joined the NURI programme. However, following the CSA training in 2021 by NURI staff, the practice significantly changed. Except for Adjumani, where slightly over half (58.2%) the farmers reported to still use the broadcasting methods, the practice of planting crops in lines has been adopted by increased proportion of farmers in the other 3 districts in 2021. The percent of respondents in Koboko, Moyo and Obongi districts who used line planting as the method of seed planting increased to 94.4%, 84.8%, and 77.4% respectively. This led the proportion of famers using broad casting method to reduce from 61.3% to 27.6% in 2021 in the 4 districts. Although the number of farmers using the broadcasting method is still high, the results demonstrate tremendous and steady progress in curbing poor agricultural production practices.

The results in table 10 below show that overall, among new national farmers that planted their crops in lines, the spacing commonly used between rows was 114 and 83 centimeters for cassava and maize respectively while spacing between plants was 117 and 85centimeters for the two crops respectively. Beans, groundnuts and soyabeans had an average spacing of 45-53 centimeters between rows. Sesame had the least spacing of 33.5 centimeters between the rows. The average spacing between plants for beans, groundnuts, soyabeans and sesame was almost the same, varying from 12.8 to 14.7 centimeters. The spacing between rows and plants did not vary much across districts for the different type of crop planted except in very few cases. Analysis results show notable deviation from the overall spacing between rows and plants was observed in Koboko district where casava had bigger spacing and maize had smaller spacing. The beans grown in the districts of Moyo and Obongi had wider spacing of 100 cm between rows and plants. Bigger average spacing between rows (75 cm) and plants (60 cm) for soyabeans than the overall was observed in Obongi district.

Like other CSA topics, several elements discussed under modern methods of planting seeds were new to most farmers (68.4%). Farmers who were learning about these methods for the first time were mostly in the districts of Adjumani (76.3%) and Koboko (81.5%). Only 53% and 50% of the respondents who learnt about these methods for the first time were in Moyo and Obongi districts. As earlier mentioned, only 32.4% of the farmers in Adjumani were observed to use line planting and correct spacing in the farms. Line planting and correct spacing was observed on 77% of the farmers' fields visited in Koboko, Moyo and Obongi districts. Adoption of intercropping was generally low and was observed on only 25.4% of farmers' fields visited (see Table 9 below).

Where line spacing was observed farmers explained, they adopted the practice because it makes weeding easy and reduces damage or loss of crops during weeding.

*It makes it easy to weed, reduces cost of weeding, easy to control pests and diseases. Estimation of the plant/crops you have in the garden becomes possible. If you are going to spray, it makes movement around the garden easy. Even harvesting becomes easy (new national farmer group member).*

Farmers who did not use line spacing argued that it is time consuming as opposed to the broadcasting method, and some claim not to have realized any difference in yields.

**Table 9: Reported methods of planting seeds and weeding prior and after start of the NURI programme**

		ADJUMANI		KOBOKO		MOYO		OBONGI		Total	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Planting methods farmers used before before enrolling for NURI CSA training	Line planting	48	9.2%	218	60.7%	98	27.3%	45	23.3%	409	28.5%
	Broad casting	456	87.4%	95	26.5%	192	53.5%	136	70.5%	879	61.3%
	Both	18	3.4%	46	12.8%	69	19.2%	12	6.2%	145	10.1%
Method of seed planting used this year-2021	Line planting	189	34.6%	335	94.4%	302	84.8%	147	77.4%	973	67.2%
	Broad casting	318	58.2%	17	4.8%	29	8.1%	35	18.4%	399	27.6%
	Both	39	7.1%	3	0.8%	25	7.0%	8	4.2%	75	5.2%
<b>Key elements on planting of seed recalled from the CSA training</b>											
Planting in lines		535	96.7%	358	98.9%	356	98.3%	184	96.3%	1433	97.6%
Correct spacing		420	75.9%	341	94.2%	343	94.8%	177	92.7%	1281	87.3%
Recommended Intercropping		178	32.2%	195	54.3%	334	92.8%	171	90.0%	878	60.1%
Farmers that learnt new things about proper planting		403	76.3%	290	81.5%	188	53.1%	94	50.0%	975	68.4%
Farms where line planting and correct spacing was observed		176	32.4%	275	77.2%	259	78.2%	136	77.7%	846	60.2%
Farms where the recommended intercropping was observed		51	9.5%	98	27.2%	163	46.3%	53	28.2%	365	25.4%
% of farmers that weeded their gardens this season		533	97.1%	312	87.2%	346	96.1%	181	94.8%	1372	94.1%
Number of times farmers weeded their crops this season	1	278	52.5%	182	58.7%	51	15.1%	63	35.2%	574	42.3%
	2	228	43.0%	111	35.8%	251	74.3%	85	47.5%	675	49.7%
	3+	24	4.5%	17	5.5%	36	10.7%	31	17.3%	108	8.0%
<b>Methods of weeding used by farmers in their gardens</b>											
Hand hoe (Mechanical)		511	95.0%	300	94.0%	345	98.6%	175	95.1%	1331	95.7%
Chemical		0	0.0%	2	0.6%	1	0.3%	0	0.0%	3	0.2%
Number of times were you weeding your field before enrolling for CSA training	Once	282	54.5%	197	55.6%	113	32.0%	56	30.6%	648	46.1%
	Twice	199	38.5%	135	38.1%	186	52.7%	82	44.8%	602	42.8%
	Thrice	19	3.7%	16	4.5%	54	15.3%	17	9.3%	106	7.5%
	None	17	3.3%	6	1.7%	0	0.0%	28	15.3%	51	3.6%
First weeding was completed		536	99.6%	312	87.9%	342	98.3%	182	97.3%	1372	96.1%
Period when first weeding was done	1-2	230	42.9%	149	47.0%	252	72.6%	94	51.9%	725	52.5%
	3-4	293	54.7%	163	51.4%	91	26.2%	85	47.0%	632	45.8%
	5+	13	2.4%	5	1.6%	4	1.2%	2	1.1%	24	1.7%
Second weeding was completed		246	60.1%	129	36.9%	284	88.8%	120	74.1%	779	62.8%
Weeding done in your field after planting your crop this season: Period when first weeding was done	1-2	10	3.8%	16	11.0%	48	15.9%	19	15.3%	93	11.2%
	3-4	134	51.3%	73	50.3%	193	63.9%	63	50.8%	463	55.6%
	5+	117	44.8%	56	38.6%	61	20.2%	42	33.9%	276	33.2%
<b>Recall key elements about weeding of your fields from the CSA training attended under NURI</b>											
Timely weeding		535	96.6%	356	98.3%	356	98.6%	179	93.7%	1426	97.1%
Application of alternative measures		349	63.5%	243	67.1%	341	94.5%	165	86.4%	1098	75.0%
Combination of method		169	31.1%	198	54.8%	324	89.8%	163	85.3%	854	58.7%
Element under weed control during CSA training that was new		283	52.3%	227	63.6%	185	52.0%	92	48.7%	787	54.5%
Correct weeding can be observed in the fields		347	66.6%	283	78.4%	257	73.0%	130	71.4%	1017	71.8%

**Table 10:** Average Spacing (in cm) between rows and plats for different strategic crops in 2021

Strategic crop	Adjumani				Koboko				Moyo				Obongi				Total			
	Rows		Plants		Rows		Plants		Rows		Plants		Rows		Plants		Rows		Plants	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
BEANS					75	49.4	75	10.2	1	100.0	1	100.0	1	100.0	1	100.0	77	50.7	77	12.5
CASSAVA					18	197.2	18	200.0	94	110.1	94	115.5	39	85.7	39	84.3	151	114.2	151	117.5
GROUNDNUTS					160	45.0	160	11.0	187	45.6	187	16.7	2	37.5	2	22.5	349	45.3	349	14.1
MAIZE	4	61.3	3	53.3	31	74.2	31	55.2	5	80.0	5	76.0	19	85.5	19	78.9	59	85.1	58	83.4
SESSAME	51	32.2	44	14.4									80	34.3	80	14.9	131	33.5	124	14.7
SOYABEANS	119	51.8	108	11.9					15	60.0	15	16.3	1	75.0	1	60.0	135	52.9	124	12.8



#### 2.4.4 Weeding as a Farming Practice

Weeding/removal of unwanted plants from the field, was done by 94.1% of all members of farmers groups that participated in the adoption study. Only 5.9% did not weed their fields this season. Those who did, either removed the unwanted plants once or twice; less than a tenth (8%) reported to have weeded their fields three or more times during the season. The practice on number of times fields are weeded has not changed, even prior to joining NURI most of fields were cleared once (46.1%) or twice (42.8%). The hand-hoe was the most used tool in the weeding. Of all farmers that reported to have weeded their fields, 95.7% used the hand-hoe. Only three (3) farmers including two (2) in Koboko district and one (1) in Moyo district reported to have used chemicals to kill the weeds in their fields in the just concluded planting season.

During the training, farmers were taught about timely weeding, application of alternative measures and use of a combination of methods. Thus, participants in the adoption study were asked to mention the weeding control measures they recalled. Based on the results, recall of weeding control measures was highest for “*timely weeding*” (97.1%) followed by “*application of alternative measures*” (75%). Use of a combination of methods was mentioned by a smaller proportion (58.7%) compared with the other two. During field observations, adoption of correct weeding was found on 71.8% of the farmers’ fields. Slightly over 28% of farmers that reported to have practiced weeding were not using the recommended weeding control measures. These results are presented in detail in Table 9 above.

Correct weeding practices were observed mostly among farmers who were growing Soyabeans (89.8%), beans (80.9%), maize (78.8%), cassava (76.3%), and groundnuts (75.1%) as opposed to those growing Sesame (60.3%). Nearly all the farmers had completed the first weeding for all crops while the highest proportion of the farmers that had completed the second weeding was 86.5% for Cassava. For other crops like Sesame, and groundnuts, only about 50% had completed second weeding (see Table 11 below).

**Table 11: Methods of weeding, farmer fields with observed correct weeding by strategic crop**

Strategic crop	Method of weeding used				Weeding done after planting the crop				Correct weeding observed	
	Hand hoe (Mechanical)		Chemical		First Weeding		Second weeding			
	HHs	Percent	HHs	Percent	HHs	Percent	HHs	Percent	HHs	Percent
SOYABEANS	161	98.8%	0	0.0%	163	98.8%	120	77.9%	141	89.8%
SESAME	469	93.4%	0	0.0%	501	99.4%	193	53.0%	297	60.3%
MAIZE	80	97.6%	0	0.0%	80	96.4%	55	71.4%	63	78.8%
GROUNDNUTS	394	97.8%	2	0.5%	393	91.2%	215	51.4%	325	75.1%
CASSAVA	180	97.8%	0	0.0%	179	96.2%	147	86.5%	142	76.3%
BEANS	82	87.2%	1	1.1%	93	97.9%	72	77.4%	76	80.9%

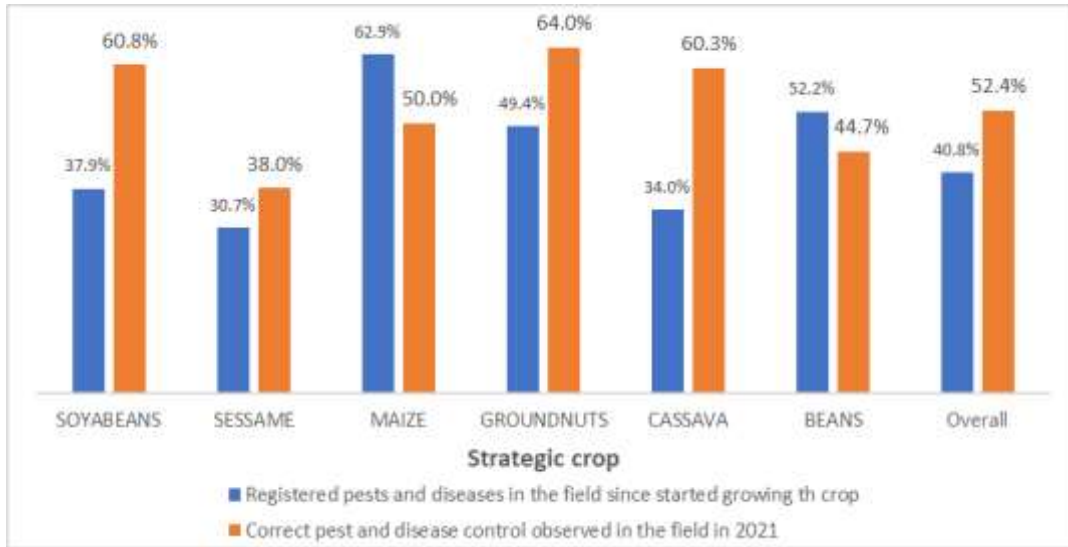
#### 2.4.5 Pest and Disease Control

In the entire sample, less than half (41%) of the new national farmers affirmed to have had an incidence of pest and diseases on their fields and 52% had correct control measures in their fields. The highest proportion of farmers who registered pests and diseases in their fields were growing maize (62.9%), beans (52.2%) and groundnuts (49.4%) in 2021. For other strategic crops included soyabeans, Sesame, and cassava, only about 30% of the farmers registered pests and diseases on their fields. Correct pest and disease control measures were mostly observed in fields for famers growing groundnuts (64.0%), soyabeans (60.8%) and maize (50.0%) (see Figure 6 below ).

Koboko district had the highest proportion of farmers who experienced pests and diseases (51.5%) while the least diseases incidence was found in Obongi district (28.3%) (see Table 12 below). The commonly reported diseases included groundnut mosaic, and cassava brown streak while the commonly observed

pests included the army fall worm, rats, grasshoppers, beetles, wild birds, and rabbits, that eat plant shoots of seedlings, and termites. To control the pests, farmers adopted various measures including spraying pesticides such as “Rocket” or ash, , digging up the anti-hills, weeding fields early and clearing bushes around gardens, using a mixture of sand and tobacco leaves to deter insects and using traps to keep rodents out of the fields. For the diseased crops, uprooting and burning was done.

**Figure 6: Strategic crops where pests and diseases were registered**



Results show that 82.8% of the new national farmers recalled that chemicals should be used only as a last resort. While 79% of the farmers recalled use of cultural methods such as crop rotation and fallowing, 75.3% mentioned organic methods and 57.7% recalled that a farmer could use a combination of methods. Slightly over 62% found the issues discussed under pests and disease management new to them. This means only 37.7% had ever been trained on ways to manage pests and diseases in fields. No significant variation of this proportion was found across the 4 districts. Indeed, during field observations, correct pest and disease control measures were observed on about half the farmers’ fields visited (52.1%). Thus, nearly half (47.9%) of the farmers were not using the correct pests and disease control measures as had been guided during the CSA training. Most of these farmers’ fields were found in Adjumani (60%) and Koboko (50.6%) (See Table 12 below).

**Table 12: Pests and disease control among beneficiaries of the CSA training**

		ADJUMANI		KOBOKO		MOYO		OBONGI		Total	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Ever registered any pests and diseases in your field since started growing crop	Yes	215	39.5%	184	51.5%	146	40.7%	53	28.3%	598	41.3%
	No	329	60.5%	173	48.5%	213	59.3%	134	71.7%	849	58.7%
Key elements recalled about pest and disease management from the CSA training											
Cultural methods like crop rotation, fallowing		343	62.4%	277	76.5%	355	98.3%	180	95.2%	1155	79.0%
Use of organic methods like tobacco, soap, chilly		372	67.5%	211	58.4%	344	95.3%	174	92.1%	1101	75.3%
Chemical control as a last resort		392	71.3%	305	84.5%	335	92.8%	177	93.7%	1209	82.8%
Use of a combination of methods		145	26.4%	212	59.2%	319	89.4%	164	85.9%	840	57.7%
Learnt new element under pests and disease management session		326	62.5%	241	67.9%	203	58.0%	105	59.0%	875	62.3%
Correct pest and disease control observed in the farmer's field		214	40.0%	178	49.4%	247	70.6%	104	57.5%	743	52.1%

#### **2.4.6 Soil Fertility and Water Management**

Majority of members of the new national farmers groups visited during the adoption study were satisfied with the fertility of the soil in the fields, rating the soil fertility as good (51.6%) or very good (33.8%). Thus only 14.5% of the farmers were not happy with the fertility of their soils, rating their state of fertility as only fairly fertile (7.2%), poor (1.2%) and very poor/infertile (6.1%). For many farmers in the 4 districts, the soils have always been fertile. Results show that more than 3 in 5 respondents (61.5%) mostly in Obongi (77.4%), Moyo (62.5%), and Koboko (62.8%) reported that they had not experienced any soil fertility and water management related challenges in their fields even before they joined NURI. It was mostly farmers in Adjumani (45.5%) who acknowledged that they had soil fertility and water management challenges before joining NURI. (See Table 13).

On the recall elements of soil fertility and water management covered during the CSA training, more than half of respondents reportedly remembered being taught about mulching, use of cover crops, inoculation of legumes with rhizobia, crop rotation, constructing terraces, bands, trenches, fallowing of land, as well as application of manures and inorganic fertilizers. Among these, the element recalled most was mulching of soils (90.2%), construction of terraces/bands/trenches (81.3%), application of manures (78%) and crop rotation (73.6%). Inoculation of legumes with rhizobia was the least remembered as a method for conserving soil fertility (39.7%). Variations across districts were evident on different elements of soil fertility. The proportions of farmers who recalled different elements of soil fertility were higher (ranging from 86% to 90%) in the districts of Moyo and Obongi than in Koboko and Adjumani districts (ranging from 20% to 93% and 4% to 85% respectively). Generally, recalling of these elements was lower in Adjumani compared with the other three (3) districts. A high percentage (68.3%) of the respondents reported that there were elements of soil fertility taught in the CSA sessions under management of soil fertility and water that were new to them.

Adoption of measures for ensuring good soil fertility and water management was generally good (77.1%) as observed in the farmers' fields visited. Across all the 4 districts, there was no significant variation in proportion of farmers who adopted good soil fertility and water management practices (ranging from 73.9% to 81.6%). See Table 13.

