

# PROGRESS REPORT

## RIWAH PROJECT

### November 2025

Testing and innovating low-cost, context specific water harvesting technologies for smallholder farmers in Uganda and Tanzania



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**Report developed by:** *Therese Bundgaard (Organic Denmark), Gerald Anthony Kizito (Caritas Kampala), Sigrid Soelberg Vestergaard (Organic Denmark).*

**Cover photo:** *RIWAH group testing water harvesting techniques. Credit: Kule Joakas*



## 1. Introduction

The 3-year RIWAH-project has the development objective to increase resilience to climate change-related water shortages among smallholder farmer families in climate-vulnerable districts. Through the development of and advocacy for context-specific low-cost water harvesting technologies (WHT) it will contribute to sustainable water management sectors in Uganda and Tanzania. This is achieved through two outcomes; 1) Context specific low-cost WHTs innovated by 2000 smallholder farmer families organized in 100 farmer groups in five districts and 2) Low-cost WHTs for smallholder farmers are integrated in local adaptation plans in 5 districts. The main activities are targeting group-led innovation of low-cost WHT, participatory MEL on resilience efficiency, and facilitation of dialogue between smallholder farmers and relevant duty bearers at district government level to influence development of local adaptation plans to include action plans for water access for smallholder farmers with WHT as a specific solution.

The purpose of the progress report is to demonstrate the results from the first two gatherings of data from Farmer Family Learning Groups (FFLG) and individual households. It focuses on their access to water sources, their experiences with the RIWAH project and implementation of WHT's and their challenges with water shortages.

### 1.1 Background

Smallholder farmer families' food and income security are vulnerable to and impacted by climate change because their economic activities rely mainly on crop production and livestock keeping. Once the periods of dry season as well as the extended drought periods caused by climate change set in, crop production is affected causing seasonal food insecurity due to crop failure caused by water scarcity. Simple and affordable WHT can increase water-use efficiency and improve access to water for farming in the dry seasons and periods of draught as well as contribute to quality of drinking water and enhance integrated water management at household-level. Thereby contributing to a solution to the water access challenge for the smallholder farmers, pointing a way forward for good governance in a sustainable water management sector in the two countries. Majority of smallholder farmers in the target districts neither have the technical capacity on WHT nor can they afford to purchase equipment for water harvesting and irrigation system to grow food in the dry season. Access to water is acknowledged as a right at country level, however local adaptation plans



are still in development at district level. The objective of the project is to identify and innovate context specific WHTs, that are affordable for smallholder farmers, and through integration in local adaptation plans contribute to resilience towards water shortages. The project focuses on water access through water harvesting and storage, and the correct solutions of low-cost WHT systems will vary from community to community and district to district. If interested more information about the project purpose, partners, target groups and interventions can be found here <https://organicfflg.org/learning-centre/riwah-project/>

## 1.2 Data

### *Data collection methods*

Data collection in connection with monitoring and evaluation in the project consists of a balance of qualitative and quantitative data collected among target groups and stakeholders related to the program's outcomes. Data collection was conducted on different levels, both FFLG's and individual households.

The monitoring, evaluation and learning (MEL) task-group has developed a participatory MEL system, translated into required languages for quantitative data collection, an interview guide for qualitative data collection, and guidelines for desk top research. To secure reliability and validity in the data collection, the M&E officer from Caritas Kampala has conducted training among ESFROMA partners and master facilitators in the use of MEL system. In the uncertain, dynamic circumstances that characterize social change, the paths to achieve the objective and outcome are to a certain extent unpredictable, and predefined objectives and theories of change can be modified over time to respond to the changes in the context. In this project, applied cocreation is an intended action and the MEL system systematically collects the innovations, intended and unintended outcomes of the interventions among FFLGs, collaboration with CSO and local government agencies.

Despite these considerations, it remains important to acknowledge the potential methodological risks, particularly concerning the credibility of responses and the possibility of social desirability bias. This bias arises when respondents provide answers, they believe the interviewer wants to hear or that aligns with socially acceptable norms. In many cultural contexts, issues related to honor, dignity and status can strongly influence self-reporting. For example, respondents may overstate the number of meals or food varieties consumed to



avoid appearing poor or experiencing the social stigma associated with hunger. Likewise, FFLGs may be inclined to overstate the positive effects of WHTs in hopes of securing continued project investments in the area. It may also be reflected as a form of demand effect, where respondents answer in ways they think align with the expectations of the interviewer. To minimize these risks, the project provides thorough training for interviewers and master facilitators and ensures that data collectors are culturally aligned with the respondents. Additionally, efforts are made to include both women and men in the data-gathering process, since a balance in gender participation can lead to more nuanced and trustworthy insights.

The data collection process has resulted in two datasets: one at the FFLG- and one at household-level. The datasets are collected in five districts - three in Uganda, one in Tanzania, and one in Zanzibar. Table 1.2.1 shows the distribution of survey respondents across districts and survey round.

The household-level dataset consists of 397 households, with 237 from Uganda, 80 from Tanzania, and 80 from Zanzibar. The households represent 99 different FFLGs, with approximately four households represented in each group. The FFLG-dataset from November consists of 101 farmer groups with 20 from each district unless Kagadi who have 24 groups represented.

**Table 1.2.1:** *Overview of Participants in Surveys across Districts for August and November*

	Survey round	Households	Farmer groups
<b>Total</b>	Aug 2025	414	104
	Nov 2025	397	101
<b>Chamwino</b>	Aug 2025	80	20
	Nov 2025	80	20
<b>Unguja Island</b>	Aug 2025	80	20
	Nov 2025	80	20
<b>Kasese</b>	Aug 2025	83	20
	Nov 2025	76	20
<b>Kagadi</b>	Aug 2025	87	24
	Nov 2025	82	21
<b>Wakiso</b>	Aug 2025	84	20
	Nov 2025	79	20

Note: HH- and FFLG dataset August and November 2025



Across all three countries, the respondents from the August and November 2025 survey rounds largely originate from the same FFLGs. However, several differences in group representation should be noted. In Uganda, three FFLGs participated in the November round but not in August. For two of these groups, individual household interviews were collected in August, even though the group-level interviews were not. Similarly, on Unguja Island, one FFLG appears only in the November dataset, but households from this group were surveyed in both rounds. In Chamwino, two FFLGs were not represented in either household- or FFLG-level dataset in August but appear in both datasets in November. Conversely, one FFLG is represented in both datasets in August but not in November.

In summary, three FFLGs participated only in November, one participating only in August, and four FFLGs were represented either through household- or FFLG-level data, but not in both.

Matching individual household respondents across the two survey rounds is challenging due to variations in spelling, inconsistencies in recorded names and small differences in noted locations. Nevertheless, in most FFLGs, a substantial number of the same households appear in both August and November, although some respondents are new and others only appear in August.

These variations do not pose a methodological concern for the purpose of this report. Because the analysis aims to describe developments from August to November rather than establishing causal relationships between water harvesting technologies and food security, all respondents are included, regardless of whether they participated in one or both rounds. Excluding households that do not appear in both datasets would unnecessarily reduce the sample and is not required for the descriptive focus of this report. The methodological considerations and limitations related to causality will be further discussed in the following section.

### *Accountability and Transparency through Reports*

This report aims to strengthen accountability and transparency by providing an overview of the project's progress in terms of performance and emerging impacts, both overall and at district level. The continued collection of monitoring data allows us to track developments over time and supports ongoing evaluations of the implementation process by identifying the



challenges and advantages experienced by the involved target groups. The intention is to provide solid insights that inform program adjustments and foster learning to support implementation as the project evolves.

It is important to emphasize that this report does not attempt to establish a causal relationship between the implementation of water harvesting technologies and improvements in water resilience or food security. Although such causal insights are relevant and central in evaluating the contribution and impact of the RIWAH-project, several methodological constraints limit the validity of causal claims at this stage.

First, the time period between the two survey rounds, August to November 2025, is less than three months. This short interval provides limited opportunity for newly implemented WHTs to generate measurable improvements in water accessibility or food security. These outcomes typically require more long-term observations, as they are influenced by a variety of factors.

Second, although district-specific characteristics remain relatively constant, since the same FFLGs were surveyed in both rounds, the time-varying factors between August and November introduce substantial uncertainty. Observed differences may reflect seasonal variation in rainfall, crop harvesting cycles or temporary water shortages rather than effects directly caused by the implementation of WHTs. This makes it difficult to distinguish project-related changes from normal seasonal dynamics.

Third, to link the results specifically to the RIWAH-project, it would be necessary to include a comparable control group. This would increase the likelihood that the observed developments in food security and water resilience can be attributed to the implementation of WHTs.

Given these constraints, an attempt to estimate a causal effect would have low credibility, as the analysis cannot reliably separate the project-effect from other factors. For this reason, this report deliberately has a descriptive approach, focusing on illustrating observed developments, particularly in the implementation of the introduced WHTs, which is an important early outcome on the way toward the long-term goals of the project. The report also includes subjective perceptions reported by farmers, as these provide valuable insights in the challenges during the early stages of implementation.



Over time, as additional survey rounds are conducted and more longitudinal data become available, it will be possible to apply analytical approaches that more robustly can assess causal relationships. With longer time horizons and more variation in both implementation and outcomes, future analyses can more credibly determine whether, and to what extent, the RIWAH-project contributes to improved water resilience and food security among participating farmers.

### *Household Dietary Diversity Score*

Food security is measured using Household Dietary Diversity Score (HDDS). The score is calculated by summing the amount of different food groups each household has eaten in the last 24 hours. The measure is collected on household-level and includes food prepared and consumed in the home, or food purchased or gathered outside and consumed in the home. In the survey the following formulation have been used towards the households: *“I will now ask you a question on the food you have been eating in your family the last following 24 hours. It should only be the food eaten at home (not at school, work or lunch in the field). As a general rule, foods consumed outside the home /were not prepared in the home should not be included (HDDS).”* The period of 24 hours is chosen by FAO (Food and Agricultural Organization) because it is less subject to recall errors, less cumbersome for the respondent and conforms to the time period used in many similar studies<sup>1</sup>. This survey includes eleven different food varieties: cereals, root and tubers, vegetables, fruits, meat (including poultry and offal), eggs, fish and seafood, pulses and legumes, milk, oil and fats and sugar and honey. The HDDS therefore ranges from 0 to 11. It is important to notice that in the ESFROMA-program the HDDS range from 1-9 and therefore cannot be compared directly.

There are several limits to the measure, which it is important to consider when interpreting the results. First, the dietary diversity score does not indicate the quantity of food consumed and doesn't account for differences in diet across seasons. Some food may be available in large quantities and at low cost for short periods. Second, there may be urban and rural differentials in dietary diversity. Variety is often much greater in urban and peri-urban centers where food markets are adequately supplied and easily accessible.

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<sup>1</sup> Household Dietary Diversity | Nutrition | Food and Agriculture Organization of the United Nations



Third, the measure does not include food consumed outside the household, such as lunches in the fields or meals at work or school. As this limitation applies equally to both August and November, it remains meaningful to interpret changes over time. Nevertheless, it is important to consider how the score is interpreted. There are no official cut-off values that define adequate or inadequate dietary diversity. When analyzing HDDS, it is necessary to pay attention to possible ceiling effects, where higher scores may no longer reflect meaningful improvements. For example, an increase from 9 to 10 is not necessarily as substantial as an increase from 4 to 5. This will be easier to assess once data over a longer period of time are available.

A more detailed discussion on use of the mean dietary diversity score can be found in the FANTA publication: Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access: Indicator Guide, VERSION 2, 2006, (<http://www.fantaproject.org/focus/household.shtml>).



## 2. Key Findings Across the Participating Districts

The following section will present the general results across all districts on the implementation of WHTs, food security and the most common challenges.

*The report covers and discusses a wide range of factors. To simplify the relationships between these factors, the figure below provides an overview of the key variables examined and their estimated connections.*

This report covers and discusses a wide range of factors. To simplify these factors, the figure below provides an overview of the key variables examined and their estimated connections.

**Figure 2.1:** Overview over Variables

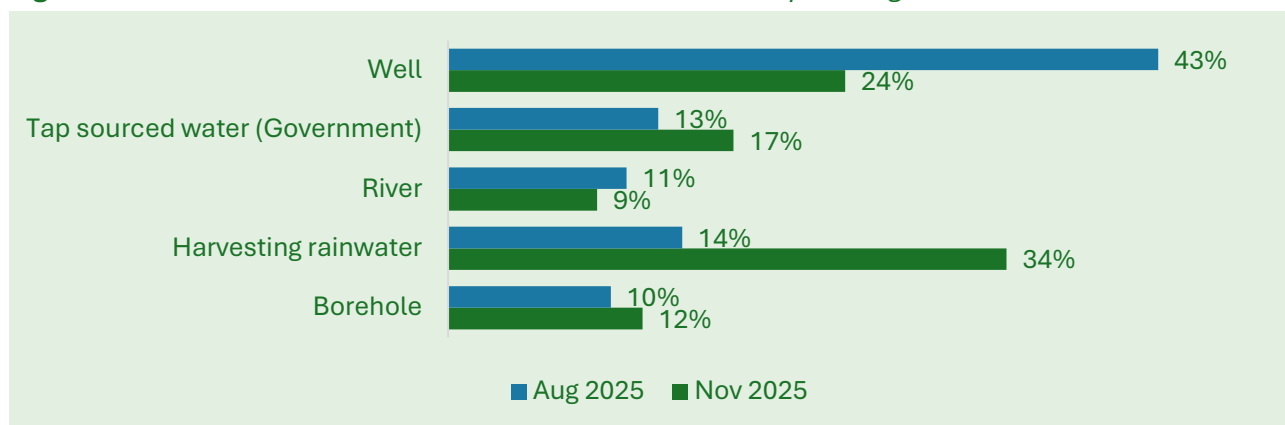


### 2.1 Water Access and Progress in Testing and Implementing WHT

Between August 2025 and November 2025, the main water sources reported by households have changed noticeably. In August, 43% of households reported using a well as their primary source, but this declined to 24% in November. Instead, rainwater harvesting became far more common, and increased from 14% to 34%, making it the most frequently reported main water source in November. Moreover, households relying on government tap water increased by 4 percentage points to 17% of households in November. This development is also visible in the share of households reporting that they harvest and store water. In November this applied to 99%, up from 92% in August. Likewise, 94% reported having implemented at least one WHT since 2025, representing an increase of 5 percentage points since August.



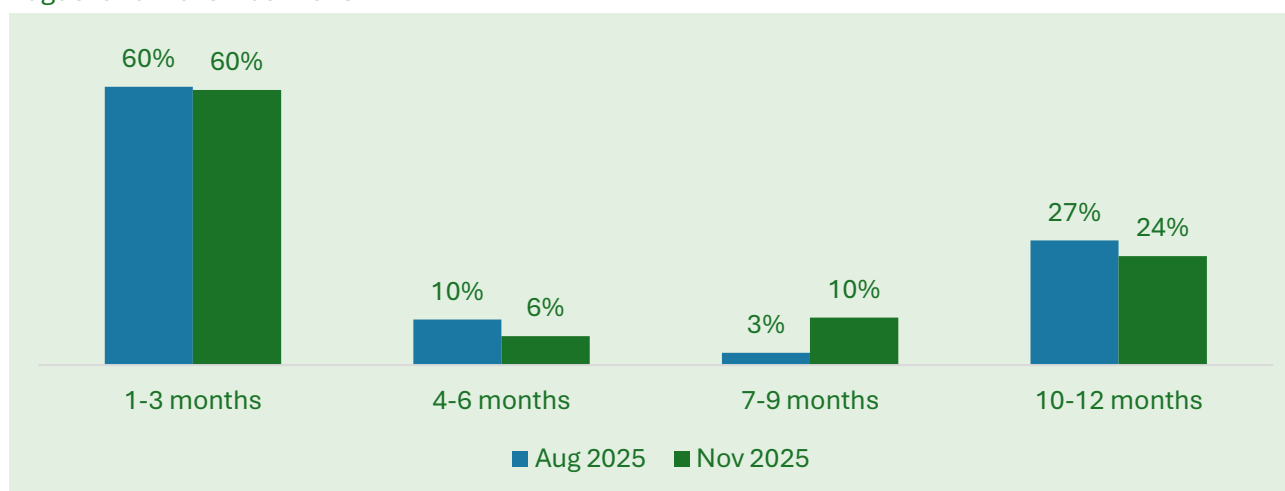
**Figure 2.1.1: Main Current Water Source for Livestock and Crops in August and November 2025**



Note: HH-dataset August and November 2025. N (Aug = 414 and Nov = 397). Q3. What is the main current water source for livestock and crops?

On the negative side, 60% of households still report that their current water sources only supply them with water 1-3 months per year, which is similar to August 2025. The share of households reporting access to water for 10-12 months has decreased slightly from 27% to 24%.

**Figure 2.1.2: Number of Months the Households are Provided with Water from Their Water Sources in August and November 2025**



Note: HH-dataset August and November 2025. N (Aug = 414 and Nov = 397). Q5 For how many months per year are these sources providing you with water for livestock and crops?



Despite the improvements in water harvesting, water shortages remain a significant challenge. It is however important to note that the water harvesting technologies were implemented during 2025, meaning that they would not yet have time to provide water for a longer period.

### *Implementation of WHT*

Looking into the implementation of the WHTs, we observe overall positive progress across all districts. The average number of WHTs per household increased from 1.7 in August to 2.7 in November 2025, which is equivalent to one additional technology implemented per household on average. The share of households who have not implemented any WHTs fell from 11% in August to just 6% in November. In addition, more than half of all households have now implemented three or more WHTs, compared to only 22% in August.

**Table 2.1.1: Average Number of Implemented WHTs per Households Across Districts**

	Aug 2025	Nov 2025
<b>Total</b>	<b>1.7</b>	<b>2.7</b>
<b>Chamwino</b>	1.2	3.8
<b>Kagadi</b>	1.2	2.3
<b>Kasese</b>	1.2	2.0
<b>Unguja Island</b>	2.5	2.8
<b>Wakiso</b>	2.3	2.6

Note: HH-dataset August and November 2025. N (Aug = 414 and Nov = 397).

At the FFLG-level, no groups reported that no households adopted any of the tested WHTs. It is a substantial improvement since August, when 21% of FFLGs stated that none of their members had implemented any technology

**Table 2.1.2: Share of Households that have Adopted the Tested WHT in the FFLG/Community**

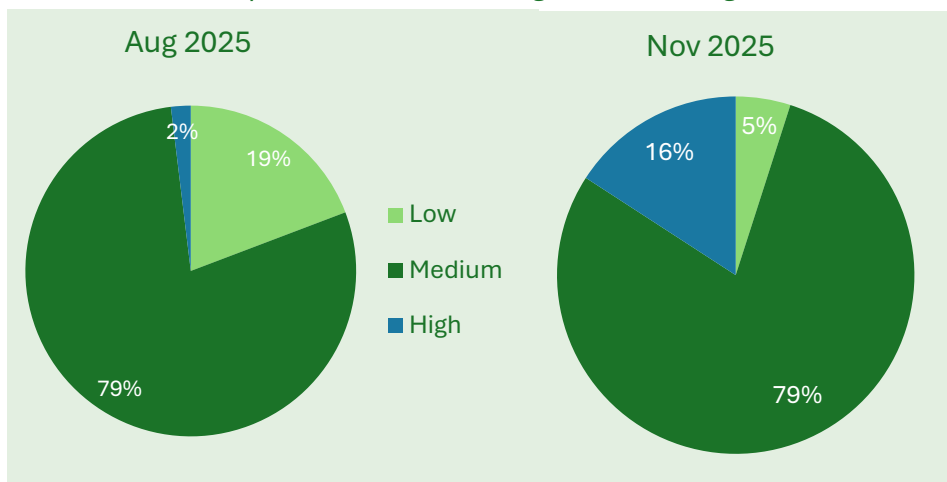
	FFLG		Community	
	Aug 2025	Nov 2025	Aug 2025	Nov 2025
<b>0 HH</b>	21%	0%	25%	4%
<b>1-5 HH</b>	26%	24%	25%	25%
<b>6-10 HH</b>	32%	30%	17%	28%
<b>Above 10 HHs</b>	21%	47%	33%	44%

Note: FFLG-dataset August and November 2025. N (Aug = 104 and Nov = 101). Q4/Q5 How many Households have adopted the tested WHT in the FFLG/community?