**Table 13: Soil fertility and water management practices as observed on farmers' fields**

		ADJUMANI		KOBOKO		MOYO		OBONGI		Total	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Farmers' rating of fertility of the soils in their fields	Very poor	51	9.2%	10	2.8%	27	7.6%	1	0.5%	89	6.1%
	Poor	11	2.0%	3	0.8%	1	0.3%	3	1.6%	18	1.2%
	Fair	40	7.2%	38	10.5%	18	5.0%	10	5.2%	106	7.2%
	Good	219	39.6%	174	48.2%	236	66.1%	126	65.6%	755	51.6%
	Very good	232	42.0%	136	37.7%	75	21.0%	52	27.1%	495	33.8%
Experienced soil fertility & water management challenges	Yes	252	45.5%	135	37.2%	135	37.5%	43	22.6%	565	38.5%
	No	302	54.5%	228	62.8%	225	62.5%	147	77.4%	902	61.5%
Key elements recalled about soil fertility and water management from training											
	Mulching	468	84.6%	323	89.2%	353	97.8%	178	93.7%	1322	90.2%
	Use of cover crops	232	41.9%	244	67.4%	339	93.9%	178	93.7%	993	67.7%
	Inoculation of legumes with rhizobia	23	4.2%	73	20.2%	322	89.2%	164	86.3%	582	39.7%
	Crop rotation	285	51.4%	286	79.0%	334	92.5%	175	92.1%	1080	73.6%
	Constructing terraces, bands, trenches	401	72.4%	284	78.5%	336	93.1%	172	90.5%	1193	81.3%
	Fallowing of land	267	48.3%	199	55.3%	326	90.3%	175	92.1%	967	66.1%
	Application of manures	300	54.3%	335	92.5%	332	92.0%	176	92.6%	1143	78.0%
	Application of inorganic fertilizers	125	22.7%	230	63.5%	311	86.1%	166	87.4%	832	56.9%
New elements under soil fertility and water management learnt during the training		357	65.6%	301	84.6%	212	60.4%	110	59.8%	980	68.3%
Efforts to conserve soil fertility observed in the farmers' fields		403	73.9%	278	77.7%	275	81.6%	139	76.8%	1095	77.1%

For all the strategic crops planted, none had more than 46% of farmers complaining about soil fertility and water management challenges. The highest proportion of farmers' fields with correct soil fertility and water management measures was observed among growers of Soyabeans (90.5%) while the least was observed among Sesame growers' fields (69.4%). About 80% of growers of Maize, Groundnuts, Cassava and Beans were found with correct soil fertility and water management measures in their fields. See Table 14 below.

**Table 14: Farmers' rating of soil fertility by type of strategic crop grown in 2021**

		SOYABEANS		SESAME		RICE		MAIZE		GROUNDNUTS		CASSAVA		BEANS	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
Rate for the fertility of the soil in the field	Very poor	14	9.5%	35	7.8%	0	0.0%	2	3.1%	14	3.4%	14	8.9%	4	4.3%
	Poor	0	0.0%	8	1.8%	0	0.0%	0	0.0%	2	0.5%	0	0.0%	1	1.1%
	Fair	3	2.0%	19	4.3%	0	0.0%	3	4.6%	38	9.2%	8	5.1%	13	13.8%
	Good	65	44.2%	224	50.1%	0	0.0%	34	52.3%	243	59.0%	92	58.2%	34	36.2%
	Very Good	65	44.2%	161	36.0%	0	0.0%	26	40.0%	115	27.9%	44	27.8%	42	44.7%
Experienced soil fertility & water management challenges before training under NURI		57	39.0%	150	33.6%	0	0.0%	25	38.5%	157	38.1%	52	32.7%	43	45.7%
Farmers that found new elements in training on soil fertility and water management		111	78.7%	248	56.8%	0	0.0%	42	65.6%	298	73.4%	106	70.2%	78	83.9%
Soil fertility management observed in the field		133	90.5%	304	69.4%	0	0.0%	48	76.2%	320	80.8%	116	76.3%	73	78.5%

#### **2.4.7 Post Harvest Handling, Value Addition and Marketing of Produce**

Nearly three quarters (72.7%) of members of the new national farmers groups covered in the adoption study applied some post-harvest handling (PHH) measures during and after harvesting their crops cultivated in planting season B of 2020. Only 27.3% of farmers, mostly from Moyo (40.2%) and Obongi (35.3%) did not apply any post-harvest handling measures. The PHH measures applied ranged from harvesting only the matured crops, use of improved methods of drying produce, use of constructed drying platforms and threshing on tarpaulins. Several farmers also reported to have sorted and graded their grain, cleaned the grain to remove soil, packed the dried grain in clean bags and kept them in leak proof stores.

The level of recall on the topic of PHH was very high. Results show recall of above 75% on almost all aspects of post-harvest handling. Farmers correctly recalled being told about the indicators of crop maturity, causes of PHH losses, the various methods to use in harvesting, threshing/shelling, proper drying, cleaning the harvested crops, and how to grade/sort and store crop produce. 75.2% recalled being told about pests that attack produce in storage and how they can be controlled, while 79.5% recalled having studied the importance of having a clean store with good, leak-proof roof.

With regard to carrying out value addition to farmers' crops before marketing or storage, results reveal a low rate of adoption of the new practice. Only 31.3% of all members of the new national farmers groups reported to have added value to their produce before marketing it or storage. It was mostly farmers from Koboko (92%) that sold their produce without adding any value. In Adjumani, value addition was carried out by only 26.8%, thus 73.2% sold their produce without adding any value. It was generally in the districts of Obongi and Moyo where notable proportions of members of the farmers groups carried out value addition before marketing or storage, reported by 61.8% and 52.4% respectively.

Results on marketing of crop produce revealed a quite low level of collective marketing with variations across districts. Whereas some farmers (46.4%) adopted the practice of selling produce collectively as a group, a higher proportion of members (53.6%) continued to sell their produce individually. Adoption of collective crop marketing varied across the 4 districts. While only 19.7% of farmers in Moyo and 31.2% in Obongi collectively marketed their produce in 2020, a higher proportion of farmers in Koboko (66.4%) and Adjumani (55.8%) districts notably adopted the practice of marketing collectively in 2020. See Table 15.

Some explanations given for selling individually as opposed to collectively are given below.

*Our production is low, a small quantity of produce does not require marketing collectively. Quantity produced was small, it would be wasting time to call bulk buyers. I had no people to pool my produce with (new national farmer group member).*

Soyabeans, one of the most sold crops, generated highest amount of money for its farmers; the mean value of Soyabeans sold by farmers was Ugx 324,682/= per HH. Groundnuts was sold by the highest number of HHs (205) and it earned its growers a mean value of Ugx. 307,278/=. Maize attracted the lowest value, sold by 46 HHs at a mean value of Ugx. 208,588/=. Overall, the mean value of crops sold varied by district, dependent on quantity sold. For instance, the mean value earned from beans sold by one HH in Moyo was UGx 600,000/= compared to UGx 241,607/= from sales of 58 HHs (See Table 16 below).

**Table 15: Application of post handling measures, value addition and marketing of produce**

		ADJUMANI		KOBOKO		MOYO		OBONGI		Total	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Applied some post-harvest handling measures during and after harvesting	Yes	383	73.1%	305	85.9%	171	59.8%	97	64.7%	956	72.7%
	No	141	26.9%	50	14.1%	115	40.2%	53	35.3%	359	27.3%
Major elements of post-harvest handling recalled from the CSA training											
	Indicators of crop maturity	403	73.1%	245	67.9%	355	98.3%	182	95.8%	1185	81.0%
	Causes of PHH losses	253	46.2%	231	63.8%	347	96.1%	178	93.7%	1009	69.1%
	Methods of harvesting	359	65.0%	288	79.6%	348	96.4%	182	95.8%	1177	80.3%
	Threshing/shelling	316	57.4%	290	80.6%	333	92.2%	178	93.7%	1117	76.4%
	Proper drying	498	90.1%	349	96.4%	346	95.8%	176	92.6%	1369	93.4%
	Cleaning	456	82.5%	339	93.6%	337	93.4%	179	94.2%	1311	89.4%
	Grading/sorting (stacked on pallets or raised stones)	300	54.7%	299	82.6%	335	92.8%	170	89.5%	1104	75.6%
	Storing of produce and methods	392	71.0%	304	84.0%	334	92.5%	171	90.0%	1201	82.0%
	Storage pests and their control	313	56.7%	282	78.6%	333	92.2%	172	90.5%	1100	75.2%
	Clean store or none leaking roof	358	65.1%	302	83.7%	329	91.1%	173	91.1%	1162	79.5%
Carried out value addition to crops before marketing or storing		141	26.8%	29	8.0%	152	52.4%	94	61.8%	416	31.3%
Elements under PHH during the CSA training that was new		258	50.8%	198	56.7%	120	35.0%	72	40.2%	648	47.0%
Ways of marketing the produce in 2020	Collectively	296	55.8%	235	66.4%	68	19.7%	59	31.2%	658	46.4%
	Individually	234	44.2%	119	33.6%	278	80.3%	130	68.8%	761	53.6%

**Table 16: Mean value of produce/strategic crops marketed per district in 2020**

	ADJUMANI		KOBOKO		MOYO		OBONGI		Total	
	HHs	Mean	HHs	Mean	HHs	Mean	HHs	Mean	HHs	Mean
Soyabean	80	333,538	2	98,300	1	69,000			83	324,682
Sesame	214	230,194					40	264,475	254	235,593
Maize	2	110,000	24	210,961	12	256,833	8	153,750	46	208,588
Beans	2	259,500	58	241,607	1	600,000			61	248,069
Groundnuts			155	268,658	50	427,002			205	307,278
Cassava			1	136,000	4	495,000	8	159,875	13	261,154
<b>Total</b>	<b>298</b>	<b>257,327</b>	<b>240</b>	<b>254,378</b>	<b>68</b>	<b>398,251</b>	<b>56</b>	<b>233,714</b>	<b>662</b>	<b>268,736</b>



**Table 17:** Proportion of new national households that marketed produce collectively by type of crops

Strategic crop	ADJUMANI		KOBOKO		MOYO		OBONGI		Total	
	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
SOYABEANS	79	60.8%	0	0.0%	3	16.7%	1	100.0%	83	55.7%
SESAME	136	55.5%	1	100.0%	1	100.0%	14	21.9%	152	48.9%
RICE	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
MAIZE	6	50.0%	23	74.2%	7	53.8%	9	33.3%	45	54.2%
GNUTS	0	0.0%	159	74.0%	57	27.4%	1	33.3%	217	50.9%
CASSAVA	0	0.0%	1	5.3%	10	8.7%	12	25.0%	23	12.6%
BEANS	0	0.0%	53	60.2%	1	50.0%	0	0.0%	54	59.3%

## 2.4.8 Land access and yield for strategic crops

As earlier noted, the new national farmer groups were trained and supported to cultivate the following strategic crops; Soyabeans, Sesame, Maize, Groundnuts, Cassava and Beans. NURI trains each farmer group on only one strategic crop however a farmer is at liberty to do more than one on his or her own capacity.

Among all strategic crops promoted, sesame was the most selected crop in 2020 (587 HHs) , followed by groundnuts (379 HHs) and maize was the least selected by only 87 HHs in a sample of 1,476 respondents. Sesame on average was planted on 0.8 acres of land, used on average 6.7kgs of seed per acre, and harvested 177.4 kgs/acre. Sesame farmers in Obongi district obtained higher yields per acre (190.7kgs/acre) than their colleagues in Adjumani (175.6kgs/acre) and Moyo (46.3kgs/acre). For Groundnuts, most farmers cultivated an average 0.9 acres, harvested 472 kgs/acre. Groundnuts growers in Moyo reported the highest yields/acre when compared to their colleagues in Koboko and Obongi district. Maize growers were fewer but got higher harvests than Sesame; with 0.8 of an acre cultivated, they harvested an average of 427.7kgs/acre compared to the 185.7kgs/acre for Sesame. Cassava was grown by a reasonable number of farmers compared to other crops in the 3 districts of Moyo, Obongi and Koboko. Farmers in Adjumani did not grow cassava as a strategic crop. It was cultivated on the largest land of 3.7 acres and had the highest yield of 968 kgs per acre. Cassava had the highest proportion (77.4%) of harvest marketed by the farmers. See Table 17 below.

**Table 18: Quantity of strategic crops planted, harvested, consumed and marketed in 2020**

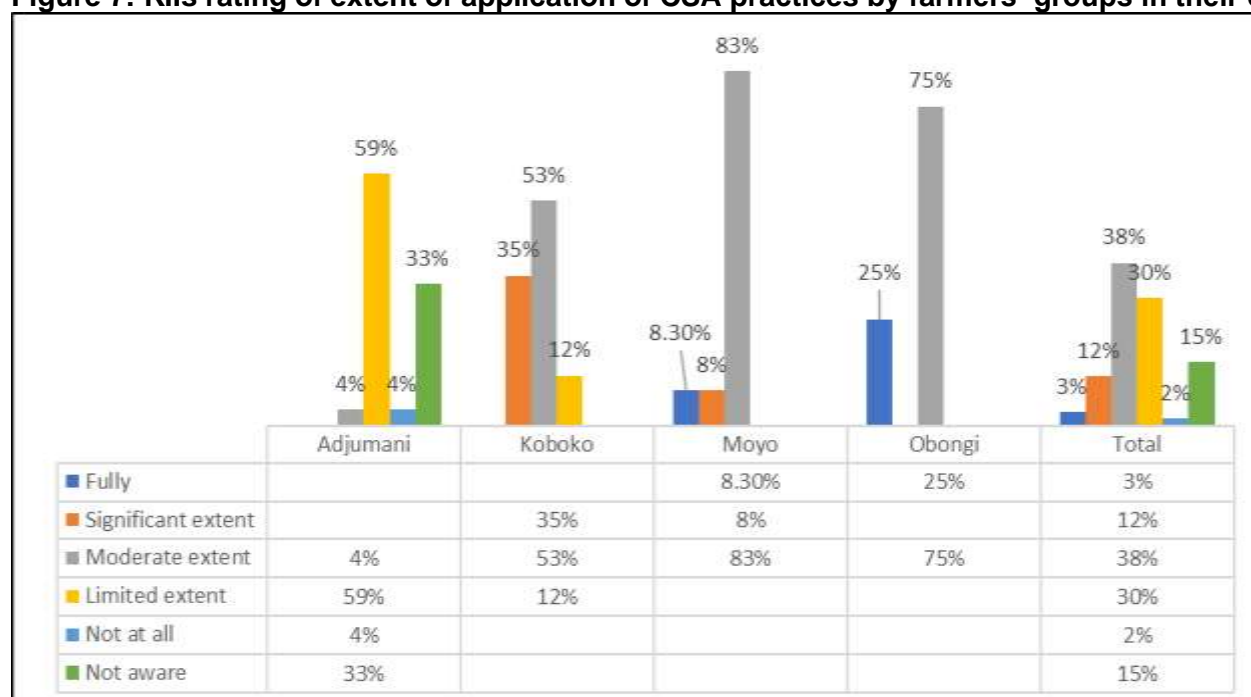
District	Crop	Land size (in acres)		Quantity of seed used PER ACRE		YIELD PER ACRE (kgs/acre)		%age of harvest sold		%age of harvest consumed	
		HHs	Mean	HHs	Mean	HHs	Mean	HHs	Mean	HHs	Mean
ADJUMANI	Maize	11	1.6	12	6.6	11	133.1	6	50.0	11	72.7
	Sesame	508	0.8	507	6.4	304	175.6	219	55.0	301	59.6
	Soyabean	133	0.8	133	15.4	93	373.4	84	73.8	62	33.7
KOBOKO	Beans	109	0.5	109	17.9	99	379.1	57	53.1	76	41.9
	Cassava	23	15.9	20	188.2	2	714.0	1	50.0	1	50.0
	Groundnuts	245	1.0	245	24.8	202	402.0	160	59.1	161	31.9
	Maize	34	0.5	34	5.1	29	624.2	23	60.8	27	45.6
MOYO	Beans	2	1.3	2	30.0	2	126.7	1	75.0	2	37.5
	Cassava	80	0.9	80	176.3	9	756.5	7	62.3	6	27.5
	Groundnuts	131	0.7	130	18.2	123	590.2	54	44.1	91	49.8
	Maize	22	0.9	22	32.1	19	372.3	13	51.4	15	57.2
	Soyabean	10	0.4	10	5.1	9	402.7	1	60.0	5	70.3
OBONGI	Cassava	21	1.1	19	82.9	7	1312.6	7	96.4	1	16.7
	Groundnuts	3	0.5	3	31.3	3	336.7		0.0	2	83.3
	Maize	20	0.7	21	11.4	18	349.5	14	50.5	18	54.8
	Sesame	77	0.9	76	8.3	61	190.7	46	59.1	39	42.0
Overall	Beans	111	0.5	111	18.1	101	374.1	58	53.5	78	41.8
	Cassava	124	3.7	119	163.4	18	968.0	15	77.4	8	29.0
	Groundnuts	379	0.9	378	22.6	328	472.0	214	55.3	254	38.7
	Maize	87	0.8	89	13.5	77	427.7	56	54.9	71	54.6
	Sesame	587	0.8	585	6.7	367	177.4	266	55.7	342	57.7
	Soyabean	143	0.8	143	14.7	102	375.9	85	73.7	67	36.4

Analysis of the mean quantity of harvest consumed per HH revealed that Sesame was the most consumed in the Northwest Nile districts. On average each Household among those that planted Sesame in 2020, they consumed 57.7% of the harvest. This is followed by Maize consumed by a mean of 54.6% per HH. Groundnuts and cassava were the least consumed with a mean quantity consumed standing at 38.7% and 29% of harvest respectively. Similar analysis on mean quantity of harvest sold per HH revealed that

cassava was the most sold crop in the Northwest Nile districts. On average among the HH that planted cassava in 2020, each HH sold 77.4% of the harvest. This is followed by soyabeans where mean quantity sold was 73.7% per HH. Beans and maize were the least sold, the mean quantity sold was 53.5% of all beans harvested and 54.9% of Sesame (see Table 16above).

During the study KIIs that monitored delivery of the CSA trainings validated efforts of applying the knowledge and skills gained from the CSA trainings in their respective districts. Overall, the results show that 38.3% of the KIIs found the application of the CSA practices was moderate and 30% of them reported limited application of the practices. While about 60% of the KIIs in Adjumani reported limited application of the practices by the farmers, majority of the KIIs observed moderate application of the same practices in the districts of Koboko (53%), Moyo (83%) and Obongi (75%). Twenty five percent (25%) of KIIs in Obongi said that the practices were fully applied in their district and 33% of KIIs in Adjumani were not aware of any farmer that had applied the new practices learnt during CSA training. See the figure 7 below.

**Figure 7: KIIs rating of extent of application of CSA practices by farmers' groups in their districts**



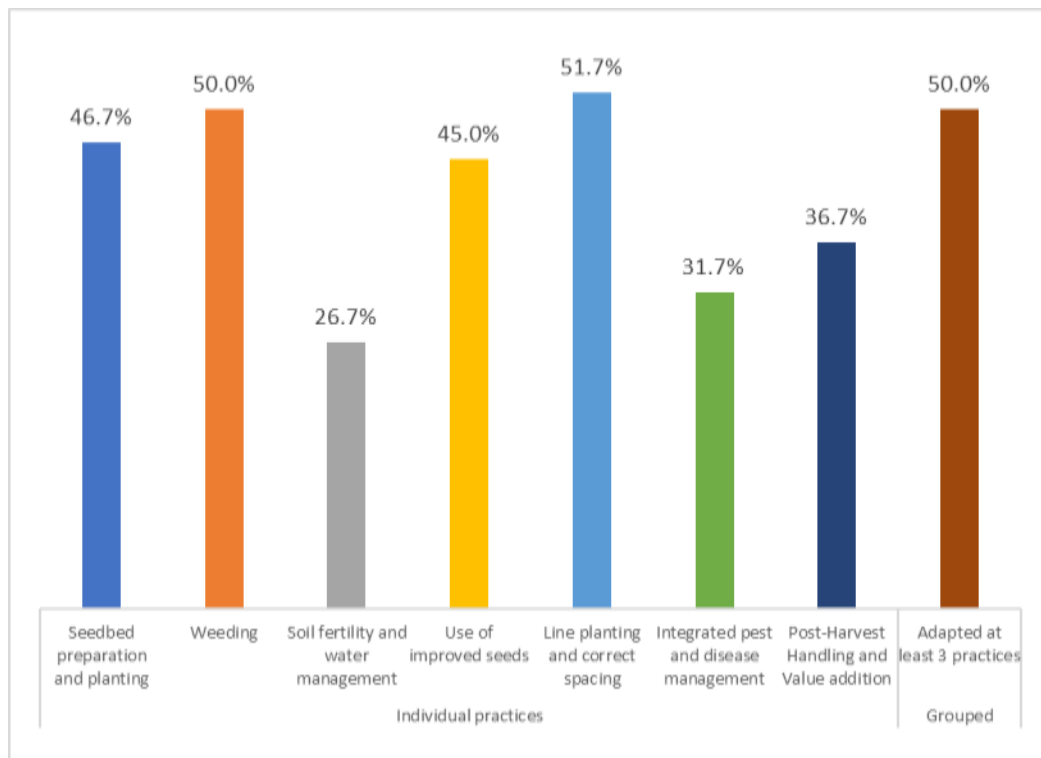
#### 2.4.9 Adoption of CSA practices by new national farmers

The NURI training was designed to promote the adoption of different CSA practices among the new national farmers aimed at increasing agricultural output of small-scale farmers. The targeted CSA practices were 10 including *good seedbed preparation, use of improved seeds, line planting and correct spacing, recommended intercropping, correct weeding, correct pest and disease control, soil fertility management, post-harvest handling measures during and after harvesting, value addition to crop before marketing or storage, and marketing produce collectively*. Finding reveals that 91.2% of the households adopted at least 3 of the CSA practices, 2.2% adopted all the practices while 1.5% didn't adopt any of the practices. This indicates a high degree of adoption for the CSA practices among the new national farmers. Regarding the district differentials, Koboko district had the highest proportion of HHs that adopted at least 3 CSA practices (96.2%) while Moyo had the least adoption rate (87.7%). The proportions of HHs that adopted at least 3 practices in the districts of Obongi and Adjumani were 91.2% and 90.2% respectively. The highest level of adoption of at least 3 practices was among the growers of beans

(96.8%) and soyabeans (96.4%) while the lowest level was observed among those who grew sesame (89.9%).

Fifty percent (50%) of the KIIs confirmed that the farmers in their communities had adopted at least 3 CSA practices in their communities. Majority (over 50%) of the KIIs indicated that the farmers had adopted either line planting and correct spacing (51.7%) or weeding practices (50%). Adoption of seedbed preparation and use of improved seeds were reported by 46.7% and 45% of the KIIs respectively. See figure 9.

**Figure 8: Proportion of KIIs that reported adoption of various CSA practices among farmers**



### **3.0 RESULTS FOR THE MIXED GROUPS**

The study included 420 members of the mixed groups in the 2 districts of Adjuman and Obong. Of these, 122 respondents were hosts and 198 were refugees. The district of Adjuman contributed 126 refugees and 91 hosts as respondents while Obong had 172 refugees and 31 hosts. It should be noted that the number of hosts in each district (Adjuman (91) and Obong (31)) is too small to produce statistically valid estimates when further disaggregated by various variables. Thus, in this narrative report, the analysis by different variables has been restricted to comparison between districts (Adjuman and Obong) and between membership categories (Refugees and Hosts) that generated valid estimates. However, the analysis of various variables by district by membership category can be found in the appendix.

#### **3.1 Socio-Demographics of Mixed Refugee Respondents**

##### **Gender of respondents and household head**

Members of the Mixed groups that participated in the adoption study comprised of females (63.6%) and males (36.4%). Female hosts (45%) were more than the female refugees (32%). The results further indicated that while simple majority of households (55.3%) were male headed among refugee, the male headed households among hosts constituted almost 3 quarters (73.0%). No child or female managed households participated in the study. The two districts of Adjumani and Obongi had almost the same gender distribution.

##### **Age of respondents and household head**

Overall, the sample consisted of about 24% youthful respondents aged 18-28 years and adults (at least 29 years of age) were 76% in the sample. There were more youth host respondents (33.6%) involved in the study than the youth refugees (19.8%). Regarding the district distribution, Adjumani district (29.2%) had more youthful respondents than Obongi district (18.1%). The study results also showed that while the youth headed households were about 15% of the households, a notable proportion (over 20%) of the households were headed by old people aged at least 49 years. The districts of Adjumani and Obongi as well as the membership category (refugees and hosts) had almost similar age distribution for the household head.

##### **Highest Educational level of the respondent**

The highest level of education attained by most of the members of Mixed groups interviewed was upper primary (34.9%) and lower primary (25.8%). The respondents who had studied beyond the primary education level were only 23.1%. Of these, 20.3% had O'level and 2.8% attained at least A'level. A notable proportion (16%) had no formal education with more respondents in Obongi (20.3%) than Adjumani district (12.0%). Similar distribution of the highest level of education attained was observed among the 2 districts and membership categories.

##### **Main occupation of the respondent**

The results indicated that almost all members of the Mixed groups (97.6%) that participated in the adoption study were farmers. Only 1% were reportedly engaged in business while 1.4% had other occupations rather than farming or business. No substantial difference were observed across districts and membership categories (see Table 19).

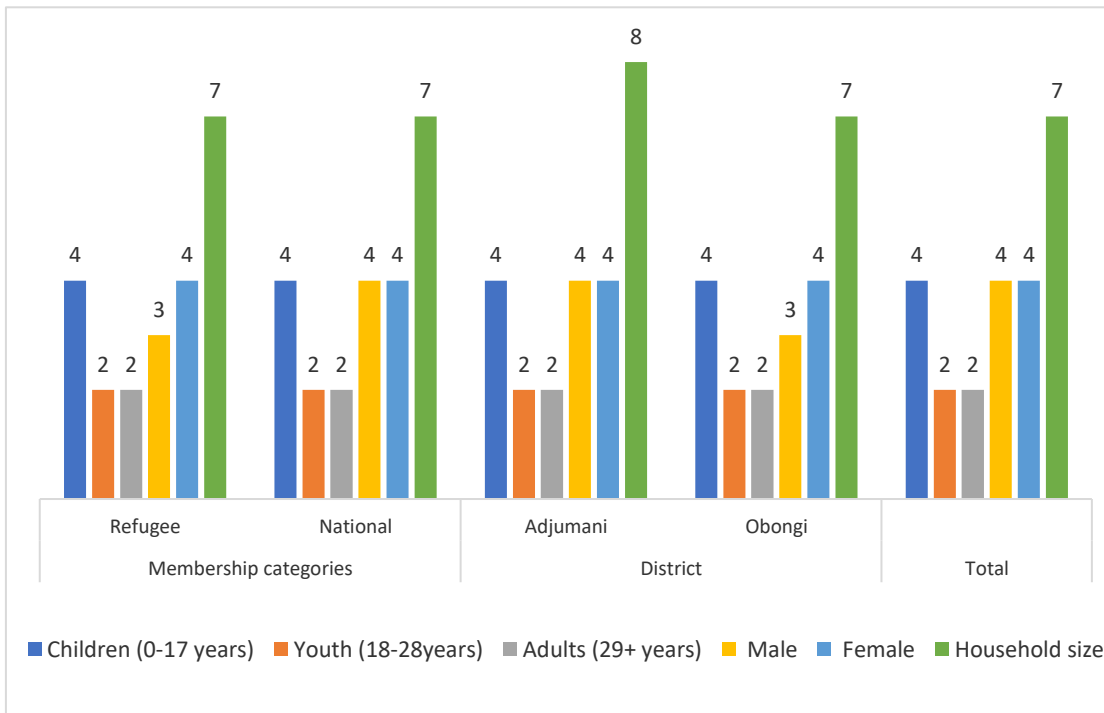
**Table 19: Socio-demographic characteristics of members of Mixed groups surveyed**

		Membership category				District				Total	
		Refugee		Host		ADJUMANI		OBONGI			
		N	%	N	%	N	%	N	%	N	%
Gender of respondents	Male	98	32.9%	55	45.1%	81	37.5%	72	35.3%	153	36.4%
	Female	200	67.1%	67	54.9%	135	62.5%	132	64.7%	267	63.6%
Age of respondents	18-28	59	19.8%	41	33.6%	63	29.2%	37	18.1%	100	23.8%
	29-38	128	43.0%	35	28.7%	72	33.3%	91	44.6%	163	38.8%
	39-48	66	22.1%	27	22.1%	44	20.4%	49	24.0%	93	22.1%
	49+	45	15.1%	19	15.6%	37	17.1%	27	13.2%	64	15.2%
Highest level of education attained	No formal education	52	17.6%	15	12.3%	26	12.0%	41	20.3%	67	16.0%
	Lower-level primary education (P.1 – P.4)	71	24.0%	37	30.3%	55	25.5%	53	26.2%	108	25.8%
	Upper-level primary education (P.5 – P.7)	99	33.4%	47	38.5%	89	41.2%	57	28.2%	146	34.9%
	O-level (S1-S4)	67	22.6%	18	14.8%	40	18.5%	45	22.3%	85	20.3%
	A-level (S5-S6)	1	0.3%	0	0.0%	0	0.0%	1	0.5%	1	0.2%
	Tertiary Institution	6	2.0%	4	3.3%	6	2.8%	4	2.0%	10	2.4%
Main occupation of respondents	University Education	0	0.0%	1	0.8%	0	0.0%	1	0.5%	1	0.2%
	Others	5	1.7%	1	0.8%	2	0.9%	4	2.0%	6	1.5%
	Farming	286	97.6%	117	97.5%	208	97.2%	195	98.0%	403	97.6%
Household headship	Business	2	0.7%	2	1.7%	4	1.9%	0	0.0%	4	1.0%
	Male headed	165	55.4%	89	73.0%	126	58.3%	128	62.7%	254	60.5%
Age of Household head	Female headed	133	44.6%	33	27.0%	90	41.7%	76	37.3%	166	39.5%
	18-28	36	12.4%	24	20.3%	32	15.6%	28	13.8%	60	14.7%
	29-38	115	39.7%	35	29.7%	74	36.1%	76	37.4%	150	36.8%
	39-48	83	28.6%	31	26.3%	46	22.4%	68	33.5%	114	27.9%
	49+	56	19.3%	28	23.7%	53	25.9%	31	15.3%	84	20.6%

**Household (HH) size and composition**

Over all, the average household size among the Mixed groups was 7 persons with an equal average number of male (4) and female (4) members. On average, each HH had two (2) adults aged 29 and above, four (4) children aged 0-17 years and two (2) youth aged 18-28 at the time of the study. Refugee HHs in Adjumani had a slightly higher mean household size of eight (8) compared to Obongi (7). The distribution of members per HH in each district and membership category was the same as the distribution of the overall household membership (see Figure 10 below).

**Figure 9: HH size, age, and gender distribution among mixed refugee households**

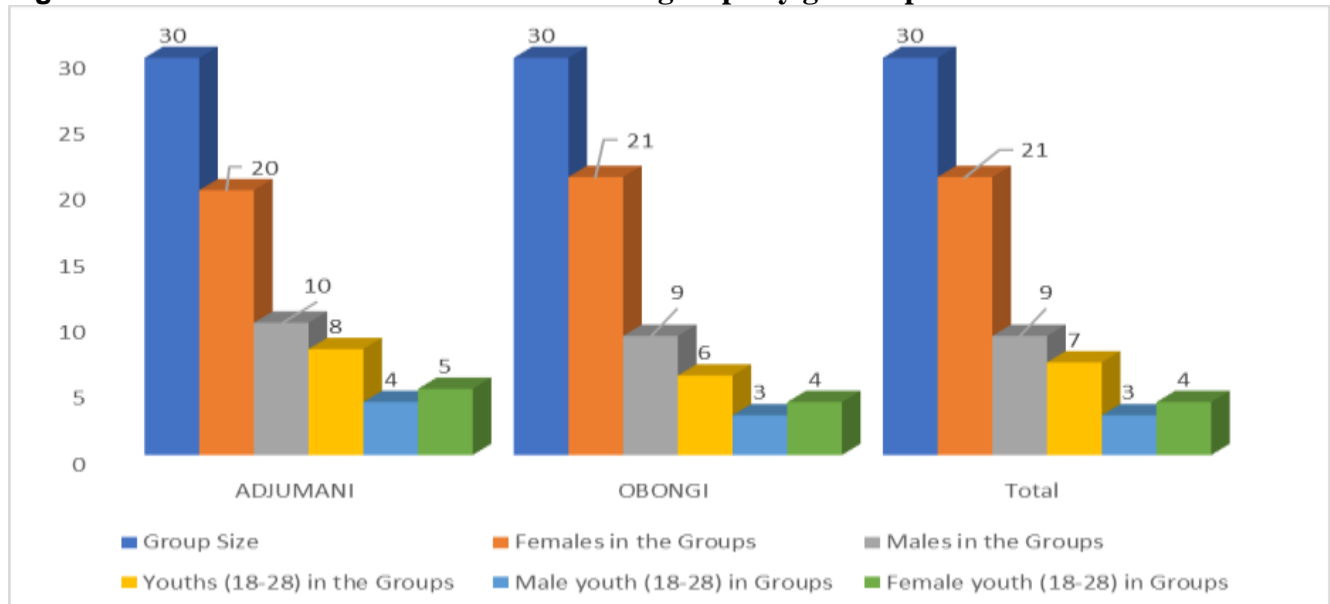


### 3.2 Mixed Groups establishment

#### Group membership

On average, each mixed group comprised 30 members, majority being females (21 (about 70%)). The mean number of females reported per group was 20 in Adjumani and 21 in Obongi. The average number of male group members ranged between 9-10. In a group of 30 members, the youth were only seven (7) of whom three (3) were male and four (4) females. Groups in Adjumani had a slightly higher mean number of youths than those in Obongi (see Figure 11 below).

**Figure 10: Mean number of members in Mixed groups by gender per district**



## Group functionality before and after start of NURI

In a sample of 420 members of the Mixed groups, only about a third (39%) reported belonging to a group that had a *clear goal/objective/plan* (39.6%), *a constitution abide with by the members* (38.9%), *an elected leadership* (39.4%), *proper records/documentation of group activities* (39.4%), and *held regular meetings attended by group members* (39%). This implies that 61% of all members of the Mixed groups that took part in the adoption study belonged to groups that were not functional prior to start-up of the CSA training by NURI. Almost the same proportions distributions of group functionality were observed across membership categories and the 2 districts (see Table 20).

**Table 20: Mixed groups that had good governance structures prior to the CSA training**

	Membership category				District				Total		
	Refugee		Host		ADJUMANI		OBONGI				
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
<b>Groups that had the following aspects function before NURI</b>											
Clear goal/objective/plan	107	38.9%	43	41.3%	69	37.5%	81	41.5%	150	39.6%	
Constitution & if members abide by it	106	38.7%	41	39.4%	66	35.9%	81	41.8%	147	38.9%	
Leadership & if they were elected	105	38.3%	44	42.3%	69	37.5%	80	41.2%	149	39.4%	
Proper records/documentation of group activities	105	38.3%	44	42.3%	69	37.5%	80	41.2%	149	39.4%	
Regular meetings & attendance by members	104	38.1%	43	41.3%	68	37.0%	79	40.9%	147	39.0%	
<b>Gender of elected person to fill the positions</b>											
Group Chairperson	Male	230	77.7%	86	70.5%	137	63.7%	179	88.2%	316	75.6%
	Female	66	22.3%	36	29.5%	78	36.3%	24	11.8%	102	24.4%
Vice Chairperson	Male	125	44.0%	52	45.6%	89	45.4%	88	43.6%	177	44.5%
	Female	159	56.0%	62	54.4%	107	54.6%	114	56.4%	221	55.5%
Treasurer	Male	36	12.2%	8	6.6%	12	5.6%	32	15.8%	44	10.6%
	Female	259	87.8%	114	93.4%	202	94.4%	171	84.2%	373	89.4%
Secretary	Male	199	67.2%	97	79.5%	166	77.2%	130	64.0%	296	70.8%
	Female	97	32.8%	25	20.5%	49	22.8%	73	36.0%	122	29.2%
Publicity/Mobiliser	Male	196	68.1%	78	67.2%	138	68.0%	136	67.7%	274	67.8%
	Female	92	31.9%	38	32.8%	65	32.0%	65	32.3%	130	32.2%
Security	Male	190	82.6%	93	88.6%	164	88.2%	119	79.9%	283	84.5%
	Female	40	17.4%	12	11.4%	22	11.8%	30	20.1%	52	15.5%
Others	Male	2	22.2%	2	22.2%	4	25.0%	0	0.0%	4	22.2%
	Female	7	77.8%	7	77.8%	12	75.0%	2	100.0%	14	77.8%

## Leadership of farmer groups

For the few groups that had leadership, results showed that even though the males were the minority in the groups, they dominated most of the leadership position starting with the position of group chairperson (75.6%), secretary (70.8%), publicity (67.8%), and security (84.5%). Females mostly took the leadership position of vice chairperson (55.5%) and treasurer (89.4%). Seen Table 20 above.

## 3.3 CSA Training and Learning new practices

### Training by NURI and other sources

Almost all members of the Mixed groups in the adoption study acknowledged attending the CSA training from NURI extension staff. Nearly all members from Obongi (98.5%) and 90.2% from Adjumani as well as almost all refugees and hosts admitted that the CSA training was the first training of its kind their group received since its establishment. Among those who had ever been trained before, 21 members had received a similar training from other NGOs while one (1) person reported to have received it from a government extension worker (see Table 19).



## Attendance of training sessions by farmer groups

On the number of sessions attended out of the 10 that NURI extension staff organized, 50.7% fully attended all the 10 sessions while 45% fully attended 5-9 sessions and 4.3% fully attended less than 5 sessions. For individual sessions, all sessions were attended by more than 80% of members of the Mixed groups involved in the adoption study. All sessions were fully attended by over 80% except one session on business skills that had attendance of 79.2% only. The most fully attended sessions included seedbed preparation, planting intercropping and weeding (94.3%), post-harvest handling and value addition (90.9%), CSA practices and technologies (88.1%), enterprise selection for groups (88%), pests and disease control (87.1%), climate change and impact (84.3%), and soil fertility and water management (85.9%) (see Table 21 for a detailed breakdown by district).