The increased implementation rate is also reflected in the FFLGs' self-assessment of their capacity to establish and innovate WHTs. As illustrated in Figure 2.1.2, the share of FFLGs assessing their capacity as high increased by 14 percentage points, while only 5% rated their capacity as low in November.

**Figure 2.1.2:** Self-assessment of Capacities on Establishing and Innovating WHTs in FFLGs

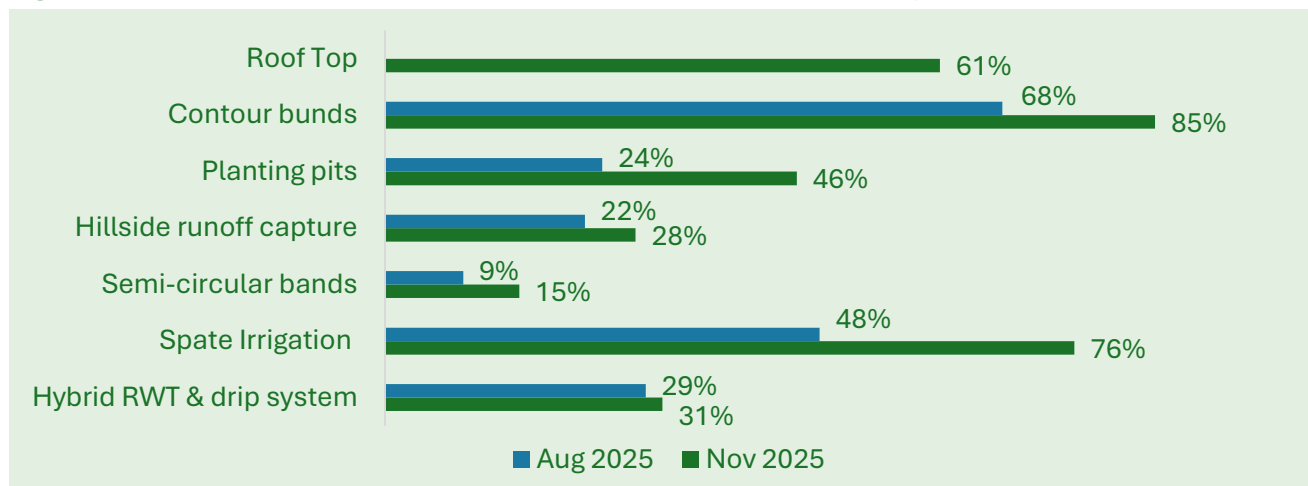


Note: FFLG-dataset August and November 2025. N (Aug = 104 and Nov = 101). Q8 How would you assess your capacity (in your FFLG) on establishing and innovation of WHTs?

Overall, the most widely adopted water harvesting technologies across all districts are contour bounds, mulching and spate irrigation. Figure 2.1.3 presents the share of FFLGs that have tested or implemented each technology, while Figure 2.1.4 shows the share on household level who have implemented to WHT.



**Figure 2.1.3:** Share of FFLGs Who Tested or Established the WHTs for August and November 2025



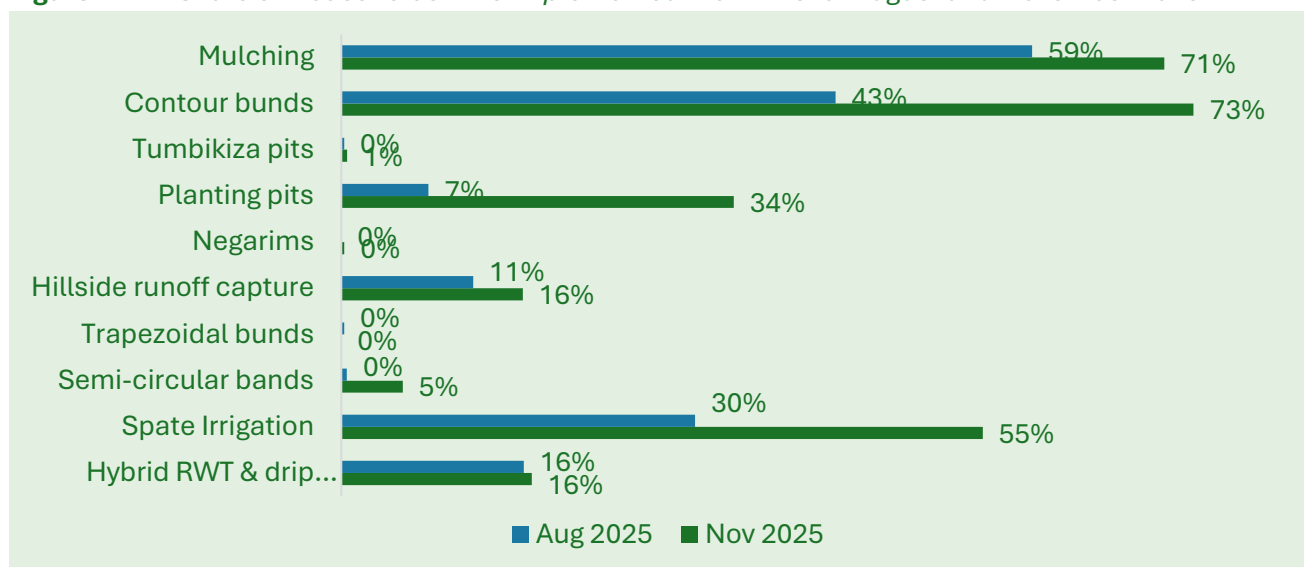
Note: FFLG-dataset August and November 2025. N (Aug = 104 and Nov = 101). Q1. Since January 2025 which water harvesting technologies have you established or tested in your FFLG?

In addition to the three most common technologies, the use of planting pits has also increased noticeably between August and November 2025. ‘Rooftop’ harvesting was not included in the August survey, so its development over time cannot be assessed. However, it is clearly very popular among the farmer groups in November.

It is worth noticing that both contour bound and mulching are also a part of the organic farming practices implemented in the ESFROMA program and this effects the share of implementation. However, we still see an increase in the implementation of both technologies. In addition, also spate irrigation increased notably.



**Figure 2.1.4:** Share of Households Who Implemented the WHTs for August and November 2025



Note: HH-dataset August and November 2025. N (Aug = 414 and Nov = 397). Q13 Since 2025 have you implemented any WHTs in your HH? Q13.1. If yes, mention the on-farm water management systems/practices.

Technologies that were not adopted by any households or FFLGs have been excluded from the figures. These include Tumbukiza Pits, Negarims, and Trapezoidal Bunds. It is worth considering whether these technologies require additional training and information, whether they are unsuitable for the local conditions in the districts, or if other barriers can explain the lack of implementation.

### Sources of information

Regarding the sources of information received by the FFLGs, the trend is generally positive. In November, 91% of FFLGs reported having received workshops or training, compared to 87% in August. Furthermore, 98% of FFLGs experienced rotational visits, which is an increase from just 65% in August. Information received from the government also increased from 5% in August to 19% in November. Although this still leaves considerable room for local authorities to strengthen their role, it nonetheless represents a positive progress. When looking into each district this progress is mainly carried by the districts of Kagadi and Unguja Island. By contrast, the use of online resources remains very low, 2% in November, suggesting that digital channels for information may not be an effective priority of resources within information sources.



**Table 2.1.3: Share of FFLGs Who Have Received Information from Different Sources**

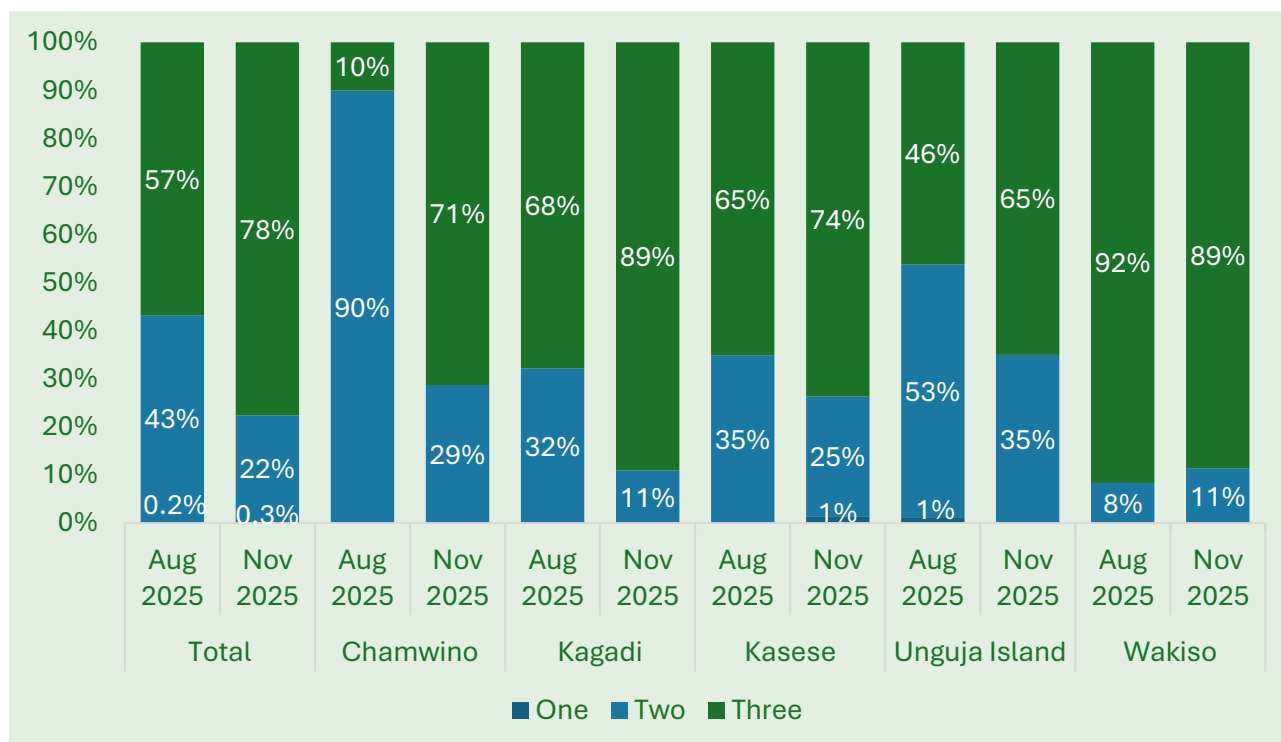
	Aug 2025	Nov 2025
Workshops/Trainings	87%	91%
FFLG rotational visits	65%	98%
Online resources	0%	2%
Government	5%	19%

Note: FFLG-dataset August and November 2025. N (Aug = 104 and Nov = 101). Q3 Since January 2025, what sources of information have you used to learn about water harvesting technologies?

## 2.2 Food security

Overall, there has been a positive development in the number of meals consumed in each household per day. In August, 57% of households reported eating three meals per day, which increased to 78% in November. Figure 2.2.1 illustrates the development across the districts.

**Figure 2.2.1: Number of Meals Per Day Per Households Across Districts for August and November 2025**

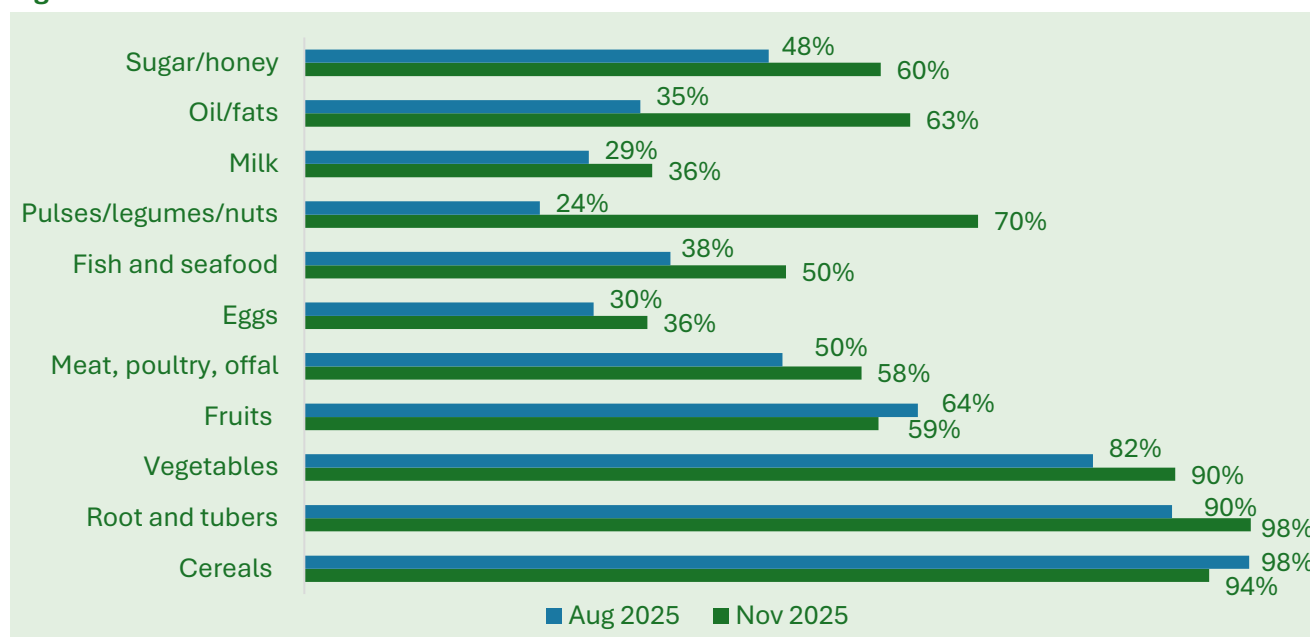


Note: HH-dataset August and November 2025. N (Aug = 414 and Nov = 397). Q14 Looking into the last week, how many meals did your family eat per day?



The most common food varieties are root and tubers, cereals and vegetables, which are consumed by 90% or more of the households. This is similar to August 2025. Furthermore, there have been an increase in the consumption of pulses, legumes and nuts from 24% to 70%. However, it is important to interpret this increase with caution. The time between the two survey rounds is only 2-3 months, which makes it difficult to directly connect the improvement to the implementation of WHTs. Seasonal and climatic variations from August to November may also influence food availability and meal frequency.

**Figure 2.2.2:** Food Varieties Consumed in Households in the Previous 24 Hours of the Interview



Note: HH-dataset August and November 2025. N (Aug = 414 and Nov = 397). Q16. What food varieties compose your meal/prepared and consumed according to this list?

To further assess household food security, we use the Household Dietary Diversity Score (HDDS) (see Data section). Table 2.2.1 presents the average, minimum and maximum scores overall and for each district for both August and November 2025. It is encouraging to observe that the overall average increased by more than one point, reaching 7.1 out of 11 in November. However, similar to the increase in meals per day, this improvement cannot be directly connected to the implementation of WHTs. Especially seasonal changes in food availability, such as which food groups are in season are likely to have influence on the results.



Table 2.2.1 also reveals substantial variations between districts. Chamwino achieves the lowest dietary diversity with an average HDDS of 4.3 and maximum score of 6 in November. At the other end of the scale, households on Unguja Island report the highest dietary diversity with an average HDDS of 9.4 and a minimum score of 6. However, in addition to seasonal factors, differences between districts may also reflect cultural eating habits, access to markets and differences in structural food systems across districts.

**Table 2.2.1: Average, Minimum and Maximum HDDS Across Districts for August and November 2025**

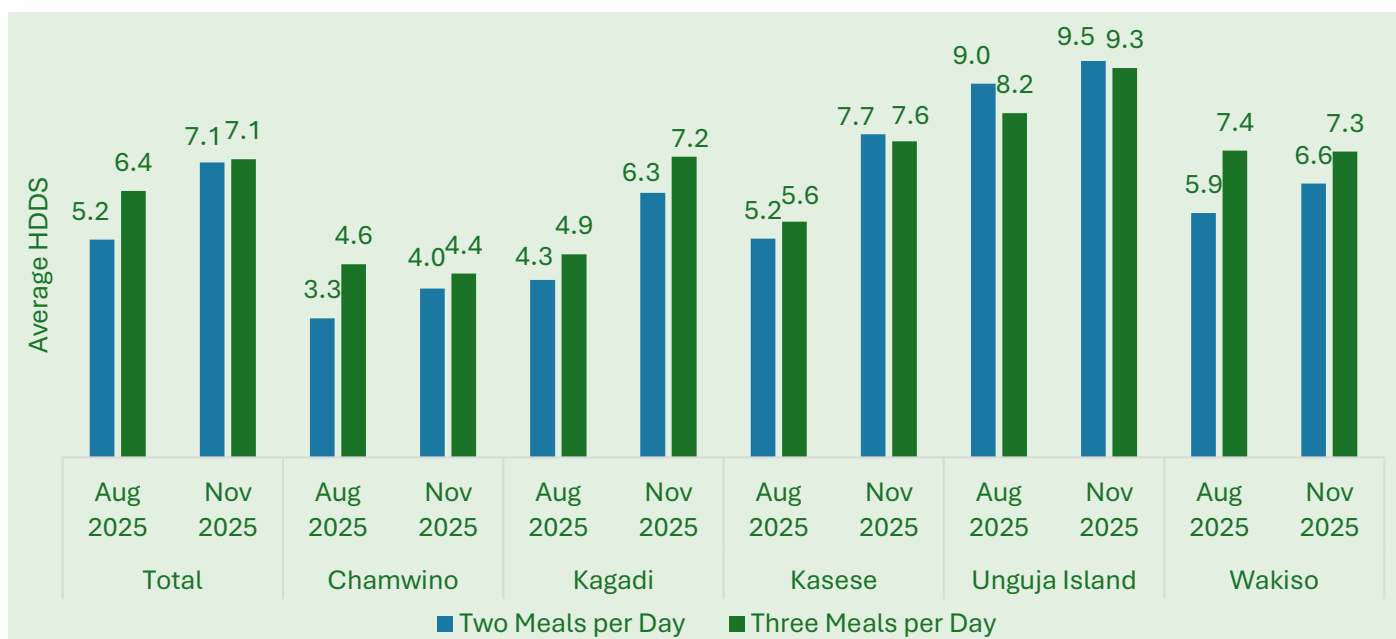
	Average		Min		Max	
	Aug 2025	Nov 2025	Aug 2025	Nov 2025	Aug 2025	Nov 2025
<b>Across all districts</b>	5.9	7.1	2	2	11	11
<b>Chamwino</b>	3.5	4.3	2	3	5	6
<b>Kagadi</b>	4.7	7.1	2	3	9	11
<b>Kasese</b>	5.5	7.6	2	2	10	11
<b>Unguja Island</b>	8.5	9.4	2	6	11	11
<b>Wakiso</b>	7.2	7.2	3	3	11	11

Note: HH-dataset August and November 2025. N (Aug = 414 and Nov = 397). Sum of Q16. *What food varieties compose your meal/prepared and consumed according to this list?*

It is also relevant to examine the relationship between meal frequency and dietary diversity in order to assess how the two food security indicators align. Figure 2.2.3 illustrates the average HDDS by number of meals consumed per day in August and November 2025 across districts. Overall, the figure shows that in November 2025, the average HDDS does not vary substantially by meal frequency. Small variations can be observed at district level where households in Wakiso and Kagadi eating three meals per day also achieve a higher HDDS. The figure may also indicate the presence of a possible ceiling effect, where differences in HDDS associated with the number of meals per day are more pronounced at lower score levels. At higher HDDS levels, additional increases may reflect smaller or less meaningful improvements. This pattern will be important to examine further as more data is gathered over time. Overall, using both meal frequency and HDDS as measures of food security provides a more nuanced understanding of household food consumption patterns.



**Figure 2.2.3: Average HDDS for Number of Meals Per Day Across Districts for August and November 2025**



Note: HH-dataset August and November 2025. N (Aug = 414 and Nov = 397). Q14 Looking into the last week, how many meals did your family eat per day? and sum of Q16. What food varieties compose your meal/prepared and consumed according to this list?

Despite several methodological limitations in examining the relation between implementation of WHTs and HDDS, Table 2.2.2 shows whether there is an observable pattern between the number of WHTs implemented at household-level and dietary diversity.

**Table 2.2.2: Average HDDS for Number of WHTs Implemented in the Households for August and November 2025**

WHTs implemented in HH	Average HDDS		
	August 2025	November 2025	Difference
0	5.3	7.2	1.9
1	4.2	7.5	3.3
2	6.5	7.6	1.1
3	8.3	6.9	-1.4
4	7.9	6.3	-1.6
5	4.5	8.1	3.6

Note: HH-dataset August and November 2025. N (Aug = 414 and Nov = 397). Sum of Q13.1. If yes, mention the on-farm water management systems/practices and sum of Q16. What food varieties compose your meal/prepared and consumed according to this list?