**Table 21: Participation in CSA training and sessions attended either fully or partially**

		Membership category				District				Total	
		Refugee		National		ADJUMANI		OBONGI			
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Received training on CSA from NURI extension staff in 2020		297	99.7%	121	99.2%	215	100.0%	203	100.0%	418	100.0%
NURI CSA training was the first extension training for the group		281	94.3%	111	91.0%	193	90.2%	199	98.5%	392	94.2%
Source of training	NGO	12	76.0%	8	72.7%	19	90.5%	2	66.7%	21	75.0%
	Gov't	0	0.0%	1	9.1%	1	4.8%	0	0.0%	1	4.2%
	Others	1	6.1%	0	0.0%	0	0.0%	1	33.3%	1	4.2%
<b>CSA sessions attended and duration</b>											
Setting ground rules	Fully	257	86.2%	105	86.1%	181	83.8%	181	88.7%	362	86.2%
	Partially	7	2.3%	2	1.6%	6	2.8%	3	1.5%	9	2.1%
	Not at all	34	11.4%	15	12.3%	29	13.4%	20	9.8%	49	11.7%
Climate, climate Change & impact	Fully	258	86.6%	96	78.7%	163	75.5%	191	93.6%	354	84.3%
	Partially	7	2.3%	5	4.1%	10	4.6%	2	1.0%	12	2.9%
	Not at all	33	11.1%	21	17.2%	43	19.9%	11	5.4%	54	12.9%
CSA practices & technologies	Fully	268	89.9%	102	83.6%	181	83.8%	189	92.6%	370	88.1%
	Partially	7	2.3%	3	2.5%	7	3.2%	3	1.5%	10	2.4%
	Not at all	23	7.7%	17	13.9%	28	13.0%	12	5.9%	40	9.5%
Enterprise selection for groups	Fully	262	88.5%	106	86.9%	173	80.8%	195	95.6%	368	88.0%
	Partially	10	3.4%	4	3.3%	13	6.1%	1	0.5%	14	3.3%
	Not at all	24	8.1%	12	9.8%	28	13.1%	8	3.9%	36	8.6%
Seedbed preparation, planting, intercropping & weeding	Fully	283	95.0%	113	92.6%	201	93.1%	195	95.6%	396	94.3%
	Partially	10	3.4%	7	5.7%	12	5.6%	5	2.5%	17	4.0%
	Not at all	5	1.7%	2	1.6%	3	1.4%	4	2.0%	7	1.7%
Pests & disease control	Fully	265	89.2%	100	82.0%	172	80.0%	193	94.6%	365	87.1%
	Partially	7	2.4%	3	2.5%	8	3.7%	2	1.0%	10	2.4%
	Not at all	25	8.4%	19	15.6%	35	16.3%	9	4.4%	44	10.5%
Soil fertility & water management	Fully	263	88.6%	96	79.3%	164	76.6%	195	95.6%	359	85.9%
	Partially	7	2.4%	2	1.7%	8	3.7%	1	0.5%	9	2.2%
	Not at all	27	9.1%	23	19.0%	42	19.6%	8	3.9%	50	12.0%
Post-harvest handling & value addition	Fully	279	93.9%	102	83.6%	182	84.7%	199	97.5%	381	90.9%
	Partially	4	1.3%	3	2.5%	4	1.9%	3	1.5%	7	1.7%
	Not at all	14	4.7%	17	13.9%	29	13.5%	2	1.0%	31	7.4%
Business skills	Fully	233	78.2%	79	65.3%	139	64.7%	173	84.8%	312	74.5%
	Partially	13	4.4%	7	5.8%	14	6.5%	6	2.9%	20	4.8%
	Not at all	52	17.4%	35	28.9%	62	28.8%	25	12.3%	87	20.8%
Marketing	Fully	241	81.1%	81	68.6%	148	69.2%	174	86.6%	322	77.6%
	Partially	12	4.0%	6	5.1%	16	7.5%	2	1.0%	18	4.3%
	Not at all	44	14.8%	31	26.3%	50	23.4%	25	12.4%	75	18.1%

## CSA Training evaluation by participants

Overall, 82.8% of members of the Mixed groups in the adoption study found the time allocated to the various sessions appropriate. Only 13.7% in Obongi and 7.9% in Adjumani. 11% of refugees and 9% of hosts in the mixed groups found the time allocated to the sessions too short. Similarly, those who felt the sessions were too long were only 6.5% over all. The timing of the CSA trainings in relation to the

farming calendar was also appreciated; 93.7% agreed that the training matched well with the farming calendar. The training methods used in the sessions were universally acknowledged as either very good (52.1%) or good (46.4%) by the members of the Mixed groups that participated in the adoption study. Only 1.5% expressed dissatisfaction with the training methods used.

### Relevance of training to daily on-farm production activities

Over 80% of the respondents acknowledged that all the topics covered in the training were very relevant to their daily on-farm production activities. For all the 10 topics/sessions organized, participants who felt that the topics were not relevant to their daily on-farm production activities were in most cases less than a tenth (<10%) except for one topic. Sixteen percent (16%) of respondents found the sessions on “*business skills and marketing*” irrelevant. Majority of farmers in the Mixed groups considered session on “*seed bed preparation, planting, intercropping and weeding*” (99.2%) relevant. Other topics/sessions in the CSA training that got more than 90% of the respondents rating them as very relevant included “*post-harvest handling and value addition*” (92.6%) and the topic on “*enterprise selection*” (90.9%).

Regarding influence on agricultural production knowledge, 57.4% of members of the Mixed groups admitted the CSA trained had to a large extent helped them improve their agricultural production knowledge. Another 39.7% acknowledged that the training had to a “*moderate extent*” improved their agricultural production knowledge. Only 2.9% said the CSA training had little change on their knowledge, and no member reported CSA training not to have had any effect on their agricultural production knowledge. All participants in the adoption study except three (3) people (0.7%) affirmed that they would recommend other farmers in their communities to attend a similar training in future. See Table 22 below.

**Table 22: Members of Mixed groups rating of relevance of the CSA training sessions**

		Membership category				District				Total	
		Refugee		Host		ADJUMANI		OBONGI			
		N	%	N	%	N	%	N	%	N	%
Rating of time allocated to each CSA training session	Too short	32	11.0%	12	9.9%	17	7.9%	27	13.7%	44	10.7%
	Too long	18	6.2%	9	7.4%	15	6.9%	12	6.1%	27	6.5%
	Appropriate	242	82.9%	100	82.6%	184	85.2%	158	80.2%	342	82.8%
Rating of the timing of the training vis-à-vis farming calendar	Very Good	117	40.5%	57	48.3%	121	58.2%	53	26.6%	174	42.8%
	Good	156	54.0%	51	43.2%	67	32.2%	140	70.4%	207	50.9%
	Fair	12	4.2%	6	5.1%	12	5.8%	6	3.0%	18	4.4%
	Poor	4	1.4%	4	3.4%	8	3.8%	0	0.0%	8	2.0%
Rating of the training methods used	Very Good	142	49.5%	67	58.8%	138	67.3%	71	36.2%	209	52.1%
	Good	140	48.8%	46	40.4%	63	30.7%	123	62.8%	186	46.4%
	Fair	5	1.7%	1	0.9%	4	2.0%	2	1.0%	6	1.5%
	Poor	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Assessed relevance of sessions											
Climate, climate Change & impact	Very relevant	258	89.6%	103	87.3%	172	83.1%	189	95.0%	361	88.9%
	Fairly relevant	8	2.8%	1	0.8%	7	3.4%	2	1.0%	9	2.2%
	Not relevant	22	7.6%	14	11.9%	28	13.5%	8	4.0%	36	8.9%
CSA practices & technologies	Very relevant	261	90.0%	102	86.4%	176	83.8%	187	94.4%	363	89.0%
	Fairly relevant	10	3.4%	4	3.4%	12	5.7%	2	1.0%	14	3.4%
	Not relevant	19	6.6%	12	10.2%	22	10.5%	9	4.5%	31	7.6%
Enterprise selection for groups	Very relevant	266	91.4%	104	89.7%	178	86.8%	192	95.0%	370	90.9%
	Fairly relevant	12	4.1%	8	6.9%	16	7.8%	4	2.0%	20	4.9%
	Not relevant	13	4.5%	4	3.4%	11	5.4%	6	3.0%	17	4.2%
Seed bed preparation, planting, intercropping & weeding	Very relevant	283	95.9%	116	96.7%	205	96.2%	194	96.0%	399	96.1%
	Fairly relevant	9	3.1%	4	3.3%	7	3.3%	6	3.0%	13	3.1%

	Not relevant	3	1.0%	0	0.0%	1	0.5%	2	1.0%	3	0.7%
Pests & disease control	Very relevant	258	88.4%	92	79.3%	160	77.7%	190	94.1%	350	85.8%
	Fairly relevant	21	7.2%	12	10.3%	30	14.6%	3	1.5%	33	8.1%
	Not relevant	13	4.5%	12	10.3%	16	7.8%	9	4.5%	25	6.1%
Soil fertility & water management	Very relevant	256	88.0%	89	77.4%	153	75.0%	192	95.0%	345	85.0%
	Fairly relevant	21	7.2%	12	10.4%	29	14.2%	4	2.0%	33	8.1%
	Not relevant	14	4.8%	14	12.2%	22	10.8%	6	3.0%	28	6.9%
Post-harvest handling & value addition	Very relevant	270	92.8%	105	92.1%	182	89.7%	193	95.5%	375	92.6%
	Fairly relevant	10	3.4%	5	4.4%	11	5.4%	4	2.0%	15	3.7%
	Not relevant	11	3.8%	4	3.5%	10	4.9%	5	2.5%	15	3.7%
Business skills	Very relevant	224	77.0%	75	66.4%	133	66.2%	166	81.8%	299	74.0%
	Fairly relevant	28	9.6%	13	11.5%	28	13.9%	13	6.4%	41	10.1%
	Not relevant	39	13.4%	25	22.1%	40	19.9%	24	11.8%	64	15.8%
Marketing	Very relevant	227	78.0%	80	70.8%	142	70.6%	165	81.3%	307	76.0%
	Fairly relevant	27	9.3%	8	7.1%	21	10.4%	14	6.9%	35	8.7%
	Not relevant	37	12.7%	25	22.1%	38	18.9%	24	11.8%	62	15.3%
Extent the training improved members agricultural production knowledge	No change	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Little extent	8	2.7%	4	3.4%	5	2.4%	7	3.6%	12	2.9%
	Moderate extent	114	39.2%	48	41.0%	56	26.4%	106	54.1%	162	39.7%
	A large extent	169	58.1%	65	55.6%	151	71.2%	83	42.3%	234	57.4%
Would recommend other farmers to attend a similar training		288	99.3%	119	99.2%	211	99.5%	196	99.0%	407	99.3%

### 3.4 Application of CSA Practices on fields

#### 3.4.1 Strategic crops and CSA practices assessed.

The mixed groups were supported in crops similar to the strategic crops cultivated by the hosts however in their case, they were called field crops. The crops were Sesame, Maize, Groundnuts, Cassava and Beans. About 80% of the farmers were reportedly not growing these strategic crops for the first time, they had grown them before joining the NURI programme. It was only 21.2% in Adjumani and 20.8% in Obongi that had grown the field crop for the first time. Although less than 25% of refugees or hosts had grown the crops for the first time, the proportion of refugees (24.7%) was twice that of the hosts (12.4%). Slightly over 23% of the farmers had grown sesame and beans for the first time. Others crops grown for the first time included maize (18.4%), groundnuts (18.4%) and cassava (15.6%). Hence, majority of mixed group members had planted Sesame, beans, cassava, groundnuts and maize prior to joining NURI programme.

**Table 23:** Proportion of households that grew strategic crops for the first time

		Membership category				District				Total	
		Refugee		Host		ADJUMANI		OBONGI			
		N	%	N	%	N	%	N	%	N	%
Growing the strategic crop for the first time	Yes	71	24.7%	15	12.4%	46	21.2%	40	20.8%	86	21.0%
	No	217	75.3%	106	87.6%	171	78.8%	152	79.2%	323	79.0%

District	Strategic crop	Land size (in acres)						Grown for first time					
		Refugee		Host		Total		Refugee		Host		Total	
		HHs	Mean	HHs	Mean	HHs	Mean	HHs	%	HHs	%	HHs	%
ADJUMANI	SESAME	1	0.2	0	.	1	.	1	100.0%	0	0.0%	1	100.0%
	MAIZE	71	15.3	57	0.7	128	8.8	16	22.5%	5	8.8%	21	17.1%
	GROUNDNUTS	41	0.5	26	0.7	67	0.6	7	17.1%	3	11.5%	10	15.2%
	CASSAVA	4	0.8	2	0.7	6	0.7	0	0.0%	0	0.0%	0	0.0%
	BEANS	137	7.6	98	0.6	235	4.6	40	29.2%	13	13.3%	53	22.9%
OBONGI	SESAME	59	0.5	6	0.6	65	0.5	13	22.4%	1	16.7%	14	21.9%
	MAIZE	64	0.6	7	0.6	71	0.6	14	24.6%	0	0.0%	14	22.2%
	GROUNDNUTS	140	0.6	26	0.6	166	0.6	28	21.2%	3	12.0%	31	19.7%
	CASSAVA	13	0.4	1	0.5	14	0.4	1	9.1%	0	0.0%	1	8.3%
	BEANS	2	0.5	1	0.5	3	0.5	1	50.0%	0	0.0%	1	33.3%
Total	SESAME	60	0.5	6	0.6	66	0.5	14	23.7%	1	16.7%	15	23.1%
	MAIZE	135	8.1	64	0.7	199	5.7	30	23.4%	5	7.9%	35	18.8%
	GROUNDNUTS	181	0.5	52	0.7	233	0.6	35	20.2%	6	11.8%	41	18.4%
	CASSAVA	17	0.5	3	0.6	20	0.5	1	6.7%	0	0.0%	1	5.6%
	BEANS	139	7.5	99	0.6	238	4.6	41	29.5%	13	13.1%	54	23.1%

Over all, the highest proportion of the mixed group members hired land from non-group members, increasing from 26% in 2020 to 28.6% in 2021. Use of land owned by the family slightly increased from 19.8% in 2020 to 25% in 2021 and there was slight reduction in renting land from non-group members from 12% in 2020 to 11.7% in 2021. The proportion of mixed group members (8.9%) who cultivated the land obtained through the allocations by the Office of the Prime Minister (OPM) remained the same between 2020 and 2021 and it was used by mainly refugees (11.7%). Other mixed group members either borrowed land or used communal owned land for cultivation. The hosts in these mixed groups mostly used the family-owned land (54% in 2020 and 70.5% in 2021) while most refugees hired land either from group members or outside the group (35.2% in 2020 and 37.9% in 2021). See table 24.

**Table 24:** Acquisition of land cultivated by household in 2020 and 2021 production cycle

	Membership category								District								Year
	Refugee				Host				ADJUMANI				OBONGI				
	Year 2020		Year 2021		Year 2020		Year 2021		Year 2020		Year 2021		Year 2020		Year 2021		
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Allocated by OPM	35	11.7%	35	11.7%	1	0.8%	1	0.8%	0	0.0%	1	0.5%	36	17.7%	35	17.2%	36
Borrowed from mixed groups	41	13.8%	47	15.8%	4	3.3%	7	5.7%	12	5.5%	16	7.4%	33	16.3%	38	18.7%	45
Borrowed from non-group members	28	9.4%	45	15.1%	5	4.1%	9	7.4%	18	8.3%	26	12.0%	15	7.4%	28	13.8%	33
Hired from group members	50	16.8%	48	16.1%	1	0.8%	1	0.8%	18	8.3%	16	7.4%	33	16.3%	33	16.3%	51
Hired from non-group members	105	35.2%	113	37.9%	4	3.3%	7	5.7%	59	27.2%	65	30.0%	50	24.6%	55	27.1%	109

Family owned	16	5.4%	19	6.4%	67	54.9%	86	70.5%	62	28.6%	84	38.7%	21	10.3%	21	10.3%	83
Communal owned	1	0.3%	2	0.7%	7	5.7%	9	7.4%	6	2.8%	9	4.1%	2	1.0%	2	1.0%	8

**Table 25: Average size of cultivated land acquired from various sources**

	Membership category				District				Total	
	Refugee		Host		Adjumani		Obongi			
	Year: 2020	Year: 2021	Year: 2020	Year: 2021	Year: 2020	Year: 2021	Year: 2020	Year: 2021	Year: 2020	Year: 2021
Office of the Prime Minister (OPM)	0.4	0.4	0.3	0.3		0.3	0.4	0.4	0.4	0.4
Borrowed from mixed groups	0.5	0.5	0.3	0.4	0.5	0.7	0.4	0.4	0.4	0.5
Borrowed from non-group members	0.5	0.6	0.5	0.8	0.6	0.7	0.4	0.6	0.5	0.6
Hired from group members	0.6	0.7	1.0	1.0	0.5	0.7	0.7	0.8	0.6	0.7
Hired from non-group members	0.6	0.6	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.6
Family owned	0.8	0.8	1.0	1.3	0.9	1.2	1.0	1.0	1.0	1.2
Communal owned	0.8	0.4	0.4	0.6	0.4	0.6	0.5	0.5	0.4	0.6
<b>Total</b>	<b>0.6</b>	<b>0.6</b>	<b>0.7</b>	<b>0.8</b>	<b>0.6</b>	<b>0.7</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.7</b>

### 3.4.2 Seedbed Preparation for Production by Mixed groups

On clearing fields for ploughing, 80.5% of the respondents cut the shrubs and 19.8% slashed their fields. While none of the members of the Mixed groups interviewed used herbicides to spray the shrubs, less than a tenth (7.1%) reportedly used burning as the method to clear their fields in preparation for planting. For ploughing, slightly over 89% of the respondents used the hand hoe and ploughed their fields twice before planting. Only 18.8% used animal traction and 1.9% a tractor to plough the land. Thus, mechanization of farming was still very low (see Table 26).

**Table 26: Application of CSA seedbed preparation practices by members of Mixed groups**

	Membership category				District				Total	
	Refugee		Host		ADJUMANI		OBONGI			
	N	%	N	%	N	%	N	%	N	%
Ways land was cleared for ploughing										
Burning field	16	5.4%	14	11.5%	21	9.7%	9	4.4%	30	7.1%
Slashing	63	21.1%	20	16.4%	46	21.3%	37	18.1%	83	19.8%
Cutting shrubs/trees	236	79.2%	102	83.6%	183	84.7%	155	76.0%	338	80.5%
Spraying with herbicides	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Others	27	9.1%	11	9.0%	32	14.8%	6	2.9%	38	9.0%
Methods used to till/plough the land										
Hoe	269	90.3%	108	88.5%	187	86.6%	190	93.1%	377	89.8%
Animal traction	48	16.1%	31	25.4%	64	29.6%	15	7.4%	79	18.8%
Tractor	4	1.3%	4	3.3%	6	2.8%	2	1.0%	8	1.9%
Others	1	0.3%	0	0.0%	1	0.5%	0	0.0%	1	0.2%
No. of times ploughed field before planting the strategic crop										
Once	30	10.2%	10	8.2%	15	7.0%	25	12.4%	40	9.6%
Twice	238	80.7%	101	82.8%	180	83.7%	159	78.7%	339	81.3%
Thrice	27	9.2%	11	9.0%	20	9.3%	18	8.9%	38	9.1%
Elements of seedbed preparation recalled										
No burning of field	284	96.3%	113	92.6%	200	92.6%	197	98.0%	397	95.2%
Proper selection of site considering fertility	249	83.8%	85	69.7%	141	65.3%	193	95.1%	334	79.7%
Minimum soil disturbance	183	62.0%	57	46.7%	54	25.1%	186	92.1%	240	57.6%
Minimal tree cutting	231	78.0%	88	72.1%	127	58.8%	192	95.0%	319	76.3%

First and second tillage	281	94.9%	113	92.6%	200	92.6%	194	96.0%	394	94.3%
Good seedbed preparation	269	91.2%	98	80.3%	167	77.7%	200	99.0%	367	88.0%
New elements about seedbed preparation learnt in CSA training	174	62.1%	92	76.7%	178	86.4%	88	45.4%	266	66.5%
Elements of good seedbed preparation could be observed in the fields	244	81.9%	101	82.8%	188	90.8%	157	88.7%	345	89.8%

Regarding recalling the elements of seedbed preparation taught during the training, more than half (>50%) of the respondents recalled each element. The highest proportion of respondents recalled “no burning of fields” as a topic taught. The next 3 elements mentioned by at least 75% of the respondents included; *First and second tillage* (94.3%), *Good seedbed preparation* (88%), *Proper selection of site considering fertility* (79.7%) and *minimal disturbance of soils* (57.6%). Over all, about every two in three (66.5%) respondents acknowledged to have learnt new elements about seed preparation. Note that there were higher proportions of hosts (76.7%) or residents of Adjumani (86.4%) who indicated to have learnt new elements than their counterparts (62.1% refugees and 45.4% Obongi respectively). Further, the level of translation of acquired knowledge into practice was high, since elements of good seedbed preparation were observed on 89.8% of all the farm fields visited.

### 3.4.3 Use of Improved Seeds among Mixed groups

Prior to joining the NURI programme, most members of the Mixed groups (87.7%) planted local seeds. However, nearly every member (99.3%) reported to have planted improved seeds in 2021, indicating high degree of adoption of improved seeds. Only four (4) members of the Mixed groups (1 in Adjumani and 3 in Obongi district) mentioned using local seeds in the year 2021. More than three quarters (87.4%) obtained the improved seeds from demonstration plots and 8.9% got them from Other development partners while less than 5% obtained them from other sources. There were no much differences in the distribution of the results across membership categories (refugees vs Hosts) and the 2 districts (Adjumani and Obongi) (see Table 27).

**Table 27: Use of improved seed by mixed groups before and after joining NURI**

	Membership category				District				Total	
	Refugee		Host		Adjumani		Obongi			
	N	%	N	%	N	%	N	%	N	%
Seeds used to plant before joined NURI										
Improved	34	11.6%	17	14.0%	42	20.0%	9	4.4%	51	12.3%
Local	258	88.4%	104	86.0%	168	80.0%	194	95.6%	362	87.7%
Both	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Type of seeds planted this year (2021)										
Improved	289	99.3%	117	99.2%	213	99.5%	193	99.0%	406	99.3%
Local	2	0.7%	1	0.8%	1	0.5%	2	1.0%	3	0.7%
Both	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Source of the improved seeds planted										
Home saved	11	3.8%	7	5.9%	5	2.3%	13	6.7%	18	4.4%
Market	6	2.1%	12	10.1%	17	7.9%	1	0.5%	18	4.4%
Demonstration plot	258	87.5%	104	87.4%	182	85.4%	180	89.6%	362	87.4%
OWC	1	0.3%	0	0.0%	1	0.5%	0	0.0%	1	0.2%
Other development partners	27	9.3%	9	7.7%	26	12.2%	10	5.2%	36	8.9%
Input dealer	3	1.0%	4	3.4%	7	3.3%	0	0.0%	7	1.7%
Rating of germination of seeds used										
Very good	154	53.1%	65	53.7%	158	73.8%	61	31.0%	219	53.3%
Good	129	44.5%	50	41.3%	51	23.8%	128	65.0%	179	43.6%
Fair	7	2.4%	5	4.1%	4	1.9%	8	4.1%	12	2.9%
Poor	0	0.0%	1	0.8%	1	0.5%	0	0.0%	1	0.2%

Elements recalled on use of improved seeds										
Certified and viable	246	82.8%	82	67.2%	127	58.8%	201	99.0%	328	78.3%
Clean/pure/uniform in size and colour	254	85.5%	87	71.3%	141	65.3%	200	98.5%	341	81.4%
Wholesomeness	244	82.2%	80	65.6%	126	58.3%	198	97.5%	324	77.3%
Pest and disease resistant	236	79.5%	75	61.5%	118	54.6%	193	95.1%	311	74.2%
Drought tolerant	224	75.4%	80	65.6%	111	51.4%	193	95.1%	304	72.6%
Early maturing and/or uniform in maturity	251	84.5%	85	69.7%	139	64.4%	197	97.0%	336	80.2%
High yielding	269	90.6%	107	87.7%	184	85.2%	192	94.6%	376	89.7%
Found new elements on use of improved seeds covered in the training	191	64.7%	76	62.3%	159	74.0%	108	53.5%	267	64.0%
Use of improved seeds observed in the field	273	91.6%	113	92.6%	199	96.1%	187	98.9%	386	97.5%

Recall of the elements taught in the use of improved seeds and practice of the learned elements was quite high (over 72%). The element of *drought tolerant* was the least recalled element (72%) and the most remembered element was *high yield* (89.7%). More residents of Obongi district and more refugees recalled the elements taught than their counterparts in Adjumani districts and hosts respectively. The use of improved seeds was observed in 97.5% of the fields for members of the mixed groups visited during the study with almost equal proportions in the two districts and across membership categories.

#### 3.4.4 Planting Seeds before and after the CSA Training by NURI

Most members (72.1%) of the Mixed groups were using the broadcasting method of planting seeds prior to the NURI CSA training. The practice was more common in settlement in Obongi district (76%) and among refugees (73.4%) than in Adjumani district (68.4%) and hosts (68.3%). Only 11% reported to have been using line planting prior to enrolling onto the NURI programme while 16.9% were using both line planting and broadcasting depending on type of crop being planted. However, following the CSA training by extension staff of NURI in 2020, the practice significantly changed from broadcasting to line planting. In 2021, 89.2% of the members of the Mixed groups interviewed used line planting. Only 9.6% reported to have continued using the broadcasting method and those that used both were five (5) persons from Obongi (~1.2%).

On the state of recall of the content in the CSA training session on planting seeds, recall was notably high for all the elements of planting that were discussed in the CSA training. The most recalled elements were “*planting in lines*” (97.9%), “*correct spacing*” (92.6%), and “*recommended intercropping*” (about 89%). This level of recall denotes appreciation of the training and desire to adopt CSA practices. These elements taught under modern methods of planting seed were new to 73.3% of the farmers, hence only 26.7% had ever learnt about modern methods of planting. The translation of the new knowledge was also notably high, as planting in lines, using the recommended spacing between rows and plants was observed on 78.7% of the farmers’ fields visited. Only 21.3% of farmers’ fields visited had continued to use the broadcasting method. Adoption of intercropping was also high, observed in 72.9% of farmers’ fields visited. While more hosts learnt new elements under line planting during the training (83.6%) than the refugees (68.9%), more refugees (73.3%) adopted line planting and correct space learnt in the training than the hosts (66.4%). Similarly, More farmers in Adjumani (94.4%) than those in Obongi district (50.5%) learnt new elements under line planting during the training. No significant differences were found in the distribution of the rest of the results between the 2 membership categories and the 2 districts. (see Table 28 below).

**Table 28: Reported methods of planting seeds prior and after start of the NURI programme**

	Membership Category				District				Total	
	Refugee		Host		Adjumani		Obongi			
	N	%	N	%	N	%	N	%	N	%
Methods of planting seeds used before joining NURI										
Line planting	31	10.7%	14	11.7%	30	14.4%	15	7.5%	45	11.0%
Broad casting	213	73.7%	82	68.3%	143	68.4%	152	76.0%	295	72.1%
Both	45	15.6%	24	20.0%	36	17.2%	33	16.5%	69	16.9%
Methods of planting seeds used this year (2021)										
Line planting	263	89.5%	108	88.5%	199	92.6%	172	85.6%	371	89.2%
Broad casting	27	9.2%	13	10.7%	16	7.4%	24	11.9%	40	9.6%
Both	4	1.4%	1	0.8%	0	0.0%	5	2.5%	5	1.2%
Recall of elements from training about planting seeds										
Planting in lines	293	98.7%	117	95.9%	210	97.2%	200	98.5%	410	97.9%
Correct spacing	282	94.9%	106	86.9%	192	88.9%	196	96.6%	388	92.6%
Recommended Intercropping	268	90.2%	104	85.2%	175	81.0%	197	97.0%	372	88.8%
New elements under line planting learnt during the training	202	68.9%	102	83.6%	203	94.4%	101	50.5%	304	73.3%
Line planting and correct spacing observed in the field	219	73.5%	81	66.4%	158	78.2%	142	79.3%	300	78.7%
Recommended intercropping observed in the field	208	69.8%	85	69.7%	157	75.8%	136	69.7%	293	72.9%

### 3.4.5 Weeding as a Farming Practice

Ninety nine percent (99%) of members of the mixed groups that participated in the study weeded their fields the season for 2021, making weeding a universal practice. Only four (4) refugees in Obongi did not weed their fields in 2021. Nearly all members of the Mixed groups (98.6%) used the hand hoe to weed their fields and only 2 members of the mixed groups used chemicals in their field. Less than a tenth (8.3%) weeded once while 18.1% weeded more than two times. A change was observed on the number of times a field is weeded. Whereas most farmers started weeding twice (73.5%) after NURI training, only slightly above half (56.8%) were weeding two times in a season prior to joining NURI. During field observations in the adoption study, 85.2% of all interviewed members of the mixed groups had adopted the acceptable weeding control measures/correct weeding. Correct weeding was not found on 14.8% of the farm fields visited. No much differences were observed in the results distribution in the categories of membership and between the districts. (See Table 29 below).

**Table 29: Farmers that practice weeding of fields in conformity to the CSA training**

	Membership Category				District				Total		
	Refugee		Host		Adjumani		Obongi				
	N	%	N	%	N	%	N	%	N	%	
Weeded field this season	293	98.7%	120	100.0%	215	100.0%	198	98.0%	413	99.0%	
Number of times farmers weeded this season	1	24	8.3%	10	8.3%	14	6.6%	20	10.3%	34	8.3%
	2	208	72.2%	92	76.7%	157	73.7%	143	73.3%	300	73.5%
	3+	56	19.4%	18	15.0%	42	19.7%	32	16.4%	74	18.1%
Method of weeding used											
Hand hoe (Mechanical)	288	98.0%	122	100.0%	215	99.5%	195	97.5%	410	98.6%	
Chemical	1	0.3%	1	0.8%	1	0.5%	1	0.5%	2	0.5%	



No. of times farmer was weeding prior to joining NURI	Once	100	34.8%	39	33.1%	57	27.5%	82	41.4%	139	34.3%
	Twice	157	54.7%	73	61.9%	137	66.2%	93	47.0%	230	56.8%
	Thrice	19	6.6%	5	4.2%	12	5.8%	12	6.1%	24	5.9%
	None	11	3.8%	1	0.8%	1	0.5%	11	5.6%	12	3.0%
First Weeding was completed		289	99.7%	122	100.0%	216	100.0%	195	99.5%	411	99.8%
Period when first weeding was done (in weeks)	1-2	186	63.5%	80	65.6%	146	67.6%	120	60.3%	266	64.1%
	3-4	105	35.8%	41	33.6%	70	32.4%	76	38.2%	146	35.2%
	5+	2	0.7%	1	0.8%	0	0.0%	3	1.5%	3	0.7%
Second weeding was completed		262	94.2%	106	95.5%	193	96.0%	175	93.1%	368	94.6%
Period when second weeding was done (in weeks)	1-2	26	9.5%	10	8.8%	12	5.9%	24	13.2%	36	9.3%
	3-4	141	51.6%	50	44.2%	94	46.1%	97	53.3%	191	49.5%
	5+	106	38.8%	53	46.9%	98	48.0%	61	33.5%	159	41.2%
Recall about weeding from the CSA training											
Timely weeding		289	97.3%	115	94.3%	211	97.7%	193	95.1%	404	96.4%
Application of alternative measures		225	75.8%	80	65.6%	121	56.0%	184	90.6%	305	72.8%
Combination of methods		202	68.0%	62	51.2%	86	40.0%	178	87.7%	264	63.2%
New elements learnt about weed control		173	58.8%	80	66.1%	149	69.3%	104	52.0%	253	61.0%
Correct weeding observed in the field		238	79.9%	95	77.9%	176	86.7%	157	83.5%	333	85.2%

Assessment of weeding practices by type of strategic crop planted revealed that the hand-hoe was universally (over 97%) used to weed the various strategic crops planted. Only three persons growing groundnuts, beans and maize used chemicals to kill the weeds in their fields. Apart from Sesame, all (100%) farmers had completed the first weeding for the rest of the strategic crops and over 83% of them completed their second weeding. This partly explains why correct weeding was observed on more than 78% of the fields for the various strategic crops planted in the 2021 planting season. See Table 30 below.

**Table 30: Weeding practices by type of strategic crop planted among mixed groups**

Strategic crop	Weeded the field this season		Method of weeding used				Weeding done after planting the crop				Correct weeding observed in the field	
			Hand hoe (Mechanical):		Chemical		First Weeding: Completed		Second weeding: Completed			
	N	%	N	%	N	%	N	%	N	%	N	%
SESAME	59	95.2%	60	100.0%	0	0.0%	59	98.3%	49	87.5%	47	78.3%
MAIZE	174	100.0%	170	97.7%	1	0.6%	171	100.0%	152	96.2%	142	87.7%
GROUNDNUTS	199	99.0%	195	97.5%	1	0.5%	199	100.0%	187	95.9%	164	88.2%
CASSAVA	20	100.0%	20	100.0%	0	0.0%	19	100.0%	15	83.3%	16	80.0%
BEANS	172	100.0%	172	99.4%	1	0.6%	173	100.0%	154	95.1%	140	87.0%

### 3.4.6 Pest and Disease Control among beneficiaries of the CSA Training

About half (53.3%) of mixed group members interviewed confirmed to have registered occurrence of pests and diseases since they started growing strategic crops. The commonly reported pests registered included the *fall army worm*, *nematodes*, *termites*, and *rodents*, while the common diseases were *groundnut rosette* and *maize streak*. Measures taken to control the pests and diseases that attacked their fields included *spraying pesticides*, *sprinkling sand*, *using crop rotation*, *setting rodent traps* and *uprooting infected plants* among others.

During the study, more than 80% of the farmers recalled 3 measures for pests and disease management

taught during the training. These included *use of cultural methods* (80.8%), *organic methods* (86.3%), and *chemical control* (84.4%). Slightly over 56% could remember the *use a combination of methods* to manage pests and diseases was covered during the training. More members from Obongi district (84.1%) and refugee (63.1%) recalled the *use a combination of methods* than their counterparts (30.7% Adjumani and 40.5% Hosts ). While about two in every three farmers acknowledge to have learnt new elements of pests and disease management during the training, slightly over 55% of the famers' fields had correct pest and disease control measures. This indicates that translation of acquired knowledge into practice was still low despite the high degree of recall of the elements. It was mostly farm fields for members from Obongi district (55.6%) and refugees (56.5%) where correct pests and disease control measures were observed (See Table 31 below).

**Table 31: Pest and Disease Control among beneficiaries of the CSA Training**

	Membership Category				District				Total	
	Refugee		Host		Adjumani		Obongi		N	%
	N	%	N	%	N	%	N	%		
Registered pests and diseases on the field	152	52.6%	67	54.9%	121	56.5%	98	49.7%	219	53.3%
Elements recalls on control of pests and diseases										
Cultural methods like crop rotation, fallowing	249	84.1%	88	72.7%	146	67.6%	191	95.0%	337	80.8%
Use of organic methods like tobacco, soap, chilly	261	88.2%	99	81.8%	174	80.6%	186	92.5%	360	86.3%
Chemical control as a last resort	254	85.8%	98	81.0%	170	78.7%	182	90.5%	352	84.4%
Use of a combination of methods	186	63.1%	49	40.5%	66	30.7%	169	84.1%	235	56.5%
New element learned about control of pests and diseases	194	66.2%	80	66.7%	166	78.3%	108	53.7%	274	66.3%
Correct pest and disease control observed in the field	168	56.4%	56	45.9%	91	44.4%	133	67.9%	224	55.9%

Over all, the occurrence of pests and diseases was mostly observed in the strategic crops of maize (59.4%), beans (56.1%) and groundnuts (50.0%). While the refugees registered pests and diseases mainly the fields for maize, beans and groundnuts; the hosts mainly experienced the pests and diseases in the strategic crops of Sesame, cassava and maize. The highest prevalence of pests and diseases in Adjumani was observed in Maize, beans and groundnuts while Obongi district experienced pest and diseases mainly in the strategic crops of beans, cassava and groundnuts.

Correct pests and disease control measures were observed in most fields for Groundnuts, cassava and maize as illustrated in the table 32 below.

**Table 32: Strategic crops that registered pests and diseases and correct control measures**

			SESAME		MAIZE		GNUTS		CASSAVA		BEANS	
			HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
Membership category	Refugee	Registered pest and disease	8	26.7%	66	57.9%	77	50.0%	7	43.8%	56	57.7%
		correct pest and disease control	12	40.0%	64	57.7%	107	70.9%	11	64.7%	38	40.0%
	Host	Registered pest and disease	3	75.0%	35	62.5%	22	50.0%	2	66.7%	40	54.1%
		correct pest and disease control	2	50.0%	22	44.9%	27	62.8%	2	66.7%	27	39.7%
District	ADIJUMANI	Registered pest and disease			72	64.9%	25	45.5%	2	33.3%	94	56.0%
		correct pest and disease control			46	45.1%	29	54.7%	4	66.7%	65	40.6%
	OBONGI	Registered pest and disease	11	32.4%	29	49.2%	74	51.7%	7	53.8%	2	66.7%
		correct pest and disease control	14	41.2%	40	69.0%	105	74.5%	9	64.3%		
Total	Registered pest and disease	11	32.4%	101	59.4%	99	50.0%	9	47.4%	96	56.1%	
	correct pest and disease control	14	41.2%	86	53.8%	134	69.1%	13	65.0%	65	39.9%	

### 3.4.7 Soil Fertility and Water Management

According to the results, 94.2% of the mixed group members rated the fertility of the soils as good or very good. Sixty eight (68%) percent of the members indicated that the soils had always been fertile, and they had never experienced any soil fertility and water management related challenges on their fields even before joining NURI. Only 32% reported experiencing challenges with the fertility of the soils in their fields and water management before NURI CSA training. No significant variation of the results were noted across the membership categories and districts. To control further eroding of soils, members of refugee groups used terraces, constructed bands around their fields, dug trenches in the fields, used mulching and cover crops like groundnuts, crop rotation and fallowing. They also applied manure and buried grass in the fields to enable it to decompose underground.

For the topics covered in the session on preservation of soil fertility, at least 70% of the members of the Mixed groups reportedly recalled each of the 6 topics including mulching (93.8%), constructing terraces/bands/trenches (89%), crop rotation (77%), application of manures (71.8%), use of cover crops (71.5%) and fallowing of land (70.9%). However, less than 50% and 59% of the members of mixed groups could recall inoculation of legumes with rhizobia and application of inorganic fertilizers, respectively, as methods for improving soil fertility. The results also show that higher proportions of refugees recalled all the elements of soil fertility taught in the training than the hosts. Similarly, more residents of Obongi districts recalled all the elements of soil fertility taught in the training than the residents of Adjumani. The major difference in the level of recall across the membership category and the 2 districts existed in the elements of *inoculation of legumes with rhizobia, application of inorganic fertilizers, and application of manures.*

Adoption of measures for preserving and increase fertility of the soils were observed in-force on 79.7% of the members' fields surveyed. Twenty percent (20.3%) were not using any of the soil fertility and water management measures taught in the NURI CSA training in 2020 (see Table 33).