Overall, Table 2.2.2 does not show a clear relationship between the number of implemented WHTs and higher food diversity scores in the households. This does not imply that WHTs have no effect on food security. Instead, it highlights that the relationship is more likely indirect and works through several intermediate steps. First, WHTs are expected to increase water availability for households. Then improved water access needs to contribute to increased crop and livestock production, which in the end should improve the household dietary diversity. These steps require time to materialize and can be influenced by several external factors along the way. Furthermore, more implemented WHTs are not necessarily equal to more use of WHT. A household could also become water resilient with the implementation of only one effective technology. This is important to keep in mind when interpreting increases and decreases in the total number of technologies within the specific districts. In sum, time and more knowledge about the outcomes of the WHTs is necessary to conclude causal relation.

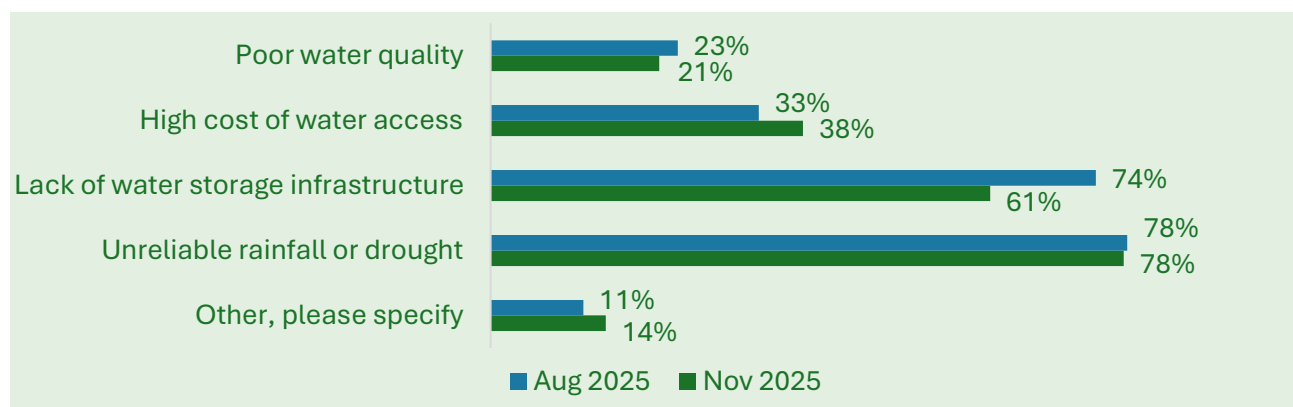
To further achieve knowledge and progress toward the main goals of the RIWAH project, it is therefore essential to consider not only outcome indicators such as HDDS, but also the challenges households and FFLGs face in becoming water resilient and in establishing and maintaining WHTs. These aspects are examined in the following section.

## **2.3 Challenges**

Across all five districts, several recurring challenges continue to affect the households and farmer groups in implementing WHTs and becoming resilient to water shortage. At household level, 78% still report unreliable rainfall or drought in November, which is unchanged from August. In addition, 38% identify high costs of water access as a barrier. Lack of water storage infrastructure remains a widespread challenge as well. Although it has decreased from 74% in August to 61% in November, it is still a concern for the majority of households. The district-specific challenges will be unfolded in the following sections, when looking into each district.



**Figure 2.3.1: Households Challenges in Accessing Water for Livestock and Crops for August and November 2025**



Note: HH-dataset August and November 2025. N (Aug = 414 and Nov = 397). Q12. What challenges do you face in accessing water for your livestock and crops?

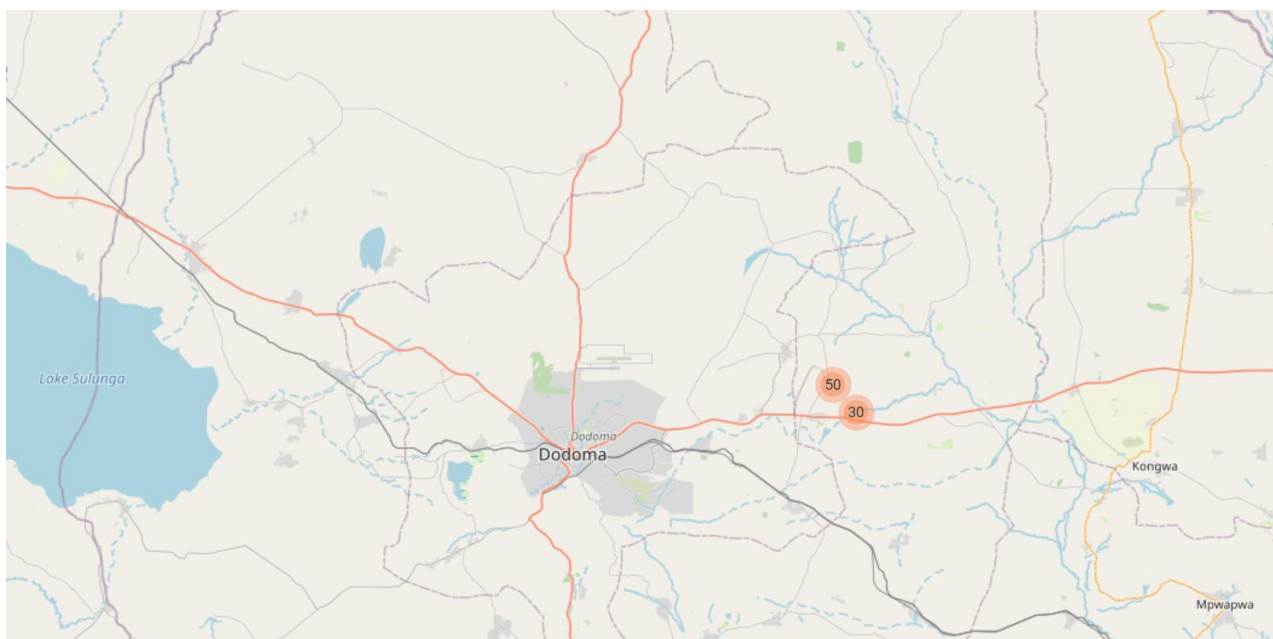
The findings so far across all five districts lead to several taking points. It is encouraging to see an increase in households reporting water harvesting as their main water source and the general positive development in implementation of WHTs among both households and farmer groups. In addition, more farmer groups received rotational visits and information from their local government, and both the average number of meals per day and average HDDS increased as well. On the other hand, there remains a challenge in making the water sources provide water for longer periods of time. Especially, challenges with unreliable rainfall and drought are widespread among households. Even though implementing WHTs can be a step on the way to solve this challenge, rainfall is still necessary for the technologies to work.

In the following sections, we will explore the specific challenges, adjustments and advantages unique to each district.



### 3. Chamwino, Tanzania

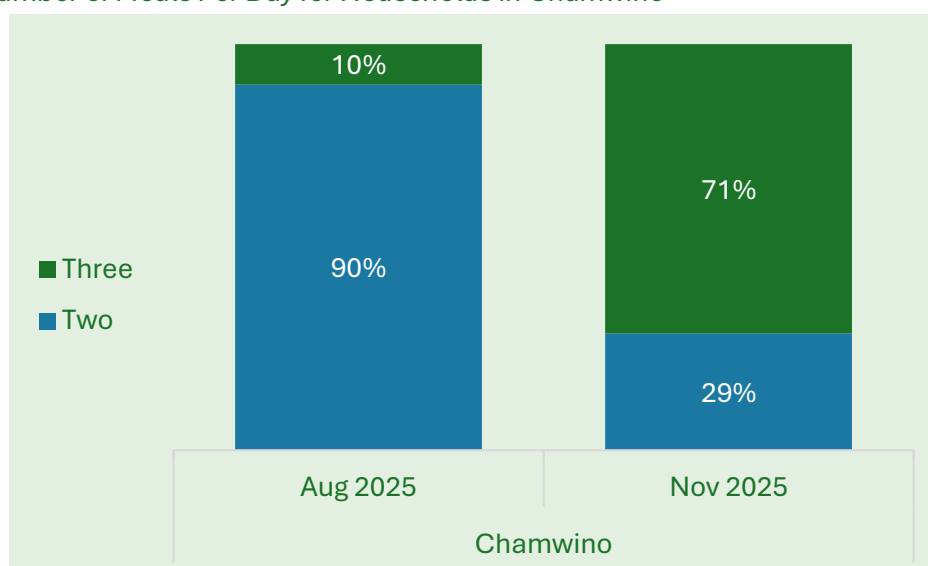
In Chamwino 90% of the population are smallholder farmers and pastoralist keeping their animals locally. The significant number of these smallholder farmers in the district depend on ran fed farming system with an average annual rain of only 610 mm/year. With no use of modern and mechanized farming technologies and machineries farmers are relying on local methods of farming which account for subsistence production just for family consumption. People living in Chamwino district are involving in production of both commercial crops like sunflower, groundnuts, grapes, sesame, cashew nuts and food crops including Sorghum, Maize, Millet, bambala nuts, peas, cassava, diversified vegetables. Prolonged drought that affects the productivity combined with unpredicted and uncertain of rain pattern that sometimes causes abnormal flooding and destabilization of agricultural activities and production as well as environment degradation affects the yields. The target groups are vulnerable to and affected by the effects of climate change because their life and economic activities relies on farming activities both crop production and livestock keeping. Due the climate changes the communities have experienced soil erosion that reduces soil fertility and production capacity of the soil. Food insecurity resulted from the low yielding as well as poor quality crops produced. Lack of diversified food for nutrition purposes due to lack of water for producing some non-seasonal crops.





The November 2025 data from Chamwino, Tanzania covers 20 FFLGs and 80 households across five sub-counties. Most households are small with 86% consisting of 1-3 members and the remaining 14% having 4-6 members. All households report both keeping livestock and growing crops. The most common crops include legumes, cereals and vegetables, while cattle, chickens, ducks and goats are the most frequently kept livestock. Responsibilities for irrigation of crops and watering livestock are mainly shared between men and women, and 75% of households report that children also participate. A similar pattern is observed in the maintenance of existing water harvesting technologies, which likewise is shared among all household members.

**Figure 3.1:** Number of Meals Per Day for Households in Chamwino



Note: HH-dataset August and November 2025, Chamwino. N (Aug = 80 and Nov = 80). Q14 Looking into the last week, how many meals did your family eat per day?

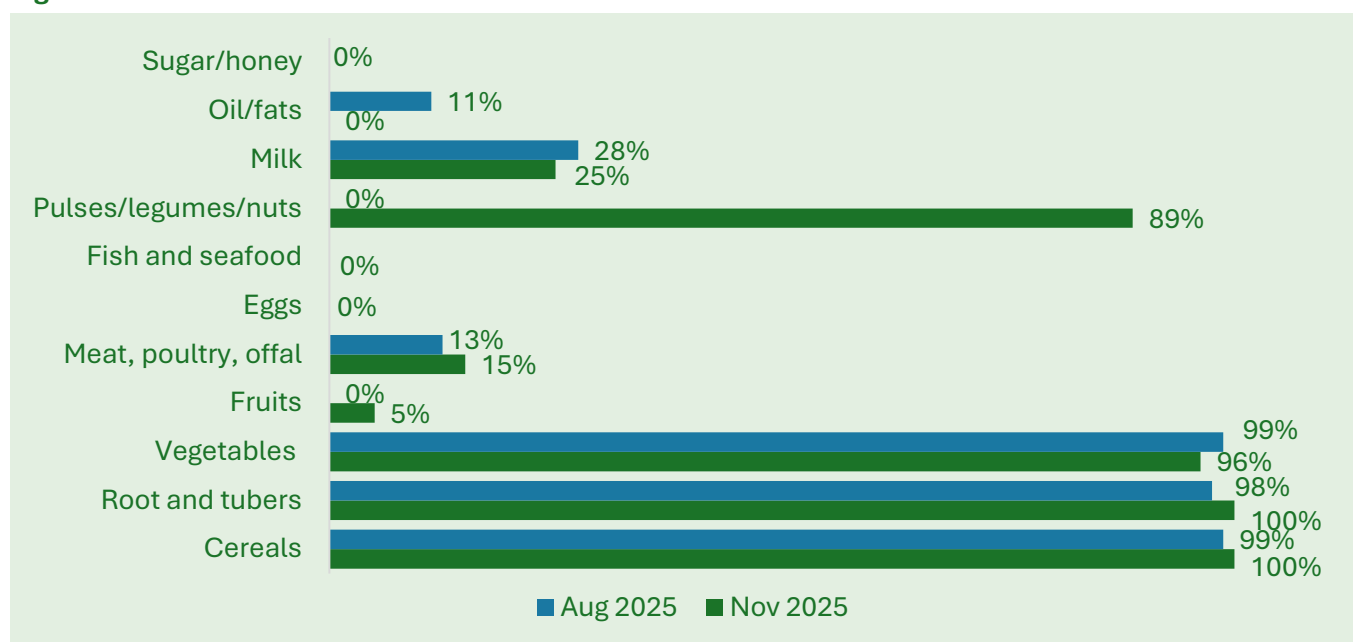
The number of meals per day in households has improved positively since August. In November, 71% of households reported eating three meals per day, compared with only 10% in August. However, 29% still report consuming only two meals per day, placing Chamwino at the lower end compared with districts in Uganda and Unguja Island.

Concerning dietary diversity, nearly all households consumed cereals, roots and tubers and vegetables within the past 24 hours of being surveyed. A notable improvement is the rise in consumption of pulses, legumes and nuts, from 0% in August to 89% in November. The



average HDDS increased from 3.5 in August to 4.3 in November, although Chamwino continues to have the lowest average HDDS among the five participating districts.

**Figure 3.2:** Food Varieties for Households in Chamwino in the Previous 24 Hours of the Interview

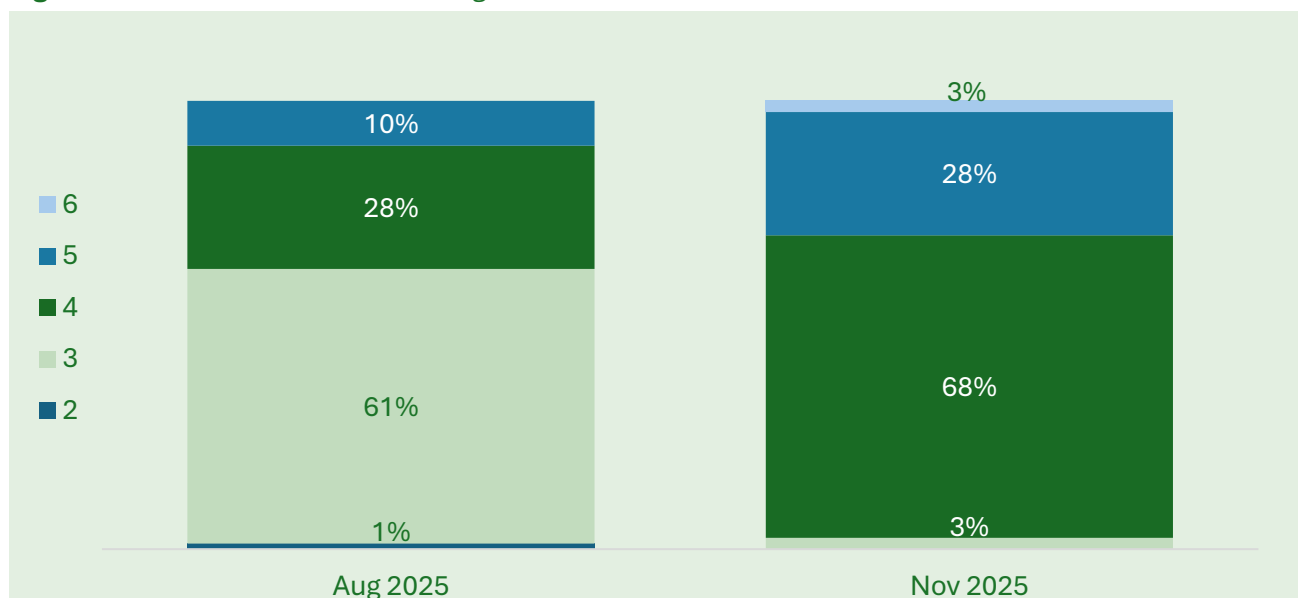


Note: HH-dataset August and November 2025, Chamwino. N (Aug = 80 and Nov = 80). Q16. What food varieties compose your meal/prepared and consumed according to this list?

Figure 3.3 illustrates changes in the distribution of HDDS. In August, 61% of households had an HDDS of 3, however, in November this only accounted for 3%. Instead, 91% achieved a score of 4 or higher, compared with 38% in August. This improvement is especially noteworthy given that 74% of households identify October-December as the period during the year, in which they experience food shortage.



**Figure 3.3** Distribution of HDDS in August and November 2025 for households in Chamwino



Note: HH-dataset August and November 2025, Chamwino. N (Aug = 80 and Nov = 80). Sum of Q16. *What food varieties compose your meal/prepared and consumed according to this list?*

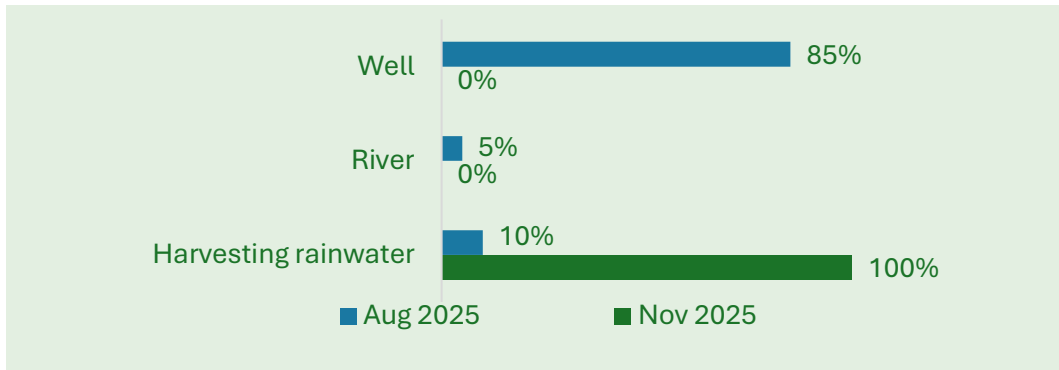
In conclusion, although households in Chamwino still have relatively low HDDS levels and the increase in average score is modest, the development is nonetheless positive. It will be particularly interesting to follow these trends as the rainy season begins.

### 3.1 Water Access and Progress in Testing and Implementing WHT

The main water source in Chamwino in November 2025 is harvesting rainwater, which has increased from 10% in August 2025 to 100% in November. In contrast, 85% of households identified a well as their main water source in August. This aligns with the fact that all households report harvesting and storing water and have implemented at least one WHT's since 2025. However, 95% of households report that they are provided with water for only 1-3 months throughout the year, while 5% is provided for 4-6 months. This limited availability may be explained by the lack of rainfall in Chamwino during this period, meaning that recently established WHTs have not yet been able to supply households with water.



**Figure 3.1.1: Main Water Source for Households in Chamwino**

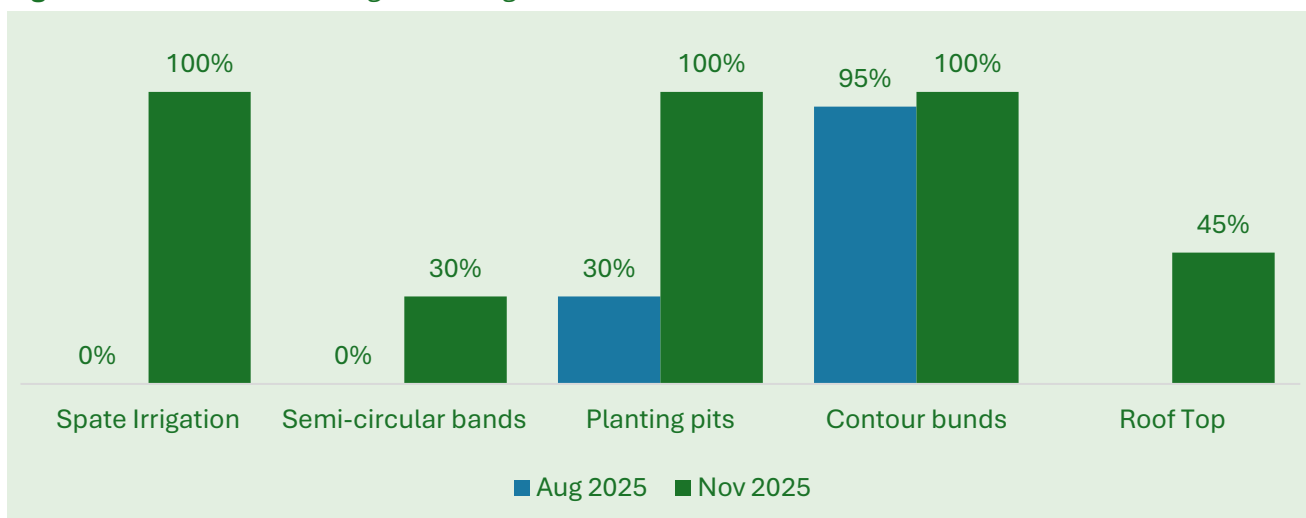


Note: HH-dataset August and November 2025, Chamwino.