**Table 33: Soil fertility and water management on Mixed group members' fields**

		Membership category				District				Total	
		Refugee		Host		Adjumani		Obongi			
		N	%	N	%	N	%	N	%	N	%
Members' rating of soil fertility currently	Very poor	4	1.4%	1	0.8%	4	1.9%	1	0.5%	5	1.2%
	Poor	2	0.7%	1	0.8%	2	0.9%	1	0.5%	3	0.7%
	Fair	14	4.8%	2	1.6%	7	3.3%	9	4.5%	16	3.9%
	Good	147	50.5%	53	43.4%	58	27.1%	142	71.4%	200	48.4%
	Very good	124	42.6%	65	53.3%	143	66.8%	46	23.1%	189	45.8%
Farmers that experienced any soil fertility & water management challenges before NURI		96	32.7%	37	30.3%	79	36.9%	54	26.7%	133	32.0%
<b>Elements recalls on soil fertility sessions</b>											
Mulching		283	95.6%	109	89.3%	195	90.7%	197	97.0%	392	93.8%
Use of cover crops		227	76.7%	72	59.0%	103	47.9%	196	96.6%	299	71.5%
Inoculation of legumes with rhizobia		166	56.1%	26	21.3%	13	6.0%	179	88.2%	192	45.9%
Crop rotation		240	81.1%	82	67.2%	126	58.6%	196	96.6%	322	77.0%
Constructing terraces, bands, trenches		267	90.2%	105	86.1%	180	83.7%	192	94.6%	372	89.0%
Fallowing of land		214	72.3%	81	66.4%	107	49.8%	188	92.6%	295	70.6%
Application of manures		229	77.4%	71	58.2%	113	52.6%	187	92.1%	300	71.8%
Application of inorganic fertilizers		195	66.1%	51	41.8%	69	32.2%	177	87.2%	246	59.0%

Element under soil fertility and water management that was new	193	65.2%	82	67.8%	166	77.6%	109	53.7%	275	65.9%
Soil fertility management observed in the field	238	79.9%	88	72.1%	159	73.6%	167	86.5%	326	79.7%

By type of strategic crop planted, nearly all farmers of the various strategic crops affirmed that the fertility of their soils was either good or very good. This rating was reported by farmers growing cassava (100%), maize (94.2%), beans (94.1%), groundnuts (92.4%) and Sesame (91.2%). Slightly above 33% of the members of Mixed groups reported to have experienced soil fertility and water management challenges for each of the strategic crops except sesame. About adoption of the practices, results showed that correct soil fertility and water management measures were observed on majority of farmers' fields (over 72%) irrespective of type of strategic crop planted. See table 34 below.

**Table 34: Experience of soil fertility challenges and observed correct measures by type of crop**

	Rate the fertility of the soil in the field										Experienced soil fertility & water management challenges	New element learnt under soil fertility and water management		Soil fertility management observed in the field		
	Very poor		Poor		Fair		Good		Very good			N	%	N	%	
	N	%	N	%	N	%	N	%	N	%						
SESAME	0	0.0%	0	0.0%	3	8.8%	17	50.0%	14	41.2%	8	24.2%	22	64.7%	32	94.1%
MAIZE	2	1.2%	1	0.6%	7	4.0%	59	34.1%	104	60.1%	59	34.1%	125	72.3%	147	87.0%
GROUNDNUTS	3	1.5%	2	1.0%	10	5.1%	128	65.0%	54	27.4%	67	33.5%	120	59.7%	161	83.0%
CASSAVA	0	0.0%	0	0.0%	0	0.0%	7	36.8%	12	63.2%	7	35.0%	15	75.0%	17	94.4%
BEANS	2	1.2%	1	0.6%	7	4.1%	44	25.7%	117	68.4%	58	33.7%	136	79.5%	125	72.3%

### 3.4.8 Post Harvest Handling and Value Addition

As earlier noted, most members of the Mixed groups planted mostly beans, groundnuts, maize, beans and sesame in season B of 2020. Only two (2) HHs reported to have planted cassava and one (1) HH planted soyabeans. Generally, members of the Mixed groups cultivated small plots of land ranging between 0.5 – 0.7 acres. The mean acreage of land cultivated by people who planted beans and soyabeans was 0.5 acres. Groundnuts, cassava and maize were grown on an average land of 0.6 acres each while sesame growers cultivated the largest land of 0.7 acres on average. In the 2020 season, members of the mixed groups that planted beans recorded the highest yield of 2,696kgs/acre on average, having planted an average of 27.1kgs of seed per acre. Maize was the second productive crop with yield of 580.8kgs/acre on average after planting 20.7kgs of seed per acre on average. Sesame had the least yield of 169kgs/acre with 6.0kgs of seed planted per acre. The results also revealed that refugees had higher yield for the strategic crops except cassava than the hosts. Similarly, Adjumani district had higher crop yield for Maize and groundnuts than in Obongi district. See Table 35.

**Table 35: Quantity harvested, sold and consumed from strategic crops planted in 2020**

		Strategic crop	Land size (in acres)		Quantity of seed used (Kgs) perAcre		Yield (Kgs) per acre (Kgs/Acre)		Percentage (%) of harvest sold		Percentage (%) of harvest consumed	
			HHs	Mean	HHs	Mean	HHs	Mean	HHs	Mean	HHs	Mean
Membership category	Refugee	SESSAME	25	0.6	24	6.3	19	174.5	15	70.0	9	62.8
		MAIZE	126	0.5	123	24.9	112	697.7	65	48.2	117	72.6
		GNUTS	145	0.6	142	45.8	132	375.1	80	54.4	110	74.4
		CASSAVA	1	0.9	1	3.9						
		BEANS	117	0.5	117	31.9	96	4,040.7	55	48.9	95	64.5
	Host	SOYBEAN	1	0.5	1	12.0	1	520.0	1	50.0	1	50.0
		SESSAME	2	0.8	2	2.3	2	120.0	2	75.0	1	50.0
		MAIZE	52	0.7	52	10.6	46	296.0	30	48.2	48	71.9
		GNUTS	39	0.6	39	24.6	37	200.3	20	56.2	30	66.7
		BEANS	71	0.6	70	18.9	53	260.1	46	51.7	58	60.6
District	ADJUMANI	SOYBEAN	1	0.5	1	12.0	1	520.0	1	50.0	1	50.0
		MAIZE	134	0.6	134	15.1	117	486.8	75	46.0	126	72.4
		GNUTS	60	0.5	60	47.4	52	312.3	32	60.3	48	91.7
		CASSAVA	2	0.6	1	3.9						
	OBONGI	BEANS	188	0.5	187	27.1	149	2,695.9	101	50.2	153	63.0
		SESSAME	27	0.7	26	6.0	21	169.3	17	70.6	10	61.5
		MAIZE	44	0.6	41	38.7	41	849.0	20	56.5	39	72.4
Total		GNUTS	124	0.6	121	38.1	117	347.8	68	52.1	92	62.8
		SOYBEAN	1	0.5	1	12.0	1	520.0	1	50.0	1	50.0
		SESSAME	27	0.7	26	6.0	21	169.3	17	70.6	10	61.5
		MAIZE	178	0.6	175	20.7	158	580.8	95	48.2	165	72.4
		GNUTS	184	0.6	181	41.2	169	336.9	100	54.7	140	72.7
		CASSAVA	2	0.6	1	3.9						
	BEANS	188	0.5	187	27.1	149	2,695.9	101	50.2	153	63.0	

Mixed group members practiced both subsistence and commercial farming. Some farmers were purely subsistence, only selling the excess produce. Results showed that while farmers consumed most of their produce (over 50%) for various crops in 2020, notable proportion of their produce for various crops were also marketed. Apart from Maize and Cassava, the proportion of quantities of different crops sold were more than 50% while on average, over 50% of the produce of the same crops were consumed

From the harvest sold, the total mean amount of money earned per HH for the mixed group was UGx182,100=. While the host farmers earned more amount of money (UGx190,200) from the sale of strategic crops than the refugees (Ugx177,800=), Adjumani district earned UGx 191,700/= which was slightly higher than the mean amount (UGx 160,400/=) earned by Mixed group members in Obongi. The highest amount earned from a single crop was obtained from beans and groundnuts in both Adjumani and Obongi districts. While the 2 districts earned the least amount of money from the sale of maize, Adjumani earned (Ugx166,800=) almost twice the amount of money earned by Obongi (Ugx85,950) from the sale of maize. From the results, both the hosts and refugees earned most from sale of beans (Ugx240,800= and Ugx192,000= respectively). However, the hosts earned least from sale of maize (Ugx108,600=) and the refugees earned least from sales of Sesame (Ugx150,000=) ( see Table 36).

**Table 36: Mean value of produce/strategic crops marketed in 2020**

		Strategic Crop	Number	Mean value (Ugx)
Membership category	Refugee	SESAME	14	150,500
		MAIZE	55	182,500
		GROUNDNUTS	69	168,000
		BEANS	57	192,000
		<b>Total</b>	<b>195</b>	<b>177,800</b>
	Host	SESAME	3	123,300
		MAIZE	33	108,600
		GROUNDNUTS	19	219,800
		BEANS	46	240,800
		<b>Total</b>	<b>101</b>	<b>190,200</b>
District	ADJUMANI	MAIZE	75	166,800
		GROUNDNUTS	29	181,500
		BEANS	101	213,100
		<b>Total</b>	<b>205</b>	<b>191,700</b>
	OBONGI	SESAME	17	145,700
		MAIZE	13	85,950
		GROUNDNUTS	59	178,000
		BEANS	2	250,000
		<b>Total</b>	<b>91</b>	<b>160,400</b>
	<b>Total</b>	SESAME	17	145,700
MAIZE		88	154,800	
GROUNDNUTS		88	179,200	
BEANS		103	213,800	
<b>Overall</b>		<b>296</b>	<b>182,100</b>	

Over 83% respondents correctly recalled 8 out of 10 elements of guidance provided during the training. About 3 in every 4 respondents could recall correctly the remaining 2 elements namely “*Storage pests and their control*” (73.2%) and “*causes of PHH losses*” (75.4%). Higher proportion of members in Obongi (over 92%) could recall the elements than those in Adjumani district (52-89%). Similarly, more refugees (77-94%) recalled the elements taught during the training than the hosts (59-93%). While 50% of the members who attended the training learnt new elements, more residents of Obongi (62.9%) than in Adjumani (37.9%) and more hosts (52.6%) than refugees acknowledged having learnt new elements. Results showed that PHH measures had been applied by 80.6% of the members surveyed, with equal proportions of members in both districts and slightly more refugees (83.3%) than hosts (73.3%). Slightly more than half (51.6%) of the members carried out value addition before marketing with higher proportion in Obongi (68.9%) than Adjumani (36.8%) and more refugees (53.4%) than hosts (47.3%) (See table 37 below).

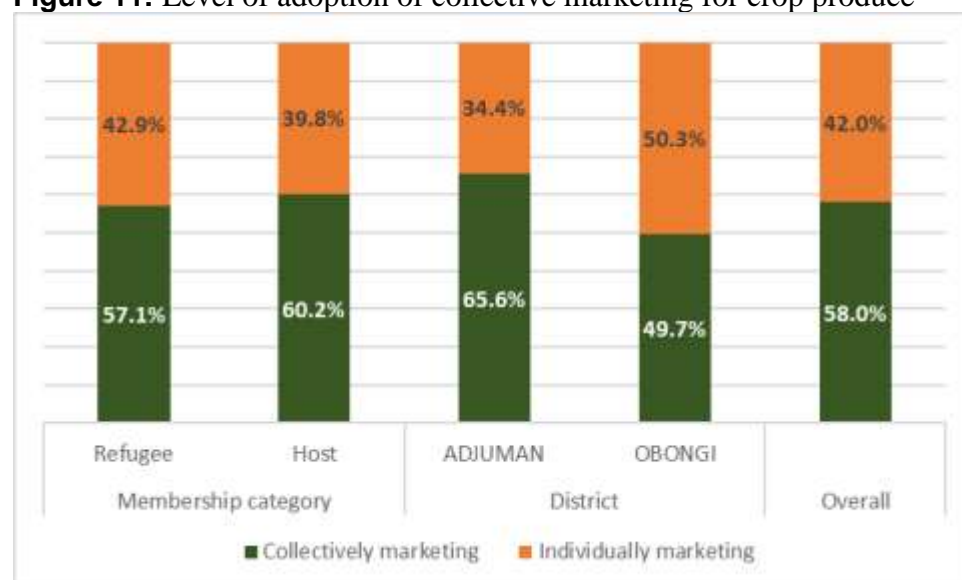
**Table 37: Level of recall of topics on PHH and value addition among mixed groups by district**

	Membership category				District				Total	
	Refugee		Host		ADJUMANI		OBONGI		N	%
	N	%	N	%	N	%	N	%		
Major elements recalled about post-harvest handling from the CSA training attended under NURI										
Indicators of crop maturity	260	92.5%	101	86.3%	169	82.0%	192	100.0%	361	90.7%
Causes of PHH losses	242	82.0%	71	59.2%	111	52.1%	202	100.0%	313	75.4%
Methods of harvesting	263	88.6%	94	77.7%	157	72.7%	200	99.0%	357	85.4%
Threshing/shelling	252	84.8%	98	81.0%	152	70.4%	198	98.0%	350	83.7%
Proper drying	277	93.3%	112	92.6%	192	88.9%	197	97.5%	389	93.1%
Cleaning	278	93.6%	103	85.1%	182	84.3%	199	98.5%	381	91.1%
Grading/sorting out pallets	257	86.5%	101	82.8%	165	76.0%	193	95.5%	358	85.4%
Storing of produce and methods	262	88.2%	101	83.5%	172	79.6%	191	94.6%	363	86.8%
Storage pests and their control	230	77.4%	76	62.8%	120	55.6%	186	92.1%	306	73.2%
Clean store or none leaking roof	258	86.9%	97	80.2%	162	75.0%	193	95.5%	355	84.9%
New Elements under PHH during the CSA training	136	48.9%	61	52.6%	122	62.2%	75	37.9%	197	50.0%
Applied harvest handling measures during and after harvesting	229	83.3%	82	73.9%	170	79.4%	141	82.0%	311	80.6%
Carried out value addition to crop before marketing	151	53.4%	53	47.3%	78	36.8%	126	68.9%	204	51.6%

### 3.4.9 Marketing produce

Overall, 58% of the Mixed group members sold their produce as a group and 42% sold their produce individually, indicating a low level of collective marketing. Overall, higher proportion of mixed group members that marketed crop produce collectively were in Adjumani district (65.6%) than those in Obongi district (less than 50%). Similarly, more host members sold the crop produce collectively than the refugees (57.1%). Similar trend is reflected in the individual strategic crops. Refer to figure 12.

**Figure 11: Level of adoption of collective marketing for crop produce**



Analysis of data revealed that highest proportion of mixed group members who sold their produce collectively were growing cassava (84.2%). Other strategic crops where notable proportions of farmers sold crop produce collectively were beans (62.4%) and maize (61.5%). The proportions of farmers

growing sesame and groundnuts that marketed the crop produce collectively were 54.5% and 53.6% respectively. The results also show that more host farmers marketed cassava (100%) and sesame (75%) collectively than the refugees (82.4% and 51.7% respectively). Furthermore, higher proportions of mixed group members in Adjumani collectively marketed the produce for maize (67.3%), groundnuts (67.3%), cassava (100.0%) and beans (63.5%) than their counterparts in Obongi district (51.6%, 48.6%, 76.9% and 0.0% respectively). See Table 39.

**Table 38: Marketing by type of strategic crop planted**

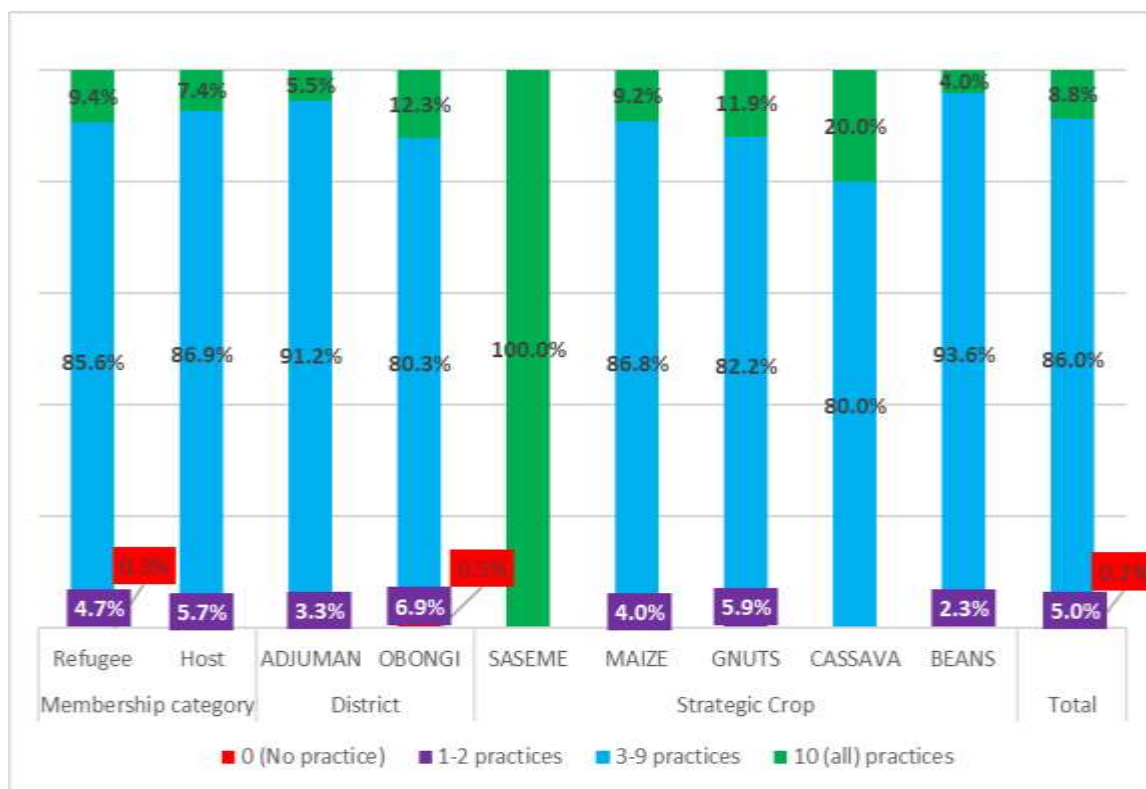
			Applied post-harvest handling measures		Carried out value addition to crop before marketing or storage		Learnt new elements under PHH in the CSA training		Way of marketing produce			
									Collectively		Individually	
			N	%	N	%	N	%	N	%	N	%
Membership category	Refugee	SESAME	18	62.1%	19	63.3%	19	63.3%	15	51.7%	14	48.3%
		MAIZE	96	86.5%	48	42.5%	60	56.1%	70	61.4%	44	38.6%
		GNUTS	121	86.4%	93	61.6%	59	39.1%	82	53.9%	70	46.1%
		CASSAVA	15	100.0%	5	29.4%	5	29.4%	14	82.4%	3	17.6%
		BEANS	85	86.7%	32	33.3%	54	64.3%	59	60.8%	38	39.2%
	Host	SESAME	2	66.7%	1	33.3%	3	75.0%	3	75.0%	1	25.0%
		MAIZE	40	71.4%	23	41.1%	32	60.4%	34	61.8%	21	38.2%
		GNUTS	28	77.8%	18	50.0%	17	39.5%	22	52.4%	20	47.6%
		CASSAVA	3	100.0%	1	50.0%	1	50.0%	2	100.0%	0	0.0%
		BEANS	53	73.6%	30	40.5%	42	60.9%	47	64.4%	26	35.6%
District	ADJUMANI	SESAME	0		0	0.0%	0	0.0%	0	0.0%	0	0.0%
		MAIZE	84	75.7%	32	29.4%	69	71.1%	72	67.3%	35	32.7%
		GNUTS	46	83.6%	17	31.5%	26	53.1%	35	67.3%	17	32.7%
		CASSAVA	6	100.0%	1	16.7%	2	33.3%	6	100.0%	0	0.0%
		BEANS	135	80.8%	61	36.5%	95	63.3%	106	63.5%	61	36.5%
	OBONGI	SESAME	20	62.5%	20	60.6%	22	64.7%	18	54.5%	15	45.5%
		MAIZE	52	92.9%	39	65.0%	23	36.5%	32	51.6%	30	48.4%
		GNUTS	103	85.1%	94	70.7%	50	34.5%	69	48.6%	73	51.4%
		CASSAVA	12	100.0%	5	38.5%	4	30.8%	10	76.9%	3	23.1%
		BEANS	3	100.0%	1	33.3%	1	33.3%	0	0.0%	3	100.0%
Total	SESAME	20	62.5%	20	60.6%	22	64.7%	18	54.5%	15	45.5%	
	MAIZE	136	81.4%	71	42.0%	92	57.5%	104	61.5%	65	38.5%	
	GNUTS	149	84.7%	111	59.4%	76	39.2%	104	53.6%	90	46.4%	
	CASSAVA	18	100.0%	6	31.6%	6	31.6%	16	84.2%	3	15.8%	
	BEANS	138	81.2%	62	36.5%	96	62.7%	106	62.4%	64	37.6%	