N (Aug = 80 and Nov = 80). Q3. What is the main current water source for livestock and crops?

The average number of implemented WHTs per household has increased substantially from 1.2 in August to 3.8 in November. This means that each household on average has implemented two additional WHTs in the period from August to November. In August, mulching was the only widely implemented technology, largely because it is also integrated in the ESFROMA program. In August, FFLGs reported no households had implemented any WHTs at that time, and only contour bunds and planting pits had been tested within the groups. By November, however, multiple technologies had been tested with a particular rise in the adoption of spate irrigation.

**Figure 3.1.2 Water Harvesting Technologies Tested or Established in the FFLGs in Chamwino**

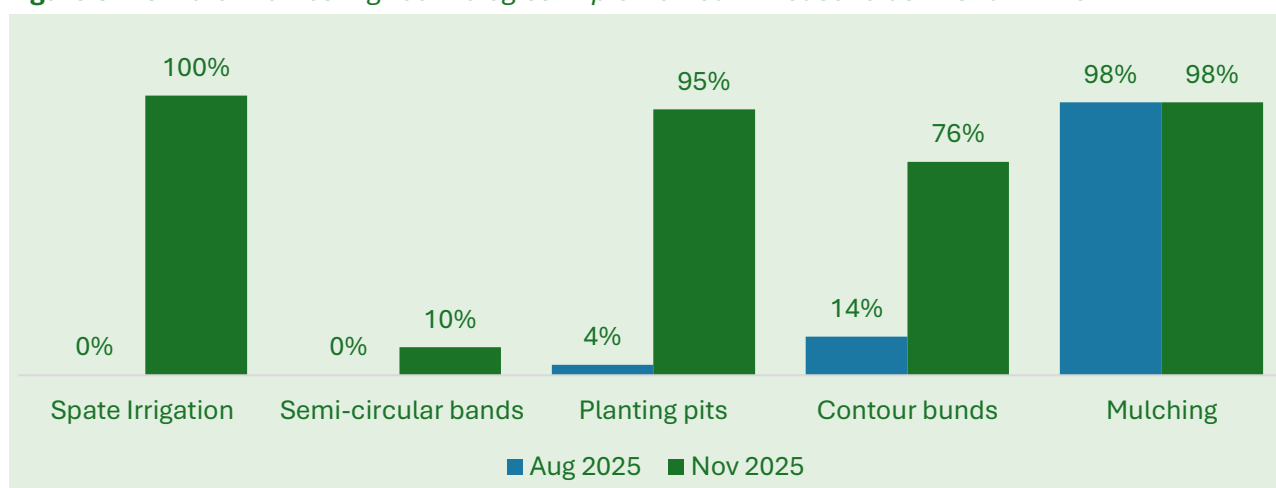


Note: FFLG-dataset August and November 2025, Chamwino. N (Aug = 20 and Nov = 20). Q1 Since January 2025 which water harvesting technologies have you established or tested in your FFLG?



The development in tested and established WHTs in the FFLGs influences the implementation of WHTs in the households. In November, 95% of FFLGs report that more than six households in their group have adopted the tested technologies. At household level the most implemented technologies are spate irrigation, mulching, contour bunds and planting pits. This demonstrates that the WHTs tested at FFLG level is also reflected in which practices are adopted by individual households.

**Figure 3.1.3** *Water Harvesting Technologies Implemented in Households in Chamwino*



Note: HH-dataset August and November 2025, Chamwino. N (Aug = 80 and Nov = 80). Q13 Since 2025 have you implemented any WHTs in your HH? Q13.1. If yes, mention the on-farm water management systems/practices.

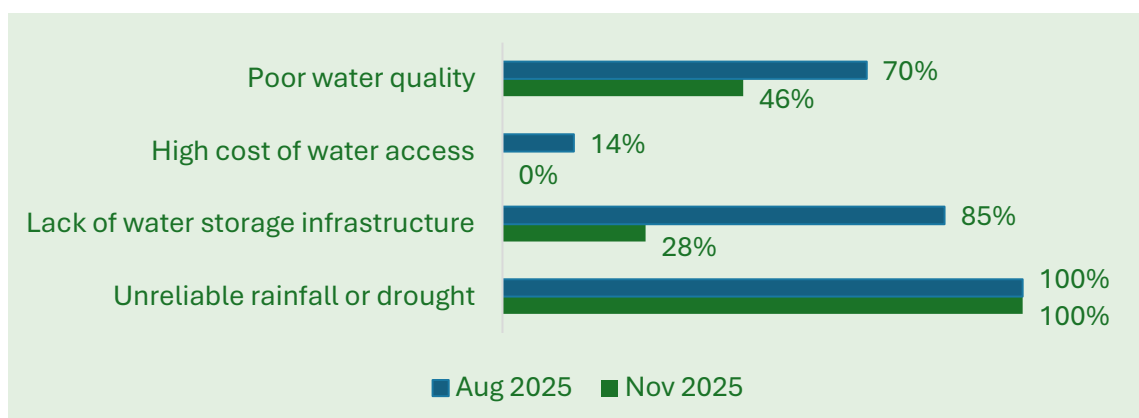
In August 2025 all FFLGs learned about WHTs through workshops and training. Encouragingly, by November all groups had also been on rotational FFLG visits, compared with only 15% in August. All 20 FFLGs additionally report that the groups have conducted training sessions on water harvesting technologies as a part of their adjustments in the program since August. These training activities likely contributed to the increase in implemented WHTs. However, no FFLG report receiving information from their government, indicating a need for stronger engagement from local authorities. In addition, all 20 FFLGs assess their capacity to establish and innovate WHTs as medium in November. Even though this is an improvement from 95% in August, it still indicates room for further training, support and knowledge to strengthen their capacity to 'high'.



### 3.2 Challenges and Advantages for FFLGS and Households

The most significant challenge reported in both August and November 2025 by households in Chamwino is unreliable rainfall and drought, as a major obstacle in accessing water for livestock and crops. On a positive note, the share of households reporting lack of water storage infrastructure as a challenge decreased from 85% in August to 28% in November. During this period reports on poor water quality fell from 70% to 46%. The FFLGs also highlight drought and unpredictable rainfall as the most current challenges of establishing and using the WHTs. This aligns with the current situation in Chamwino, where households are still waiting for rainfall to benefit from the implemented water harvesting technologies.

**Figure 3.2.1:** Households Challenges in Accessing Water for Livestock and Crops for August and November 2025 in Chamwino

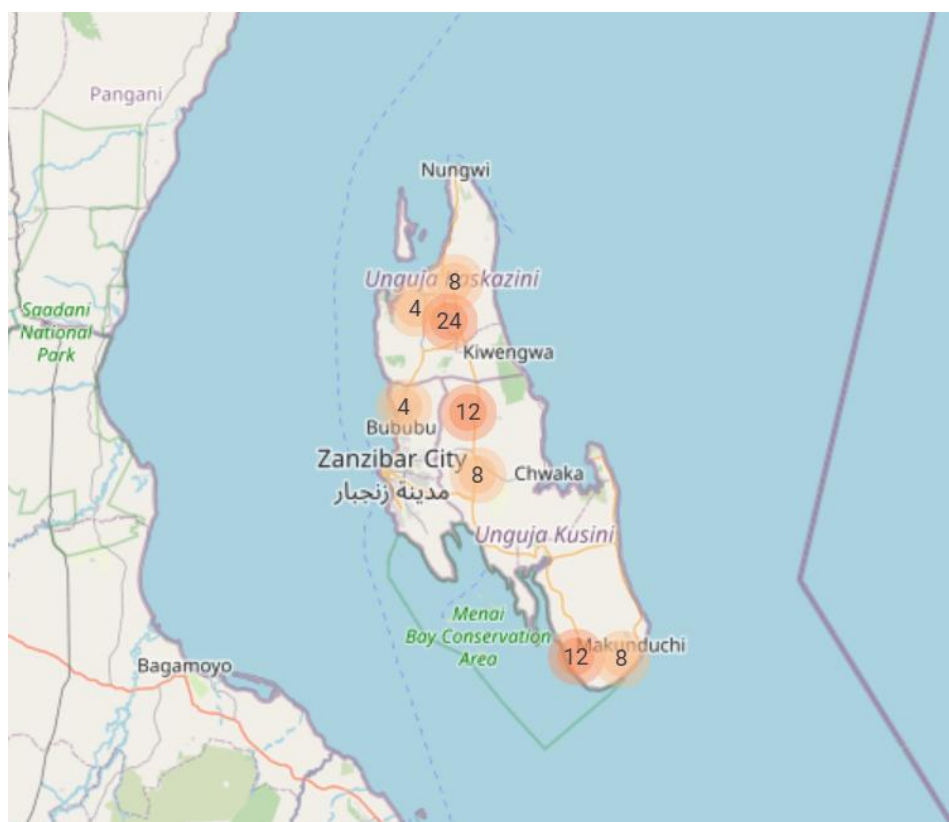


Note: HH-dataset August and November 2025, Chamwino. N (Aug = 80 and Nov = 80). Q12. What challenges do you face in accessing water for your livestock and crops?



## 4. Unguja Island, Zanzibar

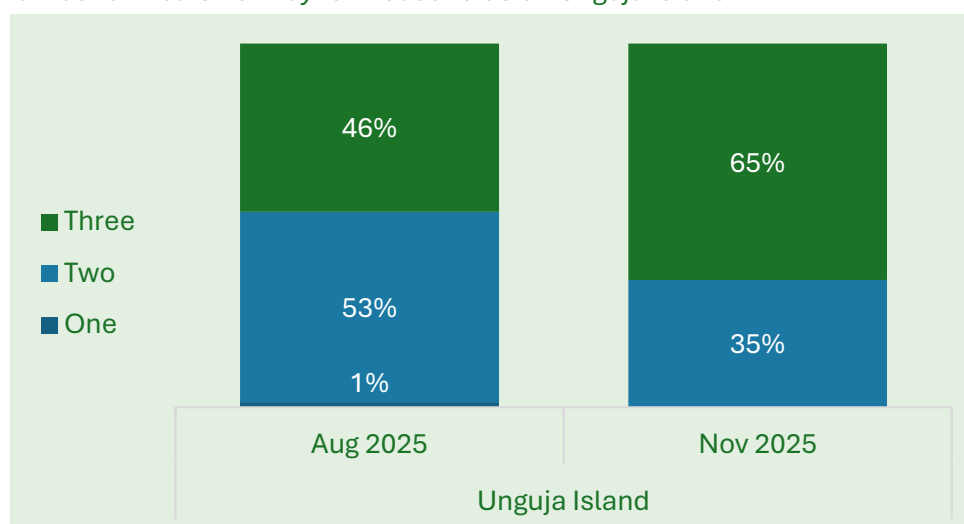
Farmer families in Unguja Island in Zanzibar are affected by climate change due to the destruction of permanent trees caused by human activities including drilling of big dams by taking sands for construction in the cultivation areas and in some coastal areas, sea water has penetrated to farming land due to too much mangroves destruction. Due to that destruction, the district suffers in reduced areas for the food crops production, hence decreases food requirement in households. The significant number of smallholder farmers in the Zanzibar depend on rain-fed farming system with no use of modern and mechanized farming technologies and machinery but relying on local methods of farming which accounting for subsistence production just for family consumption. Rain comes late and for a short period. This directly impacts on the farming system since our kind of agriculture is rain-fed hence the farmers can no longer plant in the right time and sometimes when they plant the crops wither due to little rainfall. This situation decreases income.





The November 2025 data from Unguja Island, Zanzibar includes 80 households and 20 FFLGs. Most households consist of 4-6 members (46%), while 24% have 1-3 members and 23% have 7-9 members. In addition, 8% of households, six in total, consist of 10 or more members. All households report growing crops and 80% also keep livestock. The most common crops include vegetables, root tubers and cash crops, while chickens and ducks are the most frequently kept livestock. Responsibilities related to irrigation of crops, watering livestock and maintaining WHTs are generally shared among all household members.

**Figure 4.1:** Number of Meals Per Day for Households on Unguja Island



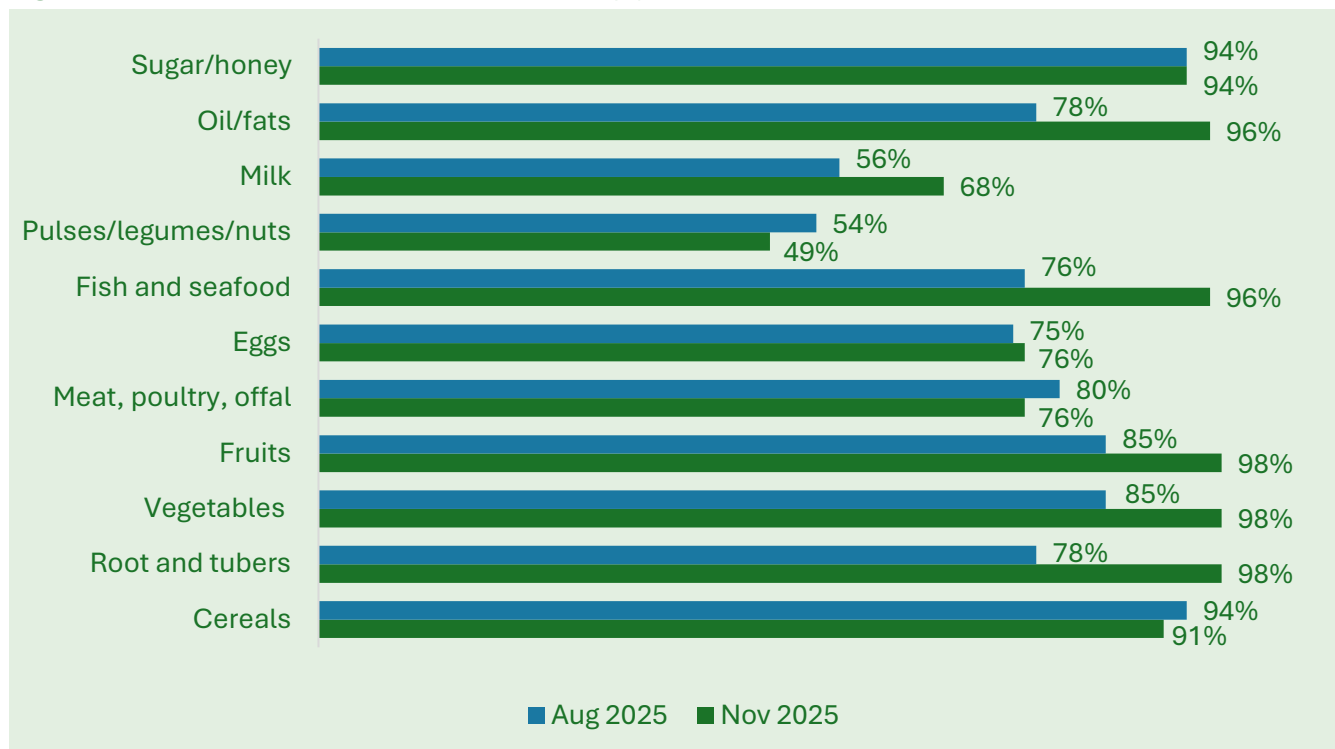
Note: HH-dataset August and November 2025, Unguja Island. N (Aug = 80 and Nov = 80). Q14 Looking into the last week, how many meals did your family eat per day?

In November, 65% of households report consuming three meals per day, while 35% reported consuming two. This represents an improvement from August, when only 46% reported consuming three meals per day. Despite the positive development, Unguja Island still has the lowest share of households consuming three meals per day compared to the other districts.

Households on Unguja Island show a highly diverse diet, where more than 85% of households consumed cereals, vegetables, fruits and sugar/honey in the last 24 hours. Especially, there is an increase in households eating oil or fats and fish or seafood.



**Figure 4.2:** Food Varieties for Households on Unguja Island in the Previous 24 Hours of the Interview

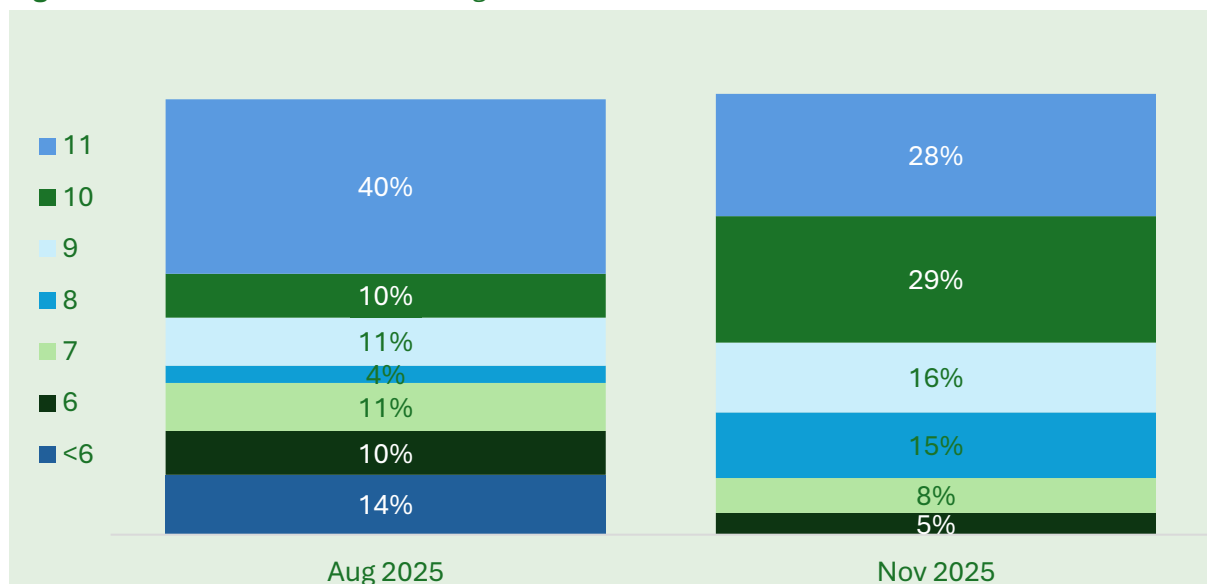


Note: HH-dataset August and November 2025, Unguja Island. N (Aug = 80 and Nov = 80). Q16. What food varieties compose your meal/prepared and consumed according to this list?

The average HDDS in November was 9.4, which is the highest among the five districts, and an increase from 8.5 in August. At the same time Figure 4.3 illustrates that no household scores below 6 in November compared with 14% scoring this low in August. However, the share of households achieving the maximum score of 11 declined from 40% in August to 28% in November.



**Figure 4.3** Distribution of HDDS in August and November 2025 for Households in Chamwino



Note: HH-dataset August and November 2025, Unguja Island. N (Aug = 80 and Nov = 80). Sum of Q16. What food varieties compose your meal/prepared and consumed according to this list?

Food shortages are primarily experienced from January to March, reported by 58% of households. Only 19% report shortages during October-December, the period where the November data was collected. An additional 8% state never experiencing food shortages.

#### 4.1 Water Access and Progress in Testing and Implementing WHT

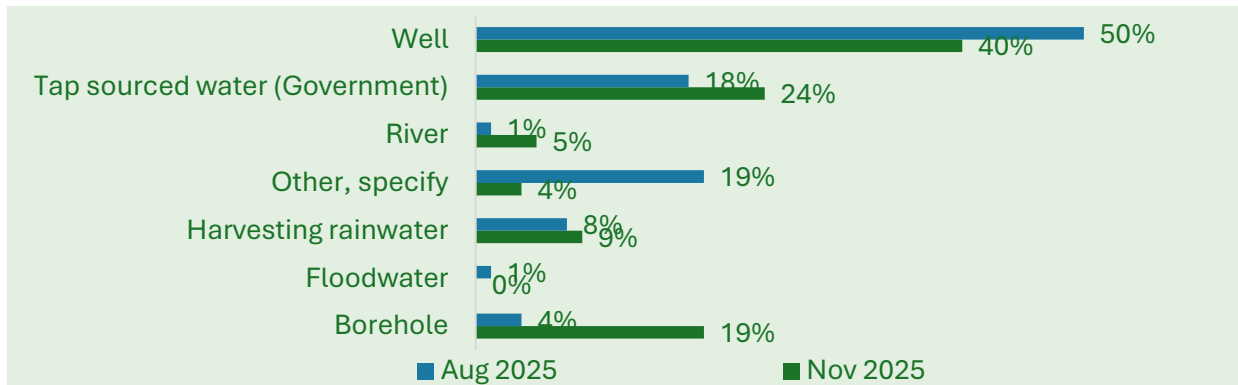
The main water sources on Unguja Island are wells, reported by 40%, tap sourced water from the government and boreholes. Only 9% of households report rainwater harvesting as their main water source, which is nearly unchanged from 8% in August. Nevertheless, all 80 households report harvesting and storing water, and 79 households report having implemented WHTs since 2025.

A positive development is seen in the number of months households are provided with water for crops and livestock. In November, 30% report having access to water 10-12 months per year, which is an increase from 23% in August. However, 55% still report access to water for



only 1-3 months per year, unchanged from August, which remains a challenge in becoming water resilient.

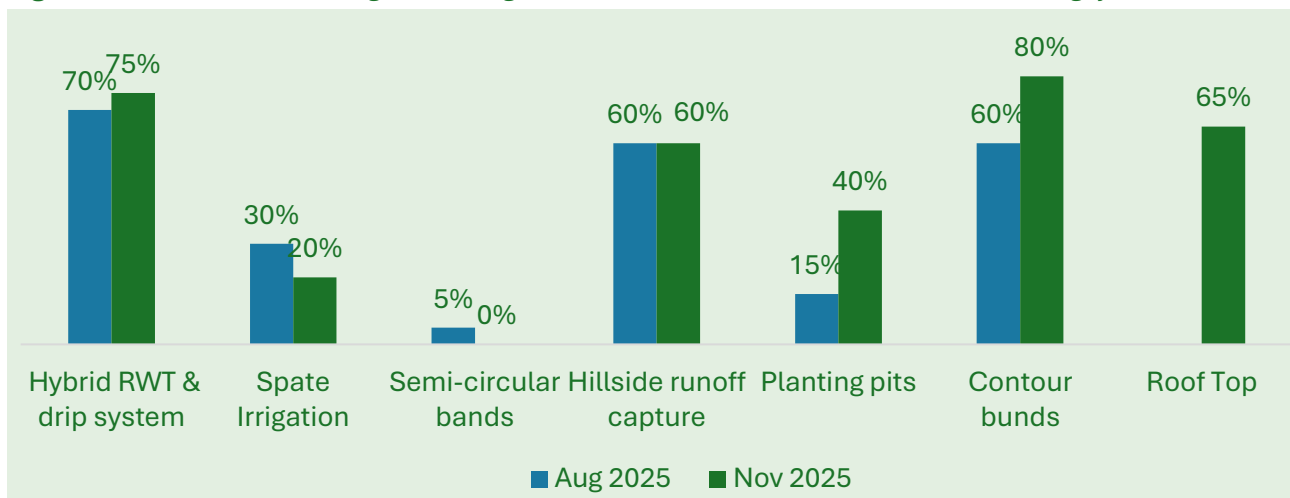
**Figure 4.1.1: Main Water Source for Households on Unguja Island**



Note: HH-dataset August and November 2025, Unguja Island. N (Aug = 80 and Nov = 80). Q3. What is the main current water source for livestock and crops?

In August, the primary WHTs tested by FFLGs on Unguja Island included hybrid RWT & drip systems, hillside runoff capture and contour bunds. By November, planting pits and roof top were also widely tested. FFLGs further report an increase in household adoption of these technologies, with 55% of the groups reporting that more than 10 households have adopted the tested WHTs.

**Figure 4.1.2 Water Harvesting Technologies Tested or Established in the FFLGs on Unguja Island**

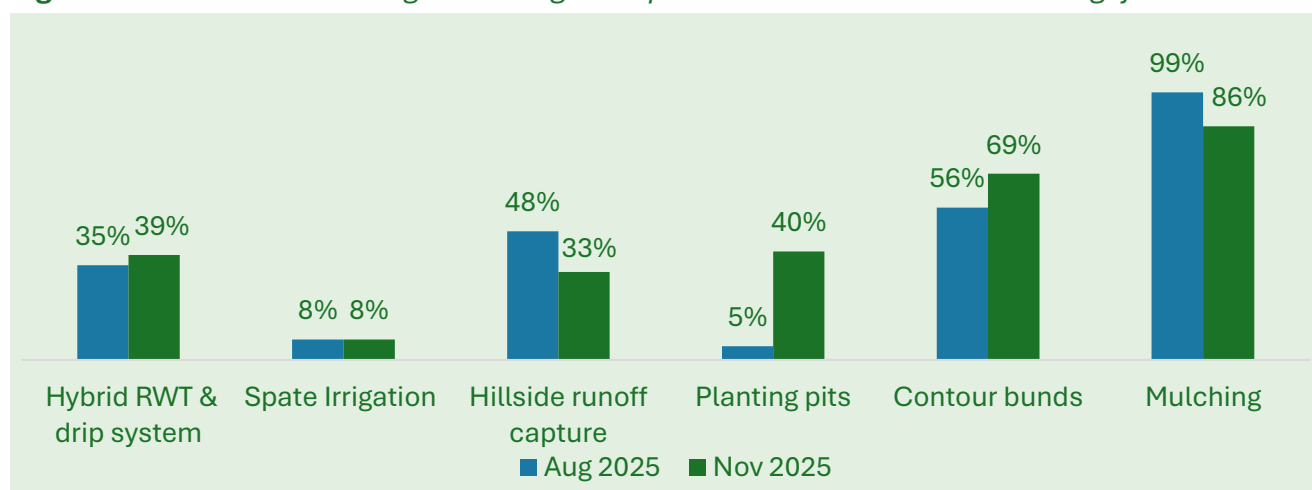


Note: FFLG-dataset August and November 2025, Unguja Island. N (Aug = 20 and Nov = 20). Q1 Since January 2025 which water harvesting technologies have you established or tested in your FFLG?



The average number of WHTs implemented per household on Unguja Island increased slightly from 2.5 in August to 2.8 in November. The modest rise is mainly due to the increased adoption of planting pits. Figure 1.4.3 also shows an increase in contour bonds. The consistently high adoption of mulching is expected, as the technique is already integrated into the ESFROMA program.

**Figure 4.1.3** Water Harvesting Technologies Implemented in Households on Unguja Island



Note: HH-dataset August and November 2025, Unguja Island. N (Aug = 80 and Nov = 80). Q13 Since 2025 have you implemented any WHTs in your HH? Q13.1. If yes, mention the on-farm water management systems/practices.

A large share of households, more than 90%, report having received information about WHT through workshops, training and FFLG rotational visits, which is unchanged from August 2025. A positive development is the increased involvement of the local government. In November, 55% of FFLGs now report receiving information from government sources. Additionally, five groups report participating in study tours to other FFLGs and two report receiving information via television.

This increased access to training and information, especially in government involvement, may help explain why only 5% of FFLGs assess their capacity as low in November, compared with 25% in August. Meanwhile, 80% classify them as medium (75% in August) and 15% as high (0% in August).

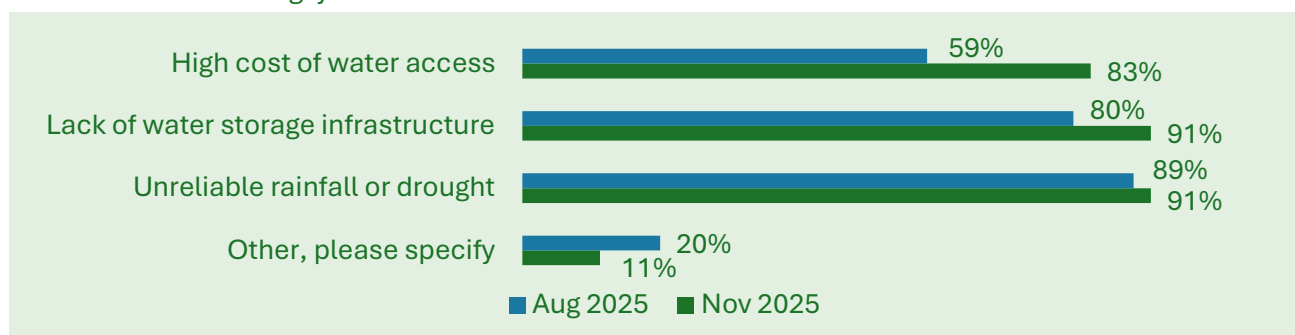


Compared with the other districts, this overall assessment of capacities is relatively high. This raises the question of what might explain the relatively low implementation rate of WHTs among the households. We explore this further in the following section, which examines the key challenges related to establishing WHTs and getting access to water for crops and livestock.

## 4.2 Challenges and Advantages for FFLGS and Households

The most common challenges households face in accessing water for their livestock and crops in November 2025 are unreliable rainfall or drought and lack of water storage infrastructure. More than 90% of households mention these constraints. In addition, there has been a substantial increase in households identifying the high cost of water access as a challenge, rising from 59% in August to 83% in November. A few households also report electric power cuts, long distances to water sources and time consuming in the collection of water as additional barriers in accessing water.

**Figure 4.2.1:** Households Challenges in Accessing Water for Livestock and Crops for August and November 2025 on Unguja Island



Note: HH-dataset August and November 2025, Unguja Island. N (Aug = 80 and Nov = 80). Q12. What challenges do you face in accessing water for your livestock and crops?

When examining the challenges related to establishing, using and maintaining WHTs, FFLGs especially highlight the high costs. This challenge is twofold: half of the groups mention a lack of initial capital and high price of equipment such as storage tanks and pipes, while five groups report high maintenance costs for the existing WHTs as a challenge. The one household that has not yet implemented any WHT also attributes this to lack of funds.



Encouraging, only two groups mention lack of knowledge, skills and awareness as a challenge in November, compared with nearly two-thirds of FFLGs in August. On the other hand, concerns about climate uncertainty have increased. Half of the FFLGs now identify climate related issues, such as unpredictable rainfall, drought, long dry seasons and climate vulnerability, as a significant challenge, compared with only four groups in August. This indicates that climate-related barriers are increasing on Unguja Island. Additional challenges mentioned include low prioritization and negligence of WHTs among farmers, and situations where harvested water is used primarily for livestock, deprioritizing water for domestic needs.

### *Adjustments Made by FFLGs*

On the positive note, only two FFLGs report not having made any adjustments to their WHTs. The reasons reported are lack of funds and unpredictable rainfall. The remaining groups report various adjustments and improvements. These include introducing new WHTs, such as rooftop rainwater harvesting, cover crops to reduce evaporation and drip irrigation system. Upgrading existing technologies, including adding or replacing water storage tanks and pumps, improving contour bunds using stones and repairing earlier drip irrigation systems. Additionally, most members have been trying 1-3 WHTs recommended within their FFLGs, as well as other locally available techniques, to increase the implementation rate among the households.

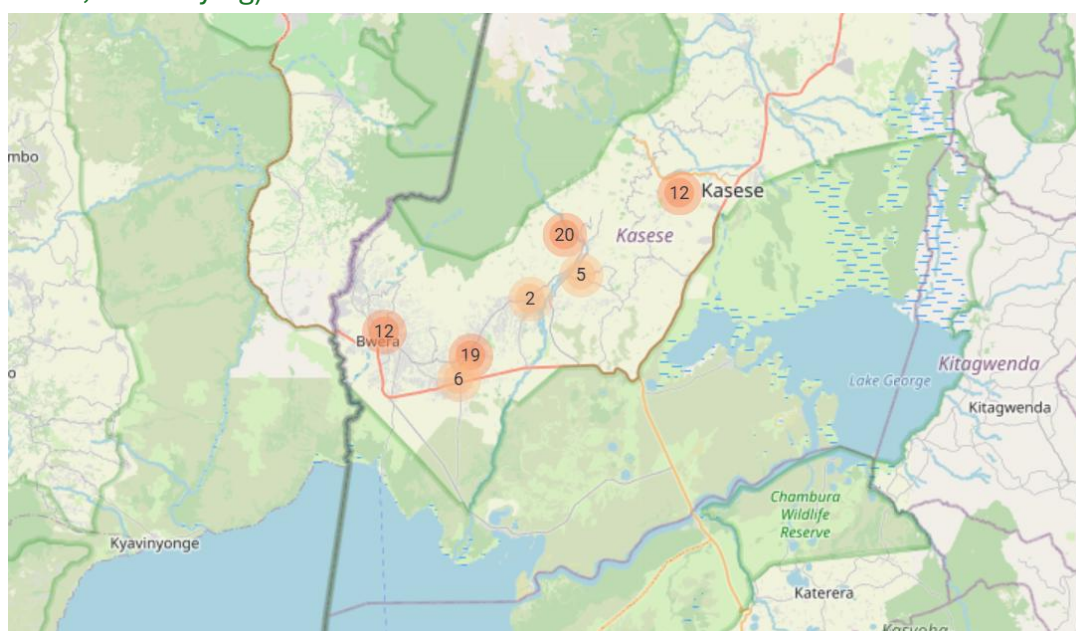
### *Advantages for Individual Households, FFLGs and Community*

The most frequent advantages reported by both FFLGs and individual households include increased productivity, higher crop yields and increased household income. One group specifically mentions that *“the increased income from vegetables production using the harvested rainwater assist in household needs (pay health, education, and other services bills)”*. Several groups also highlight improved water availability during dry seasons, not only for crops and livestock, but also for domestic uses such as cooking, washing dishes and cleaning clothes. Additionally, six groups report that WHT has strengthened household food security, particularly in relation to vegetable productivity. One group mentions that *“It is easier to access vegetables and food items within the community”*. This is consistent with earlier findings showing that the consumption of vegetables on Unguja Island increased from 85% in August to 98% in November.



## 5. Kasese, Uganda

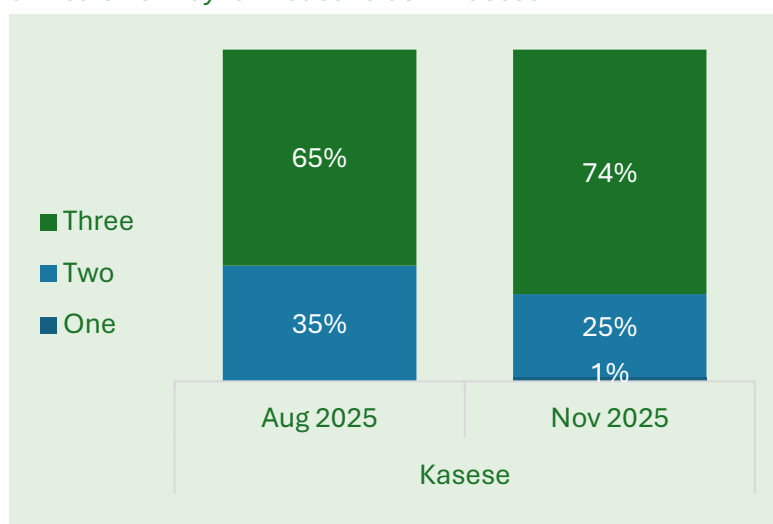
The people of Kasese are predominantly subsistence farmers, growing food to feed their families. The major crops grown in the district include cassava, coffee, maize, cotton, banana plantations, sweet potatoes, and groundnuts on the lower lands. Despite their location along the warm-weather equator line in Uganda, the Rwenzori Mountains, also called the Mountains of the Moon, are covered with snow and glaciers on its peaks. Glaciers used to be permanent, however in recent years, climate change has caused the snow to recede and the glaciers to melt. Increased water flow in these rivers due mainly to changes in rainfall and land degradation caused disastrous flooding, soil erosion and mudslides. In other periods the area experiences severe drought leading to drying up of crops as there is not enough or no water at all for production. Some livestock will die due to dried grazing grounds and inadequate water sources. Some streams of water dry up hence people drink poor quality water or will travel long distances searching for water. Low yield, poor quality and low quantity harvests result in hunger at households. Poor balanced diet hence malnutrition. Rampant theft at households and in the surrounding villages. Deforestation as people look for ways of survival (fuel, construction, brick laying).





The November 2025 data from Kasese, Uganda includes 20 FFLGs and 76 households, representing nine different sub counties. Most households consist of 7-9 members (45%) or 4-6 members (39%). In addition, 11% of households have 10 or more members, while 5% have 1-3 members. All households report growing crops and 92% keep livestock. The crops are diverse, with nearly all households growing legumes and roots and tubers. The most kept livestock are goats, chickens and ducks. Responsibilities related to irrigation, watering livestock and maintaining WHTs are generally shared among all household members.

**Figure 5.1:** Number of Meals Per Day for Households in Kasese



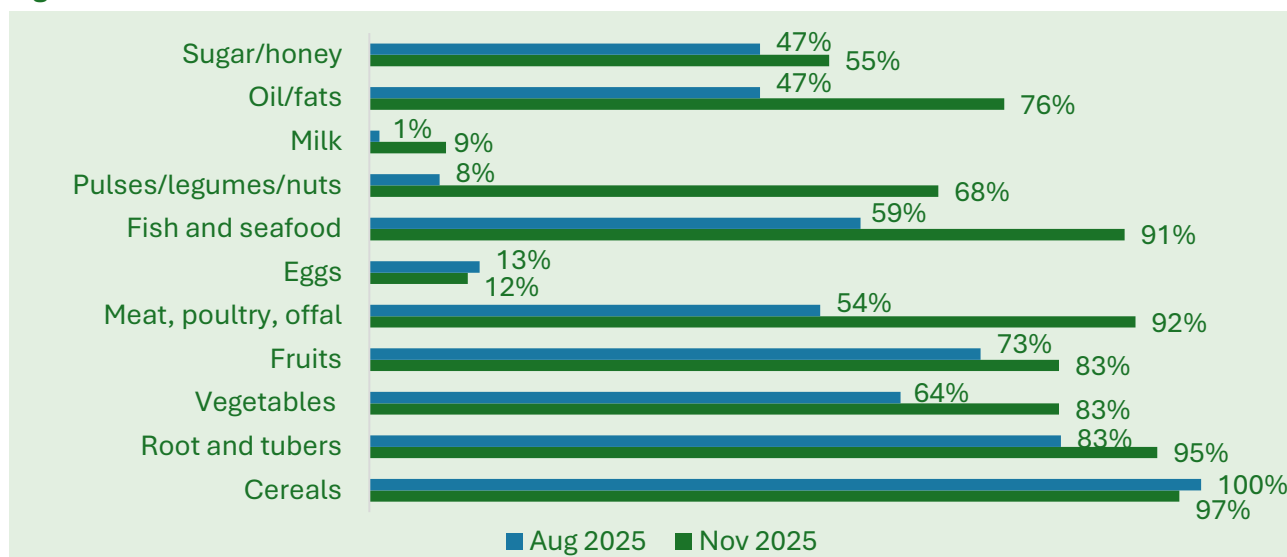
Note: HH-dataset August and November 2025, Kasese. N (Aug = 83 and Nov = 76). Q14 Looking into the last week, how many meals did your family eat per day?

The number of meals per day has improved slightly since August. In November, 74% of households reported eating three meals per day, compared with 71% in August. However, 25% of households still report consuming only two meals per day, placing Kasese toward the lower end compared with the other districts.

When it comes to dietary diversity, more than 80% of households consumed cereals and root and tubers within the previous 24 hours of the interview. Table 5.2 shows notable increases within specific food categories such as pulses, legumes and nuts, fish and seafood and meat, poultry and offal.