### 3.4.10 Adoption of CSA practices by mixed group members

Overall, less than 9%) of the mixed group members' HHs adopted all the 10 CSA practices covered during the NURI training while only 0.2% of the HHs did not implement any practice. Notably, 94.8% of the mixed group members adopted at least 3 CSA practices learnt during the training, indicating a very high degree of adoption for the CSA practices in the mixed groups. Regarding the district differentials, Adjumani district had slightly higher proportion of HHs that adopted at least 3 CSA practices (96.7%) than Obongi district (92.6%). Furthermore, slightly more refugees (95%) adopted at least 3 CSA practices than the hosts (94.3%). All households (100%) that grew sesame and cassava adopted at least 3 CSA practices compared to over 94% of the growers of groundnuts, maize and beans who adopted the same number of practices. See figure 13.



**Figure 12: Proportion of households that adopted CSA practices by district and level of adoption**



#### 4.0 FACTORS INFLUENCING ADOPTION OF CSA PRACTICES

The study also asked the respondents to identify the factors that influence the adoption of the practices learnt by farmers in their community during the NURI CSA training. The following were the issues pointed out by various farmers during the study.

1. Some farmers perceive the new practices learnt in the NURI training as labour intensive and yet the farmers experience shortage of manpower to work in their fields.

*“With broadcasting of sesame, we used to do first ploughing and then plant simultaneously with second ploughing. But for line planting we were told to do first and second ploughing separately and then plant on a separate day which is labour intensive”*

2. Continuous support supervision/mentorship to the farmers after training to provide an opportunity for the farmers clearly understand all the new issues and ensure that the farmers translate their knowledge gained during training into practice.

*“For us to adopt new elements, we need to be trained continuously on the same thing until members learn and copy”*

3. Some respondents reportedly faced shortage of land for cultivation, and they had no money for renting land. This applied especially to the refugees

4. Some farmers adopted the new practices learnt during the training and their crop yield tremendously reduced. They decided to revert to their traditional farming practices.

*“We saw the difference between sesame planted in line and that not planted in line, the one not in line yielded better than the one planted in line. So, we doubt line planting”*

5. Unfavourable climatic conditions such as dry spells and/or rains coming late in some areas affected the adoption of the new practices

6. Environmental degradation in the areas through deforestation has discouraged the farmers from adopt the new practices learnt from NURI CSA training.

*“If we continue to cut trees, we will continue to have poor yield even if we apply the knowledge from the training”*

7. Negative attitudes or mindset among farmers towards the new practices learnt during the training has negative impact on the adoption the practices

*“Some laziness makes some people not to copy and adopt the practices.”*

*“Some members don’t pay much attention to new practices”*

8. Some farmers complained about the need to prepare fine seedbeds to get the required seedlings which they feel is hard and hence they have not adopted the new practices in the community

9. Some farmers lack resources to buy the required inputs to use when the adopt the new practices

10. Some soil conditions do not favour use of some new practices. For instance, sandy soils do not favour line planting.

*“.. If we plant sesame in line on sandy soil, sun affects it too much. [So, they continued with broadcasting to plant sesame]”*

## 5.0 CONCLUSION AND RECOMMENDATIONS

### 5.1 Conclusion

Overall, 99.5% of new nationals farmer group members and all (100%) Mixed group members covered in the study attended the NURI CSA training. Thirty nine percent (39%) of the new nationals fully attended all the 10 training sessions and 55% fully attended between 5 and 9 sessions while 6% fully attended less than 5 sessions. Majority (51%) of the mixed groups fully attended all the 10 sessions while 45% fully attended 5 to 9 sessions and only 4% fully attended less than 5 sessions. Regarding attendance of individual sessions, all the sessions (except business skills for new nationals) were fully attended by 75% to 95% of the farmers in both new nationals and mixed groups. Only 66% of the new national farmer group members fully attended the session on business skills. No session was fully attended by all members of the farmers groups. Majority of the famers among new nationals (84.8%) and mixed groups (82.8%) found the timing of the training sessions, the farming calendar and duration of the sessions as appropriate. Thus, it may be necessary to organize a refresher training to support the farmers after 1 year of implementation.

Adoption of the new CSA practices covered during CSA training was high in both new nationals and mixed groups. Seventy two percent (72%) of the new nationals and 86.7% of the mixed group members implemented at least 5 CSA practices learnt during the training. The practices where adoption was observed with high proportions (over 71%) of farmers' fields included *good seedbed preparation, use of improved seeds, soil fertility management, post-harvest handling measures, correct weeding*. The adoption of *line planting and correct spacing, correct pest and disease control, collectively marketing, carried out value addition and recommended intercropping* remains low (less than 61%). Land tillage was still predominantly reliant on the hand-hoe, few farmers had adopted mechanized methods such as animal traction or the tractor. The acreage of land cultivated was still small, the mean size for most HHs for both nationals and mixed groups was not exceeding 0.9 acres.

### 5.2 Recommendations

Based on the findings, the following suggestions are made to ensure the programme attains all its objectives and to inform future programming.

- There is need to revisit the training plans and carry out consultations to understand why there was no universal attendance of the sessions. NURI needs to ensure that all targeted farmers fully attend all sessions with undivided attention.
- NURI need to hold refresher trainings with all farmers on all sessions/topics where adoption of the new farming practices is generally low.
- Intensify support supervision and coaching visits to farmers' fields to observe and encourage adoption of the various CSA practices right from seedbed preparation to Post-harvesting handling (PHH).
- Support the farmers' groups to have exchange visits among the groups to allow them exchange ideas and experiencing across districts/sub counties
- Members of farmers groups should be supported to explore opportunities for increasing the acreage of land cultivated. Sub-county staff should be engaged to help farmers identify large chunks of land that can used by the groups.
- Members of the various farmers' groups should be encouraged and supported to grow a common strategic crop to ensure the quantities that support collective marketing are readily available.
- Support farmers to adopt modern methods of tilling land reducing reliance on the hand hoe.
- Support members of the farmers groups to access machinery for value addition.

**Appendix: Analysis of Mixed Group data by districts by membership categories for various variables**

**Socio-demographic characteristics of members of Mixed groups surveyed**

		ADJUMANI				OBONGI			
		Refugee		Host		Refugee		Host	
		Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Sex of the respondent	Male	39	31.0%	42	46.2%	59	34.3%	13	41.9%
	Female	87	69.0%	49	53.8%	113	65.7%	18	58.1%
Age of the respondent	18-28	30	23.8%	33	36.3%	29	16.9%	8	25.8%
	29-38	47	37.3%	25	27.5%	81	47.1%	10	32.3%
	39-48	25	19.8%	20	22.0%	41	23.8%	7	22.6%
	49+	24	19.0%	13	14.3%	21	12.2%	6	19.4%
Highest level of education for the respondent	No formal education	17	13.5%	9	9.9%	35	20.6%	6	19.4%
	Attended lower level primary education (P.1 – P.4)	29	23.0%	27	29.7%	42	24.7%	10	32.3%
	Attended upper level primary education (P.5 – P.7)	48	38.1%	41	45.1%	51	30.0%	6	19.4%
	Attended O-level (S1-S4)	28	22.2%	12	13.2%	39	22.9%	6	19.4%
	Attended A-level (S5-S6)	0	0.0%	0	0.0%	1	0.6%	0	0.0%
	Tertiary Institution	4	3.2%	2	2.2%	2	1.2%	2	6.5%
	University Education	0	0.0%	0	0.0%	0	0.0%	1	3.2%
Main occupation of the respondent:	OTHERS	2	1.6%	0	0.0%	3	1.8%	1	3.3%
	FARMING	121	96.8%	88	97.8%	165	98.2%	29	96.7%
	BUSINESS	2	1.6%	2	2.2%	0	0.0%	0	0.0%
Category of the household	Male headed	57	45.2%	70	76.9%	108	62.8%	19	61.3%
	Female headed	69	54.8%	21	23.1%	64	37.2%	12	38.7%
Age of the Household head	18-28	14	11.8%	18	20.7%	22	12.9%	6	19.4%
	29-38	45	37.8%	29	33.3%	70	40.9%	6	19.4%
	39-48	27	22.7%	19	21.8%	56	32.7%	12	38.7%
	49+	33	27.7%	21	24.1%	23	13.5%	7	22.6%

## Mixed groups that had good governance structures prior to the CSA training

	ADJUMANI				OBONGI				
	Refugee		Host		Refugee		Host		
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	
Clear goal/objective/plan	43	39.1%	27	36.0%	64	38.8%	16	55.2%	
Constitution & if members abide by it	42	38.2%	25	33.3%	64	39.0%	16	55.2%	
Leadership & if they were elected	42	38.2%	28	37.3%	63	38.4%	16	55.2%	
Proper records/documentation of group activities	42	38.2%	28	37.3%	63	38.4%	16	55.2%	
Regular meetings & attendance by members	42	38.2%	27	36.0%	62	38.0%	16	55.2%	
Group Chairperson	Male	76	60.8%	62	68.1%	154	90.1%	24	77.4%
	Female	49	39.2%	29	31.9%	17	9.9%	7	22.6%
Vice Chairperson	Male	52	45.6%	37	44.6%	73	42.9%	15	48.4%
	Female	62	54.4%	46	55.4%	97	57.1%	16	51.6%
Treasurer	Male	8	6.5%	4	4.4%	28	16.4%	4	12.9%
	Female	116	93.5%	87	95.6%	143	83.6%	27	87.1%
Secretary	Male	93	74.4%	74	81.3%	106	62.0%	23	74.2%
	Female	32	25.6%	17	18.7%	65	38.0%	8	25.8%
Publicity/Mobiliser	Male	74	62.7%	65	75.6%	122	71.8%	13	43.3%
	Female	44	37.3%	21	24.4%	48	28.2%	17	56.7%
Security	Male	86	83.5%	79	94.0%	104	81.9%	14	66.7%
	Female	17	16.5%	5	6.0%	23	18.1%	7	33.3%
Others	Male	2	25.0%	2	25.0%	0	0.0%	0	0.0%
	Female	6	75.0%	6	75.0%	1	100.0%	1	100.0%

## Participation in CSA training and sessions attended either fully or partially

	ADJUMANI District				OBONGI District				
	Refugee		Host		Refugee		Host		
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	
Received training on CSA from NURI extension staff in 2020	126	100.0%	90	100.0%	171	100.0%	31	100.0%	
NURI CSA training was the first extension training group received	113	90.4%	81	90.0%	168	98.8%	30	96.8%	
Source of training	NGO	12	100.0%	7	100.0%	1	100.0%	1	100.0%
	Government			1	100.0%				
	Others					1	100.0%		
Setting ground rules	Fully	103	81.7%	78	85.7%	154	89.5%	27	87.1%
	Partially	5	4.0%	2	2.2%	2	1.2%		
	Not at all	18	14.3%	11	12.1%	16	9.3%	4	12.9%
Climate, climate Change & impact	Fully	97	77.0%	67	73.6%	161	93.6%	29	93.5%
	Partially	5	4.0%	5	5.5%	2	1.2%		
	Not at all	24	19.0%	19	20.9%	9	5.2%	2	6.5%
CSA practices & technologies	Fully	110	87.3%	72	79.1%	158	91.9%	30	96.8%
	Partially	4	3.2%	3	3.3%	3	1.7%		
	Not at all	12	9.5%	16	17.6%	11	6.4%	1	3.2%
Enterprise selection for groups	Fully	98	79.0%	76	83.5%	164	95.3%	30	96.8%
	Partially	9	7.3%	4	4.4%	1	0.6%		
	Not at all	17	13.7%	11	12.1%	7	4.1%	1	3.2%
Seed bed preparation, planting, intercropping & weeding	Fully	117	92.9%	85	93.4%	166	96.5%	28	90.3%
	Partially	6	4.8%	6	6.6%	4	2.3%	1	3.2%
	Not at all	3	2.4%	0	0.0%	2	1.2%	2	6.5%
Pests & disease control	Fully	102	81.6%	71	78.0%	163	94.8%	29	93.5%

	Partially	6	4.8%	2	2.2%	1	0.6%	1	3.2%
	Not at all	17	13.6%	18	19.8%	8	4.7%	1	3.2%
Soil fertility & water management	Fully	99	79.2%	66	73.3%	164	95.3%	30	96.8%
	Partially	6	4.8%	2	2.2%	1	0.6%		
	Not at all	20	16.0%	22	24.4%	7	4.1%	1	3.2%
Post-harvest handling & value addition	Fully	111	88.8%	72	79.1%	168	97.7%	30	96.8%
	Partially	2	1.6%	2	2.2%	2	1.2%	1	3.2%
	Not at all	12	9.6%	17	18.7%	2	1.2%		
Business skills	Fully	78	61.9%	61	67.8%	155	90.1%	18	58.1%
	Partially	10	7.9%	4	4.4%	3	1.7%	3	9.7%
	Not at all	38	30.2%	25	27.8%	14	8.1%	10	32.3%
Marketing	Fully	85	67.5%	63	70.8%	156	91.2%	18	62.1%
	Partially	12	9.5%	4	4.5%	0	0.0%	2	6.9%
	Not at all	29	23.0%	22	24.7%	15	8.8%	9	31.0%

### Members of Mixed groups rating of relevance of the CSA training sessions

		ADJUMANI District				OBONGI District			
		Refugee		Host		Refugee		Host	
		Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Rating of time allocated to each CSA training session	Too short	11	8.7%	6	6.6%	21	12.7%	6	20.0%
	Too long	7	5.6%	8	8.8%	11	6.6%	1	3.3%
	Appropriate	108	85.7%	77	84.6%	134	80.7%	23	76.7%
Rating of the timing of the training vis-à-vis farming calendar	Very Good	71	58.7%	51	58.0%	46	27.4%	6	20.0%
	Good	39	32.2%	28	31.8%	117	69.6%	23	76.7%
	Fair	7	5.8%	5	5.7%	5	3.0%	1	3.3%
	Poor	4	3.3%	4	4.5%	0	0.0%	0	0.0%
Rating of the training methods used	Very Good	79	65.3%	60	70.6%	63	38.0%	7	24.1%
	Good	39	32.2%	24	28.2%	101	60.8%	22	75.9%
	Fair	3	2.5%	1	1.2%	2	1.2%	0	0.0%
	Poor	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Climate, climate Change & impact	Very relevant	100	82.6%	73	83.9%	158	94.6%	30	96.8%
	Fairly relevant	6	5.0%	1	1.1%	2	1.2%	0	0.0%
	Not relevant	15	12.4%	13	14.9%	7	4.2%	1	3.2%
CSA practices & technologies	Very relevant	104	83.9%	73	83.9%	157	94.6%	29	93.5%
	Fairly relevant	9	7.3%	3	3.4%	1	0.6%	1	3.2%
	Not relevant	11	8.9%	11	12.6%	8	4.8%	1	3.2%
Enterprise selection for groups	Very relevant	104	86.0%	75	88.2%	162	95.3%	29	93.5%
	Fairly relevant	8	6.6%	8	9.4%	4	2.4%	0	0.0%
	Not relevant	9	7.4%	2	2.4%	4	2.4%	2	6.5%
Seed bed preparation, planting, intercropping & weeding	Very relevant	121	96.8%	85	95.5%	162	95.3%	31	100.0%
	Fairly relevant	3	2.4%	4	4.5%	6	3.5%	0	0.0%
	Not relevant	1	0.8%	0	0.0%	2	1.2%	0	0.0%
Pests & disease control	Very relevant	98	80.3%	63	74.1%	160	94.1%	29	93.5%
	Fairly relevant	18	14.8%	12	14.1%	3	1.8%	0	0.0%
	Not relevant	6	4.9%	10	11.8%	7	4.1%	2	6.5%
Soil fertility & water management	Very relevant	94	77.7%	60	71.4%	162	95.3%	29	93.5%
	Fairly relevant	18	14.9%	11	13.1%	3	1.8%	1	3.2%
	Not relevant	9	7.4%	13	15.5%	5	2.9%	1	3.2%
Post-harvest handling & value addition	Very relevant	109	90.1%	74	89.2%	161	94.7%	31	100.0%
	Fairly relevant	6	5.0%	5	6.0%	4	2.4%	0	0.0%
	Not relevant	6	5.0%	4	4.8%	5	2.9%	0	0.0%

		ADJUMANI District				OBONGI District			
		Refugee		Host		Refugee		Host	
		Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Business skills	Very relevant	77	64.2%	57	69.5%	147	86.0%	18	58.1%
	Fairly relevant	18	15.0%	10	12.2%	10	5.8%	3	9.7%
	Not relevant	25	20.8%	15	18.3%	14	8.2%	10	32.3%
Marketing	Very relevant	82	68.3%	61	74.4%	145	84.8%	19	61.3%
	Fairly relevant	16	13.3%	5	6.1%	11	6.4%	3	9.7%
	Not relevant	22	18.3%	16	19.5%	15	8.8%	9	29.0%
Extent the training improved members agricultural production knowledge	No change	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Little extent	1	0.8%	4	4.5%	7	4.2%	0	0.0%
	Moderate extent	29	23.2%	27	30.7%	85	51.2%	21	72.4%
	A large extent	95	76.0%	57	64.8%	74	44.6%	8	27.6%
Would recommend other farmers to attend a similar training		122	99.2%	90	100.0%	166	99.4%	29	96.7%