**Figure 5.2: Food Varieties for Households in Kasese in the Previous 24 Hours of the Interview**

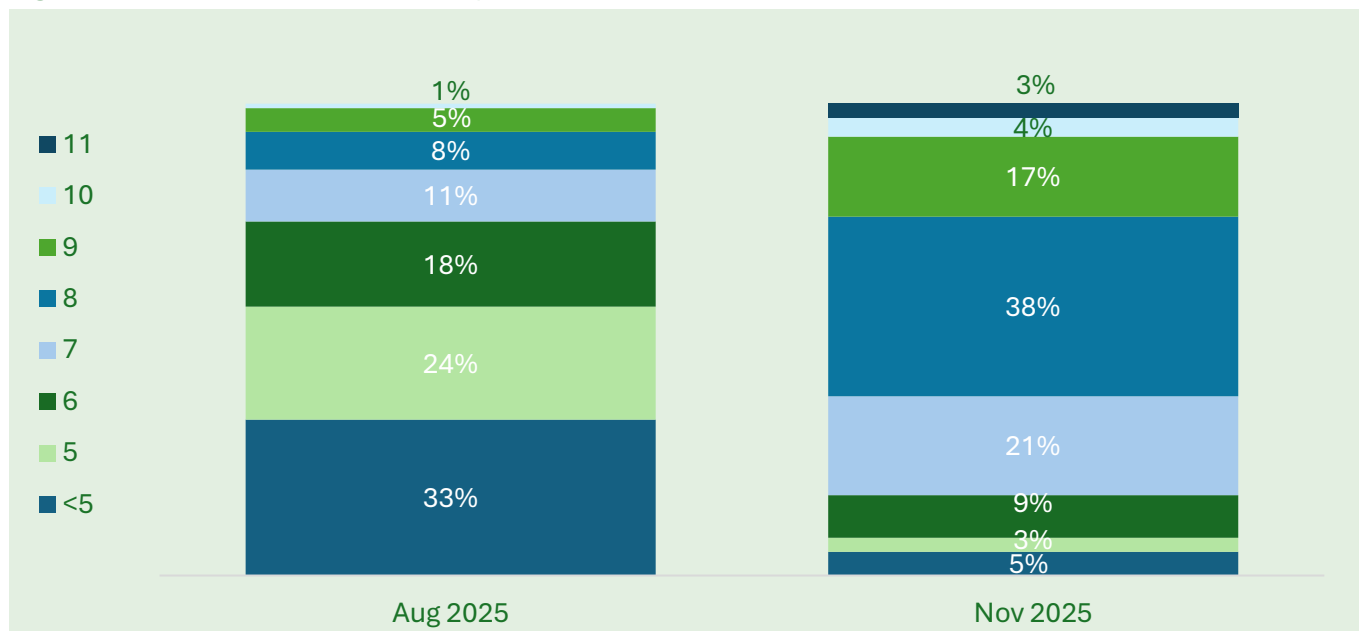


Note: HH-dataset August and November 2025, Kasese. N (Aug = 83 and Nov = 76). N (Aug = 80 and Nov = 80). Q16. What food varieties compose your meal/prepared and consumed according to this list?

Overall, Kasese shows a positive development in dietary diversity. The average HDDS increased substantially from 5.5 in August to 7.6 in November. Furthermore, the share of households achieving a HDDS of 7 or higher rose from 25% in August to 83% in November. Conversely, more than half of the households scored 5 or below in August, compared with only 8% scoring this low in November.



**Figure 5.3** Distribution of HDDS in August and November 2025 for Households in Kasese



Note: HH-dataset August and November 2025, Kasese. N (Aug = 83 and Nov = 76). Sum of Q16. *What food varieties compose your meal/prepared and consumed according to this list?*

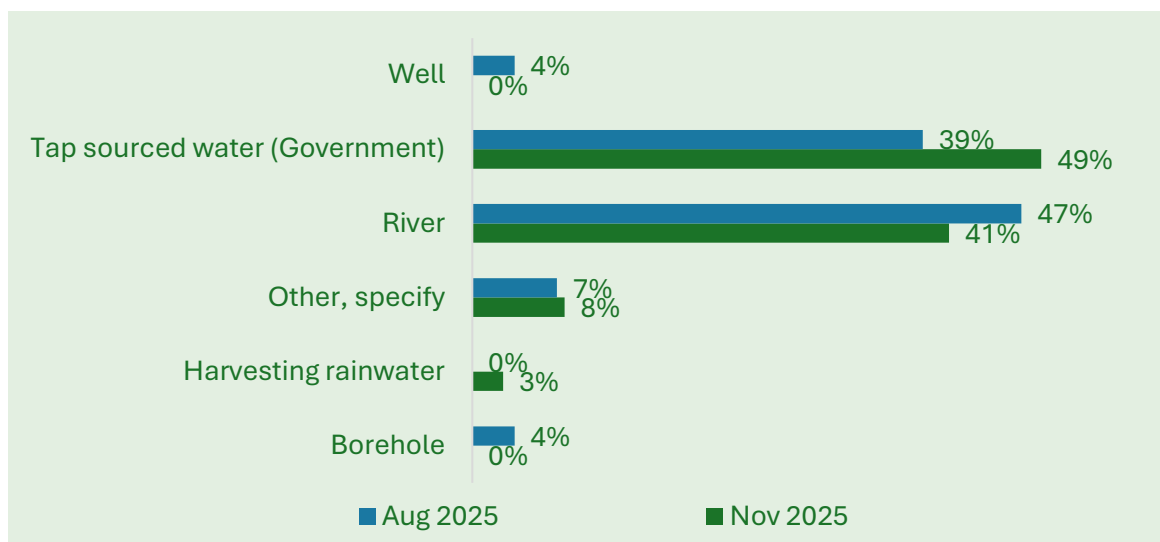
This improvement may partly be caused by the time of food shortages. A majority of households (58%) report experiencing food shortages from July to September, the period during which the August 2025 survey was conducted. However, none reports food shortages in October-December at the time of the November 2025 survey. Additionally, 19% report facing food shortages from January to March, while 24% state they never experience food shortages.

## 5.1 Water Access and Progress in Testing and Implementing WHT

The main water source for livestock and crops in Kasese is tap sourced water supplied by the government or the river. Only 3% of households report harvesting rainwater as their primary water source. The share of households receiving water from these sources for 10-12 months per year decreased from 51% in August to 42% November. However, compared with the other districts, this remains a relatively high proportion. The remaining households report having access to water for only 1-3 months per year, indicating there still are challenges in stable water access.



**Figure 5.1.1: Main Water Source for Households in Kasese**



Note: HH-dataset August and November 2025, Kasese.

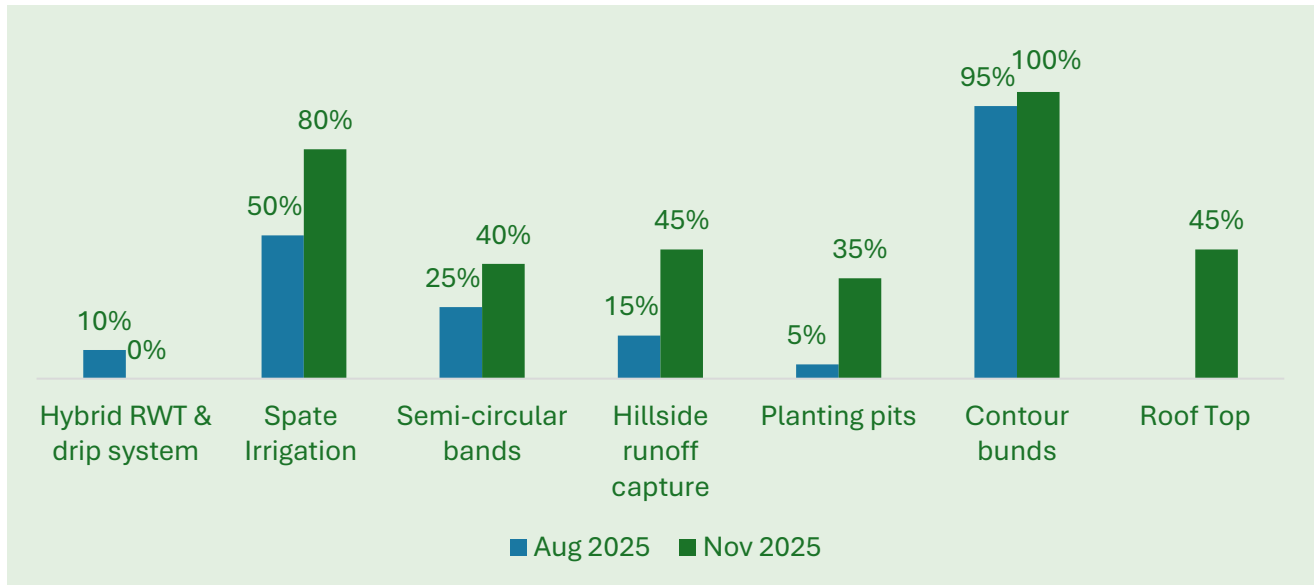
N (Aug = 83 and Nov = 76). Q3. What is the main current water source for livestock and crops?

All households report harvesting and storing water in November, compared with 92% in August. Furthermore, 91% state that they have implemented WHTs in their household since 2025, which is an increase from 75% in August. This entails that in November only seven households have no WHT implemented compared with 21 in August. In addition, 90% of FFLGs report that more than 10 households in their group have adopted the tested WHTs, an increase from 50% in August. This is also reflected in the rise in the average number of implemented WHTs per household, which increased from 1.2 in August to 2 in November.

Figure 5.1.2 shows the specific technologies tested and established in the FFLGs in Kasese. Since August, especially spate irrigation, hillside runoff capture, planting pits and roof top harvesting have seen increased uptake, while contour bunds continue to be the most tested technology.



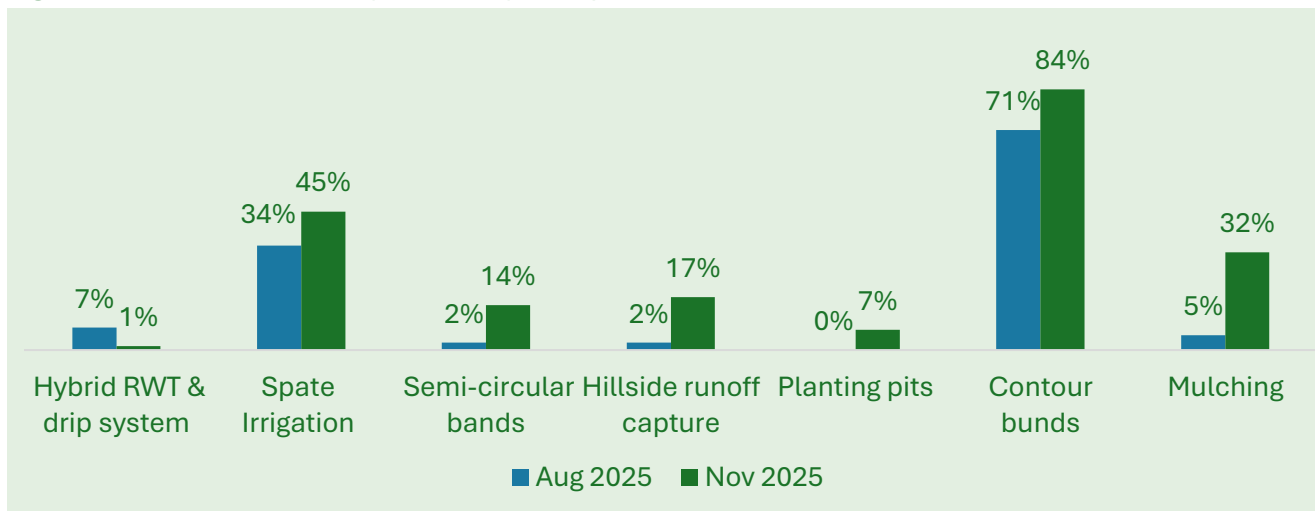
**Figure 5.1.2** Water Harvesting Technologies Tested or Established in the FFLGs in Kasese



Note: FFLG-dataset August and November 2025, Kasese. N (Aug = 20 and Nov = 20). Q1 Since January 2025 which water harvesting technologies have you established or tested in your FFLG?

Household level adoption aligns with the technologies tested within the FFLGs. As shown in Figure 5.1.3, contour bunds and spate irrigation are the most widely implemented WHTs among households.

**Figure 5.1.3** Water Harvesting Technologies Implemented in Households in Kasese



Note: HH-dataset August and November 2025, Kasese. N (Aug = 83 and Nov = 76). Q13 Since 2025 have you implemented any WHTs in your HH? Q13.1. If yes, mention the on-farm water management systems/practices.



Despite this progress, further improvements are still needed to increase implementation rate among households in Kasese. The main reason reported by households for not adopting any WHT is a lack of training and knowledge. These findings correspond with the fact that only 60% of FFLGs have received training or workshops on WHTs. On a positive note, all FFLGs have now participated in rotational visits, compared with 60% in August. Additionally, 15% report receiving information from government sources, which is the same share as in August.

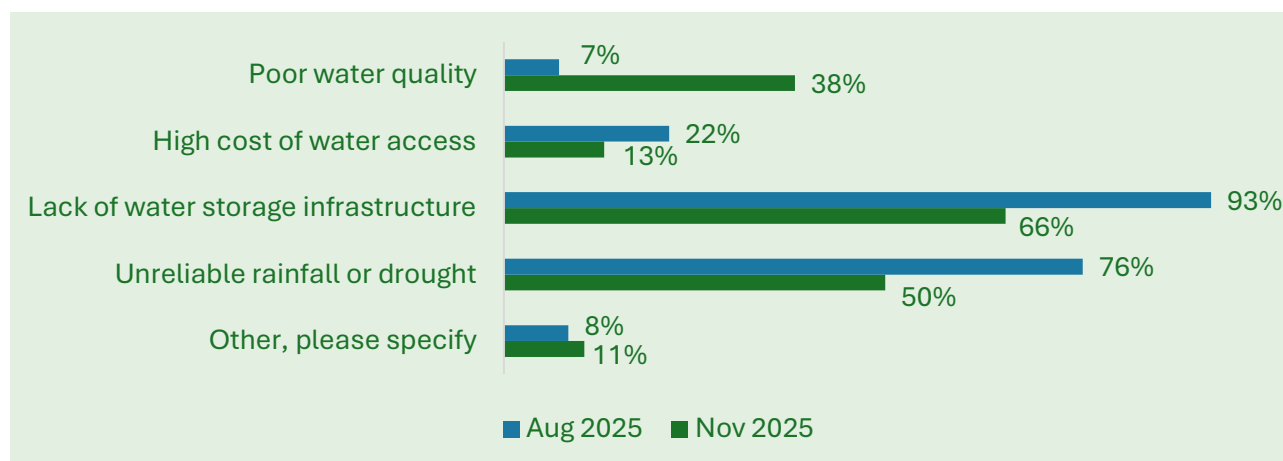
Overall, none of the FFLGs assess their capacity to establish and innovate WHTs as low, which is an improvement from August, where two groups rated themselves at this level. The remaining 19 groups currently assess their capacity as medium, while one group rates its capacity as high. Although this remains a relatively strong overall assessment compared with the other districts, it still indicates a need for continued support to improve more groups from medium to high self-assessed capacity.

## **5.2 Challenges and Advantages for FFLGS and Households**

The most common challenges households in Kasese face in accessing water for their livestock and crops are lack of water storage infrastructure and unreliable rainfall. However, Figure 5.2.1 shows a substantial decrease in the reporting of both challenges from August to November. In contrast, reports of poor water quality increased considerably from 7% in August to 38% in November. This issue is primarily in the households that rely on the river as their main water source. Other frequently mentioned challenges include long distances to water sources, affecting the households whose main water supply comes from boreholes, water springs or the river.



**Figure 5.2.1:** Households Challenges in Accessing Water for Livestock and Crops for August and November 2025 in Kasese



Note: HH-dataset August and November 2025, Kasese. N (Aug = 83 and Nov = 76). Q12. What challenges do you face in accessing water for your livestock and crops?

Within the FFLGs, the most significant challenges reported in both August and November are inadequate equipment and storage facilities, lack of training and cost implications. Additional concerns include difficult terrain that complicates rainwater harvesting. One FFLG notes “When the trenches are filled with silt, it becomes difficult to maintain, hard rocks and tools used for every household are not enough”. Another FFLG are worried that digging trenches may cause landslides, while a group highlights that water for domestic use remains a challenge.

### Adjustments Made by FFLGs

On a positive note, 80% of FFLGs in Kasese report of making adjustments to their WHTs in November compared with 60% in August. The groups that made no adjustments primarily explain it with high initial cost for implementation of new technologies and a continued need for sensitization and training on RWT’s. Among the adjustments reported are training on recommended technologies, establishment of water tank systems, digging underground tanks and introducing new technologies for household adoption such as planting pits, spate irrigation and contour bunds.



### *Advantages for Individual Households, FFLGs and Community*

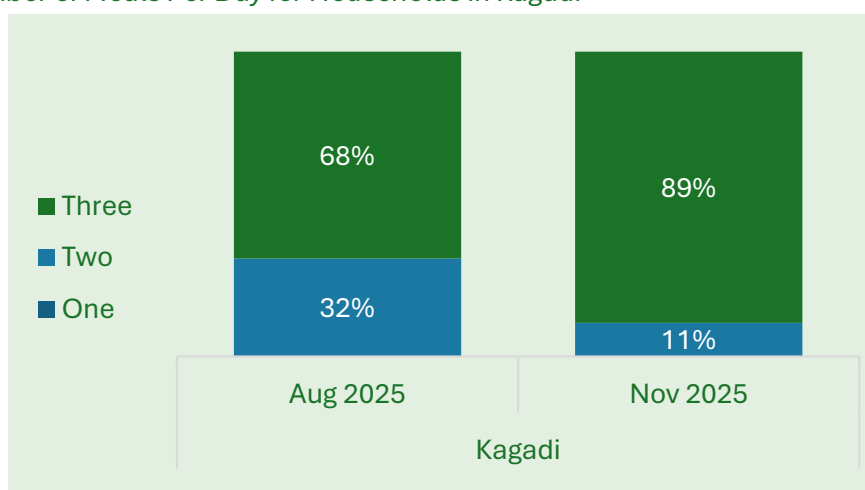
The advantages reported by FFLGs, households and the wider community are substantial. The most common benefits mentioned include increased crop yields, e.g. in coffee fields and production intended for sale, and improved food security with easier access to food. FFLGs also report on higher household income which helps pay school fees. One FFLG notes that water harvesting has increased community engagement and contributed to improved overall livelihood.





The November 2025 data from Kagadi, Uganda includes 21 FFLGs and 82 households across seven sub-counties. Most households consist of 7-9 members (40%) or 4-6 members (33%). In addition, 16% have 10 or more members, while 11% consist of 1-3 members. All households grow crops and keep livestock. More than 90% grow vegetables, legumes, cereals and roots or tubers, while the most frequently kept livestock are pigs, chickens and ducks. Responsibilities related to irrigation and watering livestock falls mainly on women (85% of households) and children (60% of households). Men only participate in 29% of households. A similar pattern is observed for the maintaining of existing water harvesting technologies in the farmer groups, where women and children also carry the main responsibilities.

**Figure 6.1:** Number of Meals Per Day for Households in Kagadi

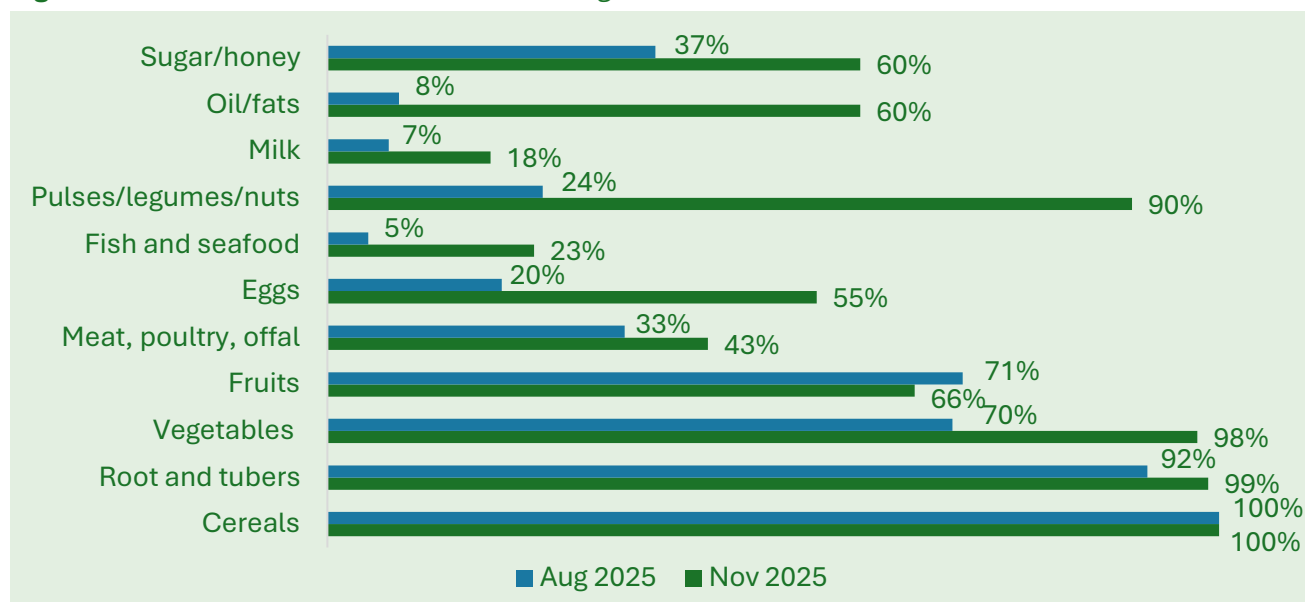


Note: HH-dataset August and November 2025, Kagadi. N (Aug = 87 and Nov = 82). Q14 Looking into the last week, how many meals did your family eat per day?