### Proportion of households that grew strategic crops for the first time

District	Strategic crop	Land size (in acres)						Grown for first time					
		Refugee		Host		Total		Refugee		Host		Total	
		HHs	Mean	HHs	Mean	HHs	Mean	HHs	%	HHs	%	HHs	%
ADJUMANI	SESAME	1	0.2	0	.	1	.	1	100.0%	0	0.0%	1	100.0%
	MAIZE	71	15.3	57	0.7	128	8.8	16	22.5%	5	8.8%	21	17.1%
	GROUNDNUTS	41	0.5	26	0.7	67	0.6	7	17.1%	3	11.5%	10	15.2%
	CASSAVA	4	0.8	2	0.7	6	0.7	0	0.0%	0	0.0%	0	0.0%
	BEANS	137	7.6	98	0.6	235	4.6	40	29.2%	13	13.3%	53	22.9%
OBONGI	SESAME	59	0.5	6	0.6	65	0.5	13	22.4%	1	16.7%	14	21.9%
	MAIZE	64	0.6	7	0.6	71	0.6	14	24.6%	0	0.0%	14	22.2%
	GROUNDNUTS	140	0.6	26	0.6	166	0.6	28	21.2%	3	12.0%	31	19.7%
	CASSAVA	13	0.4	1	0.5	14	0.4	1	9.1%	0	0.0%	1	8.3%
	BEANS	2	0.5	1	0.5	3	0.5	1	50.0%	0	0.0%	1	33.3%
Total	SESAME	60	0.5	6	0.6	66	0.5	14	23.7%	1	16.7%	15	23.1%
	MAIZE	135	8.1	64	0.7	199	5.7	30	23.4%	5	7.9%	35	18.8%
	GROUNDNUTS	181	0.5	52	0.7	233	0.6	35	20.2%	6	11.8%	41	18.4%
	CASSAVA	17	0.5	3	0.6	20	0.5	1	6.7%	0	0.0%	1	5.6%
	BEANS	139	7.5	99	0.6	238	4.6	41	29.5%	13	13.1%	54	23.1%

### Acquisition of land cultivated by household in 2020 and 2021 production cycle

	ADJUMANI District								OBONGI District							
	Refugee				Host				Refugee				Host			
	Year 2020		Year 2021		Year 2020		Year 2021		Year 2020		Year 2021		Year 2020		Year 2021	
Allocated by OPM		0.0%	1	0.8%		0.0%	0	0.0%	35	20.3%	34	19.8%	1	3.2%	1	3.2%
Borrowed from mixed groups	12	9.5%	16	12.7%		0.0%	0	0.0%	29	16.9%	31	18.0%	4	12.9%	7	22.6%
Borrowed from non-group members	16	12.7%	23	18.3%	2	2.2%	3	3.3%	12	7.0%	22	12.8%	3	9.7%	6	19.4%
Hired from group members	17	13.5%	15	11.9%	1	1.1%	1	1.1%	33	19.2%	33	19.2%		0.0%	0	0.0%
Hired from non-group members	57	45.2%	62	49.2%	2	2.2%	3	3.3%	48	27.9%	51	29.7%	2	6.5%	4	12.9%
Family owned	5	4.0%	8	6.3%	57	62.6%	76	83.5%	11	6.4%	11	6.4%	10	32.3%	10	32.3%
Communal owned	1	0.8%	2	1.6%	5	5.5%	7	7.7%		0.0%	0	0.0%	2	6.5%	2	6.5%

### Average size of cultivated land acquired from various sources

	Adjuman District				Obongi District			
	Refugees		Host		Refugees		Host	
	Year 2020	Year 2021	Year 2020	Year 2021	Year 2020	Year 2021	Year 2020	Year 2021
Allocated by OPM	0.00	0.31		0.00	0.38	0.39	0.25	0.25
Borrowed from mixed groups	0.50	0.70		0.00	0.45	0.45	0.26	0.38
Borrowed from non-group members	0.61	0.69	0.93	0.91	0.46	0.52	0.21	0.68
Hired from group members	0.43	0.68	1.00	1.00	0.71	0.75		0.00
Hired from non-group members	0.65	0.63	0.47	0.81	0.65	0.61	0.80	0.65
Family owned	1.00	0.99	0.94	1.25	0.69	0.70	1.32	1.35
Communal owned	0.80	0.42	0.31	0.65		0.00	0.50	0.50



### Application of CSA seedbed preparation practices by members of Mixed groups

	ADJUMANI District				OBONGI District			
	Refugee		Host		Refugee		Host	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Ways land was cleared for ploughing								
Burning field	8	6.3%	13	14.3%	8	4.7%	1	3.2%
Slashing	35	27.8%	11	12.1%	28	16.3%	9	29.0%
Cutting shrubs/trees	102	81.0%	81	89.0%	134	77.9%	21	67.7%
Spraying with herbicides	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Others	22	17.5%	11	12.1%	5	2.9%	0	0.0%
Methods used to till/plough the land								
Hoe	104	82.5%	83	91.2%	165	95.9%	25	80.6%
Animal traction	39	31.0%	26	28.6%	9	5.2%	5	16.1%
Tractor	3	2.4%	3	3.3%	1	0.6%	1	3.2%
Others	1	0.8%	0	0.0%	0	0.0%	0	0.0%
No. of times ploughed field before planting the strategic crop								
Once	8	6.4%	7	7.7%	22	12.9%	3	9.7%
Twice	106	84.8%	74	81.3%	132	77.6%	27	87.1%
Thrice	11	8.8%	10	11.0%	16	9.4%	1	3.2%
Elements of seedbed preparation recalled								
No burning of field	117	92.9%	84	92.3%	167	98.8%	29	93.5%
Proper selection of site considering fertility	88	69.8%	54	59.3%	161	94.2%	31	100.0%
Minimum soil disturbance	27	21.6%	27	29.7%	156	91.8%	30	96.8%
Minimal tree cutting	70	55.6%	58	63.7%	161	94.7%	30	96.8%
First and second tillage	119	94.4%	82	90.1%	162	95.3%	31	100.0%
Good seedbed preparation	100	80.0%	67	73.6%	169	99.4%	31	100.0%
New elements about seedbed preparation learnt in CSA training	104	88.9%	75	83.3%	70	42.9%	17	56.7%
Elements of good seedbed preparation could be observed in the fields	112	88.9%	77	84.6%	132	76.7%	24	77.4%

### Use of improved seed by mixed groups before and after joining NURI

	ADJUMANI District				OBONGI District			
	Refugee		Host		Refugee		Host	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<b>Seeds used to plant before joining NURI</b>								
Improved	26	21.5%	17	18.9%	8	4.7%	0	0.0%
Local	95	78.5%	73	81.1%	163	95.3%	31	100.0%
Both	0	0.0%	0	0.0%	0	0.0%	0	0.0%
<b>Type of seeds planted this year (2021)</b>								
Improved	126	100.0%	88	98.9%	163	98.8%	29	100.0%
Local	0	0.0%	1	1.1%	2	1.2%	0	0.0%
Both	0	0.0%	0	0.0%	0	0.0%	0	0.0%
<b>Source of the improved seeds planted</b>								
Home saved	1	0.8%	4	4.5%	10	6.1%	3	10.3%
Market	5	4.0%	12	13.3%	1	0.6%	0	0.0%
Demonstration plot	106	84.1%	77	87.5%	152	89.9%	27	87.1%
Operation Wealth Creation (OWC)	1	0.8%	0	0.0%	0	0.0%	0	0.0%
Other development partners	18	14.3%	8	9.1%	9	5.5%	1	3.4%
Input dealer	3	2.4%	4	4.5%	0	0.0%	0	0.0%
<b>Rating of germination of seeds used</b>								
Very good	99	79.2%	60	66.7%	55	33.3%	5	16.1%
Good	26	20.8%	25	27.8%	103	62.4%	25	80.6%
Fair	0	0.0%	4	4.4%	7	4.2%	1	3.2%
Poor	0	0.0%	1	1.1%	0	0.0%	0	0.0%
<b>Elements recalled on use of improved</b>								
Certified and viable	77	61.1%	51	56.0%	169	98.8%	31	100.0%
Clean/pure/uniform in size and colour	85	67.5%	57	62.6%	169	98.8%	30	96.8%
Wholesomeness	76	60.3%	51	56.0%	168	98.2%	29	93.5%
Pest and disease resistant	75	59.5%	44	48.4%	161	94.2%	31	100.0%
Drought tolerant	63	50.0%	49	53.8%	161	94.2%	31	100.0%
Early maturing and/or uniform in maturity	84	66.7%	56	61.5%	167	97.7%	29	93.5%
High yielding	109	86.5%	76	83.5%	160	93.6%	31	100.0%
Found new elements on use of improved seeds	101	80.8%	59	64.8%	90	52.9%	17	54.8%

Use of improved seeds observed in the field	118	93.7%	82	90.1%	155	90.1%	31	100.0%
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### Reported methods of planting seeds prior and after start of the NURI programme

	ADJUMANI District				OBONGI District			
	Refugee		Host		Refugee		Host	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Methods of planting seeds used before joining NURI								
Line planting	20	16.5%	10	11.2%	11	6.5%	4	12.9%
Broad casting	84	69.4%	59	66.3%	129	76.8%	23	74.2%
Both	17	14.0%	20	22.5%	28	16.7%	4	12.9%
Methods of planting seeds used this year (2021)								
Line planting	121	96.8%	78	85.7%	142	84.0%	30	96.8%
Broad casting	3	2.4%	13	14.3%	24	14.2%	0	0.0%
Both	1	0.8%	0	0.0%	3	1.8%	1	3.2%
Recall of elements from training about planting seeds								
Planting in lines	125	99.2%	86	94.5%	168	98.2%	31	100.0%
Correct spacing	117	92.9%	76	83.5%	165	96.5%	30	96.8%
Recommended Intercropping	103	81.7%	73	80.2%	165	96.5%	31	100.0%
New elements under line planting learnt during the training	119	95.2%	85	93.4%	83	49.4%	17	54.8%
Line planting and correct spacing observed in the field	101	80.2%	58	63.7%	118	68.6%	23	74.2%
Recommended intercropping observed in the field	92	73.0%	66	72.5%	116	67.4%	19	61.3%

### Farmers that practice weeding of fields in conformity to the CSA training

		ADJUMANI District				OBONGI District			
		Refugee		Host		Refugee		Host	
		Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Weeded field this season		126	100.0%	90	100.0%	167	97.7%	30	100.0%
Number of times farmers weeded this season	1	6	4.8%	8	8.9%	18	11.0%	2	6.7%
	2	91	73.4%	67	74.4%	117	71.3%	25	83.3%
	3+	27	21.8%	15	16.7%	29	17.7%	3	10.0%
Method of weeding used									
Hand hoe (Mechanical)		125	99.2%	91	100.0%	163	97.0%	31	100.0%
Chemical		0	0.0%	1	1.1%	1	0.6%	0	0.0%
No. of times farmer was weeding prior to joining NURI	Once	31	26.3%	26	29.2%	69	40.8%	13	44.8%
	Twice	77	65.3%	60	67.4%	80	47.3%	13	44.8%
	Thrice	9	7.6%	3	3.4%	10	5.9%	2	6.9%
	None	1	0.8%	0	0.0%	10	5.9%	1	3.4%
First Weeding was completed		126	100.0%	91	100.0%	163	99.4%	31	100.0%
Period when first weeding was done (in weeks)	1-2	83	65.9%	63	69.2%	103	61.7%	17	54.8%
	3-4	43	34.1%	28	30.8%	62	37.1%	13	41.9%
	5+	0	0.0%	0	0.0%	2	1.2%	1	3.2%
Second weeding was completed		115	96.6%	79	95.2%	147	92.5%	27	96.4%
Period when second weeding was done (in weeks)	1-2	6	5.0%	6	7.1%	20	13.2%	4	13.8%
	3-4	60	49.6%	34	40.5%	81	53.3%	16	55.2%
	5+	55	45.5%	44	52.4%	51	33.6%	9	31.0%
Recall about weeding from the CSA training									
Timely weeding		126	100.0%	86	94.5%	163	95.3%	29	93.5%
Application of alternative measures		69	54.8%	52	57.1%	156	91.2%	28	90.3%
Combination of methods		51	40.5%	35	38.9%	151	88.3%	27	87.1%
New elements learnt about weed control		88	69.8%	62	68.9%	85	50.6%	18	58.1%
Correct weeding observed in the field		105	83.3%	72	79.1%	133	77.3%	23	74.2%

### Pest and Disease Control among beneficiaries of the CSA Training

	ADJUMANI District				OBONGI District			
	Refugee		Host		Refugee		Host	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Registered pests and diseases on the field	70	56.5%	51	56.0%	82	49.7%	16	51.6%
Elements recalls on control of pests and diseases								
Cultural methods like crop rotation, fallowing	86	68.3%	61	67.0%	163	95.9%	27	90.0%
Use of organic methods like tobacco, soap, chilly	103	81.7%	72	79.1%	158	92.9%	27	90.0%
Chemical control as a last resort	100	79.4%	71	78.0%	154	90.6%	27	90.0%
Use of a combination of methods	42	33.6%	25	27.5%	144	84.7%	24	80.0%
New element learned about control of pests and diseases	101	82.1%	65	72.2%	93	54.7%	15	50.0%
Correct pest and disease control observed in the field	54	42.9%	38	41.8%	114	66.3%	18	58.1%

### Soil fertility and water management on Mixed group members' fields

	ADJUMANI District				OBONGI District				
	Refugee		Host		Refugee		Host		
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	
Members' rating of soil fertility currently	Very poor	3	2.4%	1	1.1%	1	0.6%	0	0.0%
	Poor	1	0.8%	1	1.1%	1	0.6%	0	0.0%
	Fair	7	5.6%	0	0.0%	7	4.2%	2	6.5%
	Good	29	23.4%	29	31.9%	118	70.7%	24	77.4%
	Very good	84	67.7%	60	65.9%	40	24.0%	5	16.1%
Farmers that experienced any soil fertility & water management challenges before NURI	45	36.3%	34	37.4%	51	30.0%	3	9.7%	
Elements recalls on soil fertility sessions									
Mulching	116	92.8%	80	87.9%	167	97.7%	29	93.5%	
Use of cover crops	61	48.8%	43	47.3%	166	97.1%	29	93.5%	
Inoculation of legumes with rhizobia	11	8.8%	2	2.2%	155	90.6%	24	77.4%	
Crop rotation	74	59.2%	53	58.2%	166	97.1%	29	93.5%	

Constructing terraces, bands, trenches	104	83.2%	76	83.5%	163	95.3%	29	93.5%
Fallowing of land	55	44.0%	52	57.1%	159	93.0%	29	93.5%
Application of manures	70	56.0%	43	47.3%	159	93.0%	28	90.3%
Application of inorganic fertilizers	47	37.9%	22	24.2%	148	86.5%	29	93.5%
Element under soil fertility and water management that was new	102	81.6%	65	72.2%	91	53.2%	17	54.8%
Soil fertility management observed in the field	93	73.8%	67	73.6%	145	84.3%	21	67.7%

### Quantity harvested, sold and consumed from strategic crops planted in 2020

			Land size (in acre)		Quantity of seeds (Kgs) per acre		Yield per Acre (Kgs/acre)		Percentage (%) of Harvest sold (Kgs)		Percentage (%) of Harvest consumed (Kgs)	
			Number	Mean	Number	Mean	Number	Mean	Number	Mean	Number	Mean
ADJUMANI District	Refugee	MAIZE	70	0.56	70	14.1	66	486.7	43	45.5	74	70.7
		Groundnuts	26	0.56	26	35.8	25	336.1	19	64.0	26	107.3
		CASSAVA	1	0.85	1	3.9						
		BEANS	86	0.48	86	33.6	82	4697.4	50	49.3	83	62.0
	Host	SOYBEAN	1	0.50	1	12.0	1	520.0	1	50.0	1	50.0
		MAIZE	34	0.63	34	10.4	34	302.8	27	50.1	38	69.2
		Groundnuts	14	0.61	14	21.1	14	155.9	10	58.5	15	69.5
		BEANS	46	0.60	45	19.7	45	251.2	37	51.4	44	58.7
OBONGI District	Refugee	SESSAME	22	0.56	22	6.7	19	174.5	15	70.0	9	62.8
		MAIZE	33	0.57	31	46.8	32	939.7	16	58.6	31	74.1
		Groundnuts	95	0.59	92	35.5	89	324.9	57	50.6	74	64.1
	Host	SESSAME	2	0.80	2	2.3	2	120.0	2	75.0	1	50.0
		MAIZE	6	0.76	6	10.0	5	177.6	1	33.3	3	61.1
		Groundnuts	16	0.64	16	25.0	16	183.4	8	57.4	12	61.5

**Mean value (UgShs.) of produce/strategic crops marketed in 2020**

		<b>Strategic Crop</b>	<b>HHs</b>	<b>Mean</b>
ADJUMANI District	Refugee	MAIZE	42	212,400
		GROUNDNUTS	17	215,500
		BEANS	55	189,900
		<b>Total</b>	<b>114</b>	<b>202,000</b>
	Host	MAIZE	33	108,600
		GROUNDNUTS	12	133,400
		BEANS	46	240,800
		<b>Total</b>	<b>91</b>	<b>178,700</b>
OBONGI District	Refugee	SESSAME	14	150,500
		MAIZE	13	85,950
		GROUNDNUTS	52	152,400
		BEANS	2	250,000
		<b>Total</b>	<b>81</b>	<b>143,800</b>
	Host	SESSAME	3	123,300
		GROUNDNUTS	7	368,000
	<b>Total</b>	<b>10</b>	<b>294,600</b>	

**Level of recall of topics on PHH and value addition among mixed groups**

	ADJUMANI District				OBONGI District			
	Refugee		Host		Refugee		Host	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
<b>Major elements recalled about post-harvest handling from the CSA training attended under NURI</b>								
Indicators of crop maturity	99	82.5%	70	81.4%	161	100.0%	31	100.0%
Causes of PHH losses	71	57.3%	40	44.9%	171	100.0%	31	100.0%
Methods of harvesting	93	73.8%	64	71.1%	170	99.4%	30	96.8%
Threshing/shelling	84	66.7%	68	75.6%	168	98.2%	30	96.8%
Proper drying	110	87.3%	82	91.1%	167	97.7%	30	96.8%
Cleaning	110	87.3%	72	80.0%	168	98.2%	31	100.0%
Grading/sorting out pallets	93	73.8%	72	79.1%	164	95.9%	29	93.5%
Storing of produce and methods	100	79.4%	72	80.0%	162	94.7%	29	93.5%
Storage pests and their control	73	57.9%	47	52.2%	157	91.8%	29	93.5%
Clean store or none leaking roof	96	76.2%	66	73.3%	162	94.7%	31	100.0%
New Elements under PHH during the CSA training	71	64.5%	51	59.3%	65	38.7%	10	33.3%
Applied harvest handling measures during and after harvesting	104	82.5%	66	72.5%	125	72.7%	16	51.6%
Carried out value addition to crop before marketing	37	29.4%	41	45.1%	114	66.3%	12	38.7%