The number of meals per day has improved notably since August. In November, 89% of households reported eating three meals per day, compared to 68% in August. Along with Wakiso, Kagadi has the highest share of households consuming three meals daily among the districts. Dietary diversity has also improved substantially. Figure 6.2 shows how at least 90% of households consumed cereals, root and tubers, vegetables and pulses, legumes or nuts within the 24 hours preceding the interview. Additionally, the shares consuming sugar and honey, oil and fats, eggs and pulses, legumes or nuts increased from August to November.



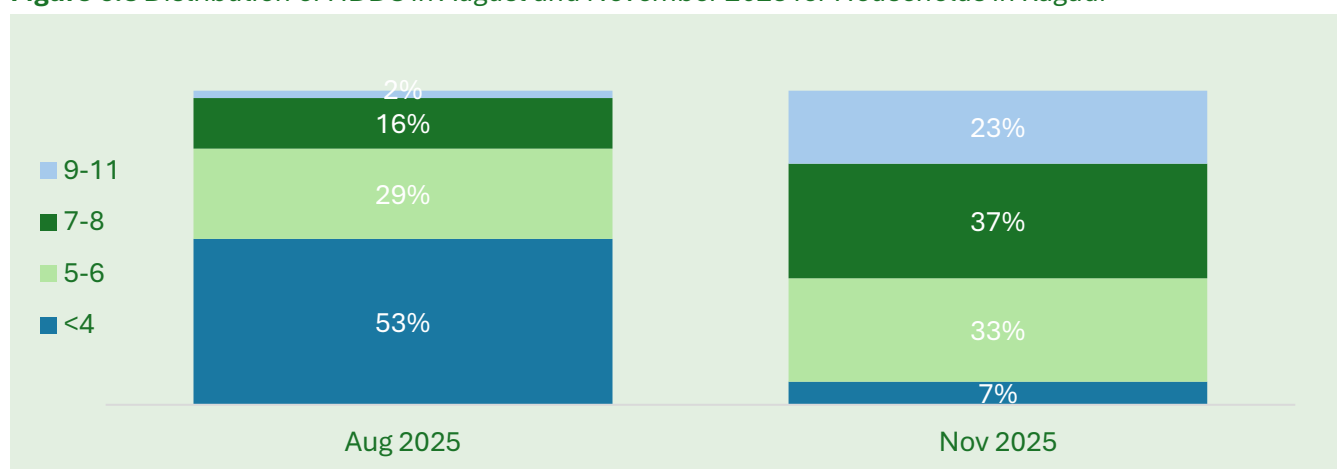
**Figure 6.2:** Food Varieties for Households in Kagadi in the Previous 24 Hours of the Interview



Note: HH-dataset August and November 2025, Kagadi. N (Aug = 87 and Nov = 82). Q16. What food varieties compose your meal/prepared and consumed according to this list?

The average HDDS rose from 4.7 in August to 7.1 in November. Figure 6.3 illustrates that more than half of the households scored 4 or below in August, whereas this applied to only 7% in November. Conversely, 23% of households reached a HDDS of 9 or higher in November compared with just 2% in August.

**Figure 6.3** Distribution of HDDS in August and November 2025 for Households in Kagadi



Note: HH-dataset August and November 2025, Kagadi. N (Aug = 87 and Nov = 82). Sum of Q16. What food varieties compose your meal/prepared and consumed according to this list?

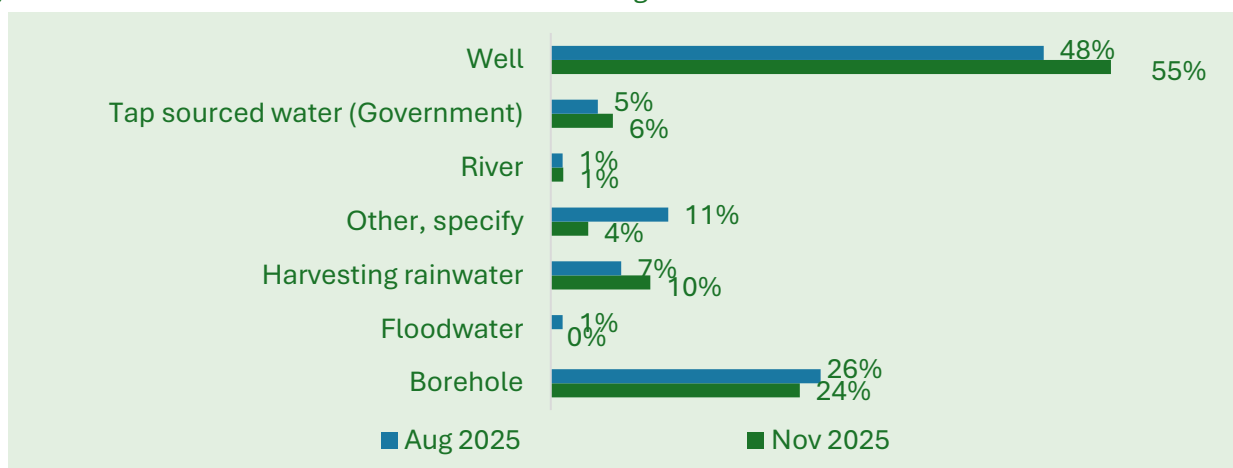


Food shortage periods appear less often in Kagadi compared with other districts. In November, 61% of households reported never experiencing food shortages throughout the year, which is an encouraging improvement from 28% in August. Only 20% experience food shortage from April to June, and 13% from January to March.

## 6.1 Water Access and Progress in Testing and Implementing WHT

The main water source for livestock and crops in Kagadi in November 2025 are wells, reported by 55%, and boreholes, reported by 24%. Only 10% report harvesting rainwater as their primary water source, which is a small increase from 7% in August 2025. Unfortunately, the share of households with water available for 10-12 months per year decreased from 44% in August to 24% in November. At the same time, 44% of households report having access to water from these sources for only 1-3 months per year. Positively, the share reporting access for 7-9 months increased from 6% to 23%.

**Figure 6.1.1:** Main Water Source for Households in Kagadi



Note: HH-dataset August and November 2025, Kagadi.

N (Aug = 87 and Nov = 82). Q3. What is the main current water source for livestock and crops?

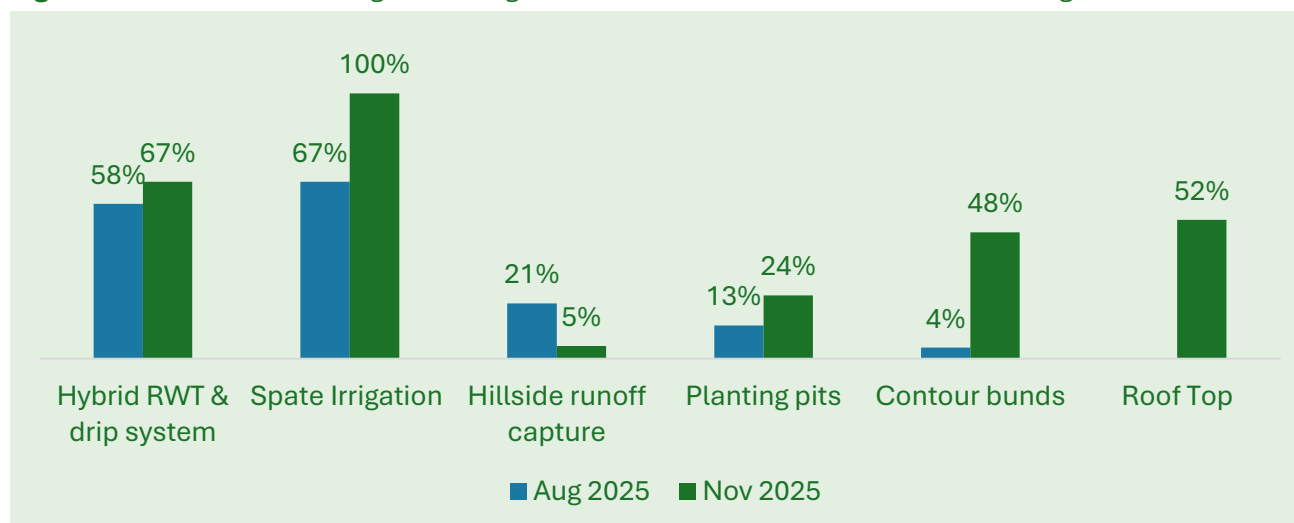
All households in Kagadi report harvesting and storing water in November, an increase from 91% in August. However, only 87% state that they have implemented at least one in 2025, which is a modest increase from 84% in August. On the positive side, the share of FFLGs reporting that more than 10 households have adopted the tested WHTs rose from 13% in



August to 38% in November. Still, 52% report an adaptation rate of only 1-5 households, indicating variation in uptake of the technologies across the farmer groups.

The most tested and established technologies in the FFLGs include spate irrigation, hybrid RWT and drip system and roof top harvesting. Contour bunds increased substantially with 44 percentage-point from August to November, while hillside runoff capture declined.

**Figure 6.1.2** Water Harvesting Technologies Tested or Established in the FFLGs in Kagadi

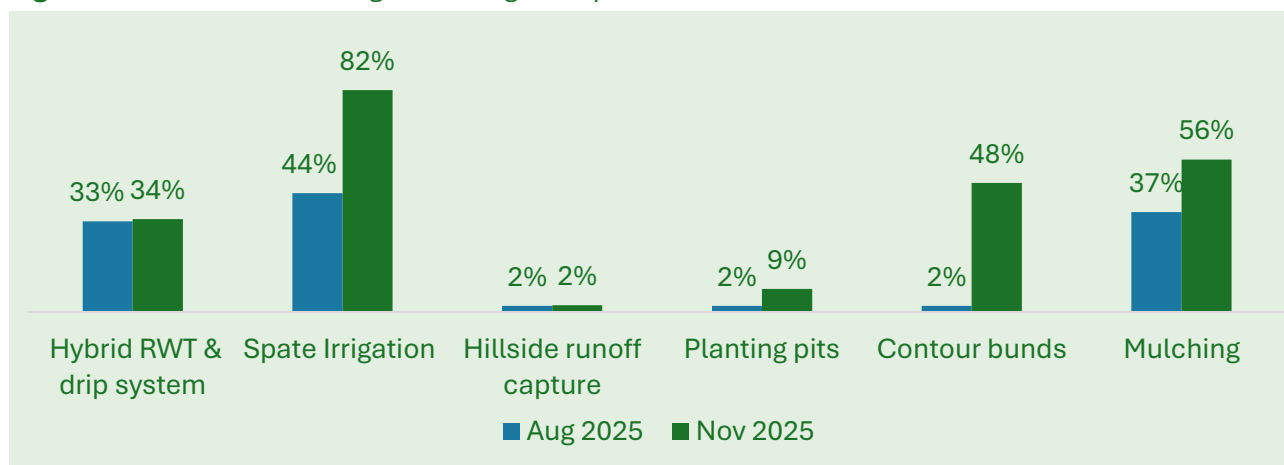


Note: FFLG-dataset August and November 2025, Kagadi. N (Aug = 24 and Nov = 21). Q1 Since January 2025 which water harvesting technologies have you established or tested in your FFLG?

Household-level implementation of WHT reflects these trends. The average number of WHTs implemented per household increased from 1.2 in August to 2.3 in November, indicating an average of one additional technology adopted per household. As in the FFLGs, there has been growth in the implementation of spate irrigation and contour bunds, along with a rise in the use of mulching.



**Figure 6.1.3** Water Harvesting Technologies Implemented in Households in Kasese



Note: HH-dataset August and November 2025, Kagadi. N (Aug = 87 and Nov = 82). Q13 Since 2025 have you implemented any WHTs in your HH? Q13.1. If yes, mention the on-farm water management systems/practices.

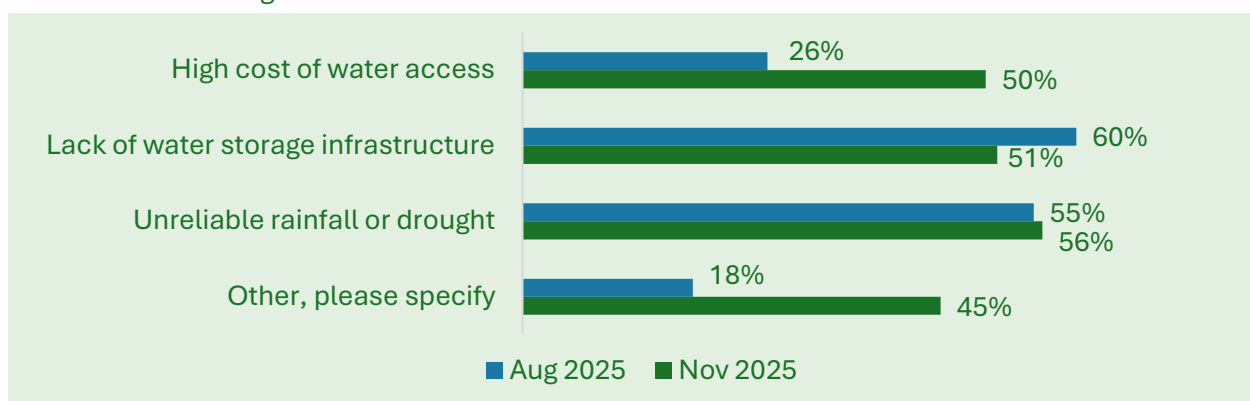
A significant positive development is seen in capacity assessments. In November, 57% of FFLGs rated their capacity to establish and innovate WHTs as high, whereas none did so in August. No group assesses its capacity as low in November compared with 25% in August. This improvement may be linked to the fact that all groups have received workshops, training and rotational visits on WHTs. Additionally, 25% of FFLGs report receiving information from government sources, up from 8% in August. While this indicates room for greater local involvement, it represents meaningful progress.

## 6.2 Challenges and Advantages for FFLGS and Households

About half of all households in Kagadi report unreliable rainfall or drought and lack of water storage infrastructure as major challenges in accessing water for their livestock and crops. In addition, 50% report high cost of water access in November, compared with 25% in August. Further 35% indicates that long distances to water sources pose a challenge, especially among households relying on water from wells. The eleven households that have not implemented any WHTs explain this by lack of capital, insufficient resources and waiting for rotational labor support.



**Figure 6.2.1:** Households Challenges in Accessing Water for Livestock and Crops for August and November 2025 in Kagadi



Note: HH-dataset August and November 2025, Kagadi. N (Aug = 87 and Nov = 82). Q12 What challenges do you face in accessing water for your livestock and crops?

Within the FFLG's, the main challenges related to establishing and maintaining WHTs are also cost-related. Groups highlight the high costs of purchasing, establishing and maintaining the technologies. Several groups also report challenges with mud, which results in dirty water.

### Adjustments Made by FFLGs

In November, 57% of FFLGs report of making adjustments to their WHTs, a decrease from 88% in August. However, the reasons for not making any adjustments are positive, and all 43% explain that they made no adjustments, because the existing technologies are already easy to adopt. For groups that did adjust, the improvements include construction and establishment of underground tanks, building permanent pits in different shapes, digging trenches and working together as a group through rotational labor.

### Advantages for Individual Households, FFLGs and Community

Across FFLGs, households and the wider community the advantages of WHTs are widespread. The most common benefits include increased crop yields, particularly in kitchen gardens, improved livestock health and greater food security through a more balanced diet with a variety of vegetables available. Furthermore, several groups report on increased household income and the ability to make weekly savings within the group. One group notes a more unexpected benefit: "Reduced causes of theft of stuff since most of them are adapting the low-cost technologies.", indicating that the project can have social effects for entire

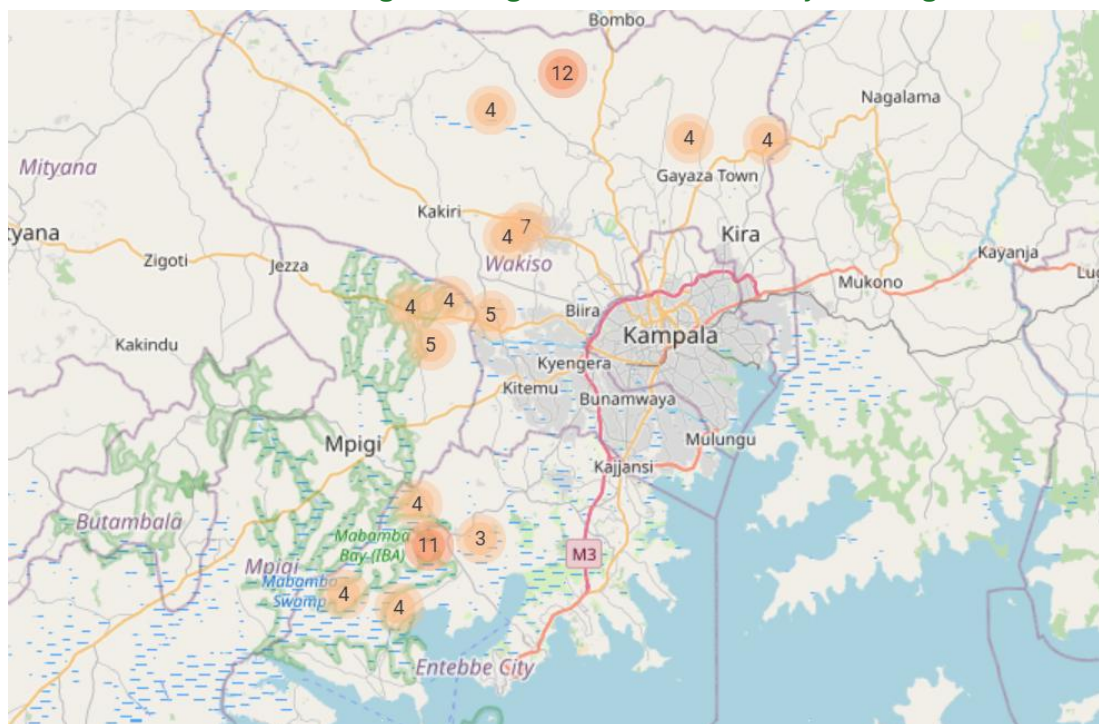


communities. This is also clear by the fact that some groups report of increased willingness and interest among community members to join farmer groups, as well as greater community appreciation of the project as a whole.



## 7. Wakiso, Uganda

Unreliable rainfall and change in rainfall patterns. The long rains used to come in March to May whilst the short rains October to November. This has changed to the rain comes late in May and for a short period. This directly impacts on the farming system since this kind of agriculture is rain-fed hence the farmers can no longer plant in the right time and sometimes when they plant the crops wither due to little rainfall. Flooding of lowlands and rivers, for example, river Mayanja which originates from Wakiso and feeds into Lake Victoria has been flooding since 2010 during the rainy season. Because the land is left bare, rainwater is collected downstream into the rivers. This condition exacerbates flooding and hence bursting of the river which impacts the nearby farming communities by causing losses of having their gardens washed away. During the rainy season some areas of Wakiso are abandoned by the residents due to their houses being submerged in water caused by flooding.

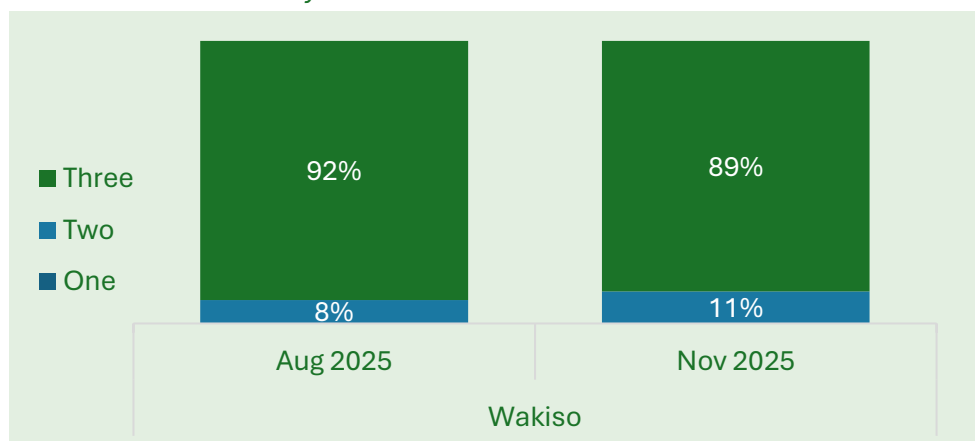




The November 2025 data from Wakiso, Uganda includes 20 FFLGs and 79 households across six sub-counties. Most households consist of 4-6 members (53%), 7-9 members (27%) or 1-3 members (19%). Almost all households both keep livestock and grow crops. The most grown crops are vegetables, legumes, cereals and root tubers, while the most frequently kept livestock include chickens, ducks, pigs and goats. Responsibilities related to irrigation, watering livestock and maintaining WHTs are generally shared among all household members.

In November, 89% reported eating three meals per day in the previous week, which is a slight decrease from 92% in August. However, Wakiso still has a higher share of households consuming three meals daily among all districts. The remaining 11% report eating two meals per day.

**Figure 7.1:** Number of Meals Per Day for Households in Wakiso

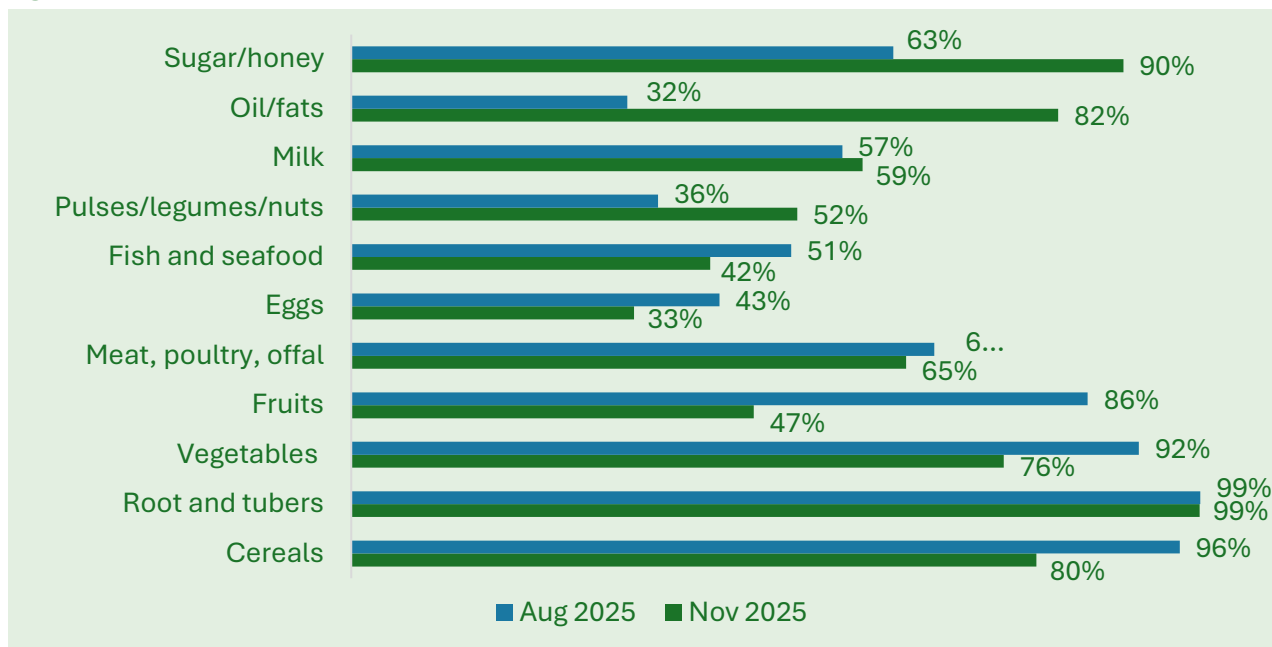


Note: HH-dataset August and November 2025, Wakiso. N (Aug = 84 and Nov = 79). Q14 Looking into the last week, how many meals did your family eat per day?

Figure 7.2 shows that the most frequently consumed food groups within the previous 24 hours of the interview are root and tubers, sugar or honey, oil or fats and cereals. At the same time, consumption of fruits and vegetables decreased, which may also reflect seasonal changes.



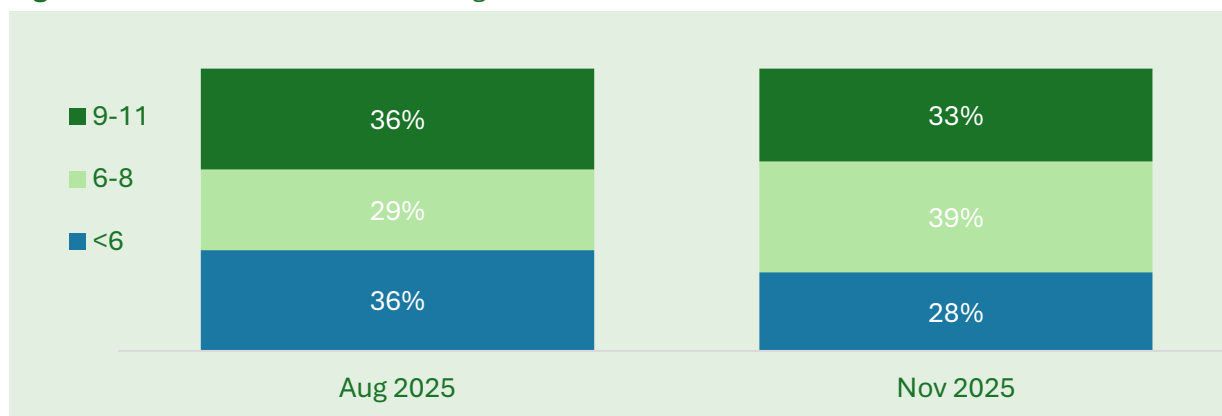
**Figure 7.2: Food Varieties for Households in Wakiso in the Previous 24 Hours of the Interview**



Note: HH-dataset August and November 2025, Wakiso. N (Aug = 84 and Nov = 79). Q16. What food varieties compose your meal/prepared and consumed according to this list?

The average HDDS in Wakiso was 7.2 in November, unchanged from August. However, the distribution of scores has shifted slightly. The share of households scoring below six fell from 36% in August to 28% in November. Additionally, the share scoring 9 or higher decreased from 36% in August to 33% in November.

**Figure 7.3 Distribution of HDDS in August and November 2025 for Households in Wakiso**



Note: HH-dataset August and November 2025, Wakiso. N (Aug = 84 and Nov = 79). Sum of Q16. What food varieties compose your meal/prepared and consumed according to this list?

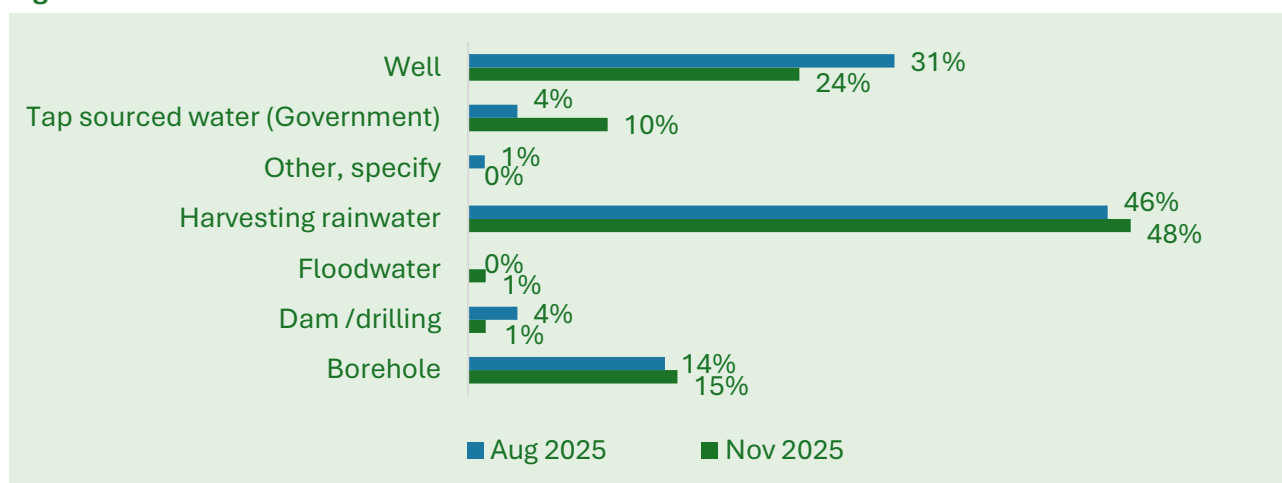


Food shortages are relatively uncommon in Wakiso. In November, 77% of households reported never experiencing food shortages throughout the year. Only 10% reported shortages during respectively January-March or July-September.

## 7.1 Water Access and Progress in Testing and Implementing WHT

The main water source for livestock and crops in Wakiso in November is harvesting rainwater, reported by 48% of the households. In addition, 24% rely on wells, 15% on boreholes and 10% on tap sourced water from the government. Only 23% of households are provided with water from these sources for 10-12 months of the year, while 54% have access for only 1-3 months. Although this is an improvement from 68% in August, it still indicates substantial room for strengthening water availability throughout the year.

**Figure 7.1.1:** Main Water Source for Households in Wakiso



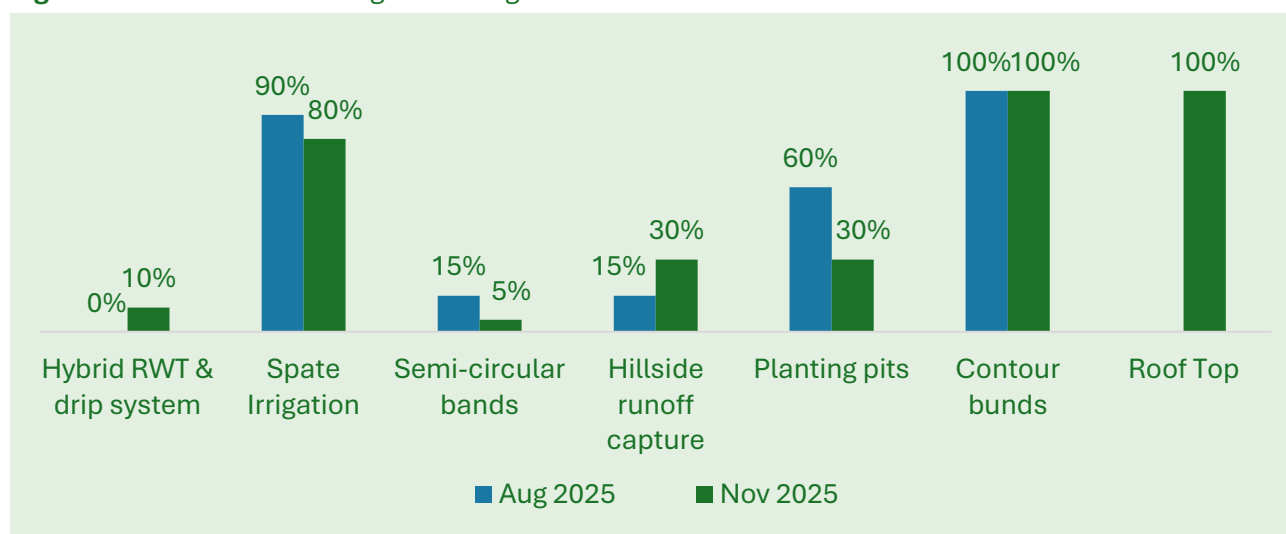
Note: HH-dataset August and November 2025, Wakiso. N (Aug = 84 and Nov = 79). Q3. *What is the main current water source for livestock and crops?*

A total of 94% of households report harvesting and storing water in November, an increase from 79% in August. Furthermore, 96% state that they have implemented at least one WHT in their HH in 2025. At FFLG-level, 65% report that 6-10 households have adopted the tested technologies, compared with 40% in August. Furthermore only 30% report adoption among just 1-5 households, which is down from 50% in August.



The most tested and established technologies in the FFLGs include contour bunds, roof top harvesting and spate irrigation. Planting pits, however, decreased in testing by 30 percentage points since August, indicating the groups have not moved on to establishing the technology.

**Figure 7.1.2** Water Harvesting Technologies Tested or Established in the FFLGs in Wakiso

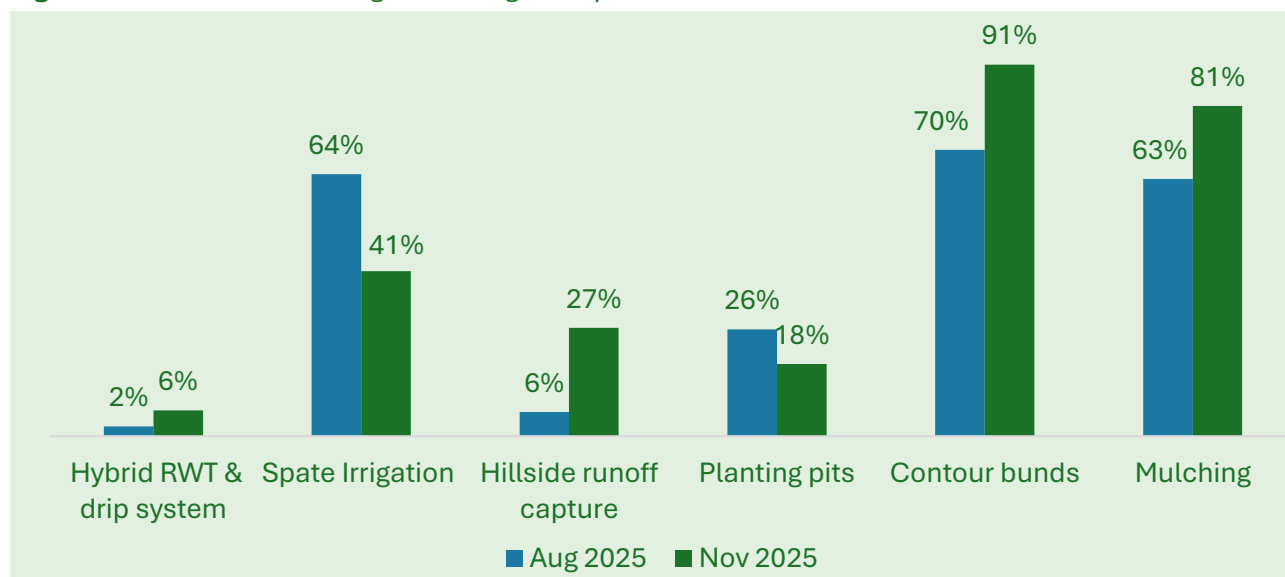


Note: FFLG-dataset August and November 2025, Wakiso. N (Aug = 20 and Nov = 20). Q1 Since January 2025 which water harvesting technologies have you established or tested in your FFLG?

Household-level implementation reflects the same trends. The most widely implemented technologies include contour bunds, mulching and spate irrigation, although the adoption of spate irrigation has decreased since August. A small decline is also visible for planting pits, supporting the argument that this technology may not be the best fit for households in Wakiso. At the same time, there has been a rise in the use of hillside runoff capture. Overall, the average number of WHTs implemented per household increased slightly from 2.3 in August to 2.6 in November.



**Figure 7.1.3** Water Harvesting Technologies Implemented in Households in Wakiso



Note: HH-dataset August and November 2025, Wakiso. N (Aug = 84 and Nov = 79). Q13 Since 2025 have you implemented any WHTs in your HH? Q13.1. If yes, mention the on-farm water management systems/practices.

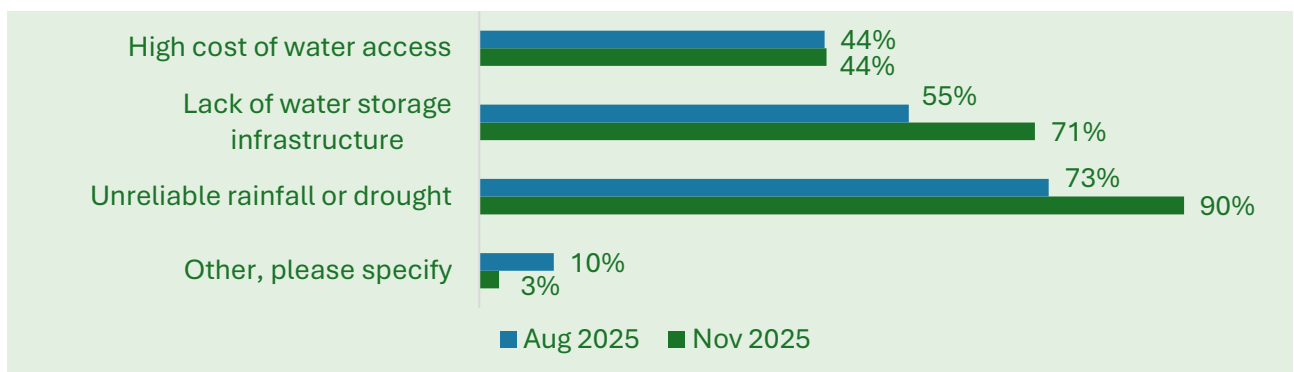
Regarding capacity, 80% of FFLGs assess their ability to establish and innovate WHTs as medium, which represents an increase from 70% in August. The remaining 20% assess their capacity as low, meaning that no group considers its capacity to be high. All FFLGs report having received workshops, training and rotational visits to learn about WHTs. However, none report receiving information from government sources, demonstrating that there is still significant potential for increased local government involvement and support.

## 7.2 Challenges and Advantages for FFLGS and Households

The most significant challenge households face in accessing water for livestock and crops is unreliable rainfall or drought, reported by 90% of households and up from 73% in August. This is followed by lack of water storage infrastructure, reported by 71%, and high cost of water access, reported by 44%.



**Figure 7.2.1: Households Challenges in Accessing Water for Livestock and Crops for August and November 2025 in Wakiso**



Note: HH-dataset August and November 2025, Wakiso. N (Aug = 84 and Nov = 79). Q12 What challenges do you face in accessing water for your livestock and crops?



Within the FFLGs several widespread challenges continue to prevent the establishment and maintenance of WHTs. These include lack of storage facilities and materials, high costs of technologies and limited farming space. One group express this clearly: *“The area is becoming densely populated. Some low context specific technologies like contours are difficult to establish”*. The most frequently reported challenge, however, remains the unpredictability caused by climate change and shifting rainfall patterns, which undermines the reliability of rainwater as a water resource.

### *Adjustments Made by FFLGs*

In November, 70% of FFLGs reported having made adjustments to their WHTs, a decrease from 90% in August. Among the six groups that made no adjustments, half explain that their existing technologies are already applicable and adequate. The remaining groups express reasons such as unapplicable technologies or still mobilizing funds. The groups that did make adjustments describe several efforts including: improving existing WHT facilities, introducing lower-cost technologies to make adoption more accessible for low-income households and establishing mini-dams to capture runoff. In addition, some FFLGs purchased low-cost materials and installing smaller storage tanks to reduce upfront costs and supplemented existing systems with additional water sources (e.g., boreholes, pumped wells) to ensure access during dry seasons. Lastly, several groups report on strengthening the group support through rotational labor to reduce labor costs

### *Advantages for Individual Households, FFLGs and Community*

Across FFLGs, households and the wider community the advantages of WHTs are both practical and more wide-reaching in the community. Many groups report that the technologies have led to increased crop and livestock production. Several households emphasize that WHT have improved their access to water, not only for farming but also for domestic use. This reduces the time spent on collecting water, where children no longer have to walk long distances to collect water, thanks to tanks established closer to the communities. Some farmers note that they save money by not having to buy water, while others even generate income because others purchase water from them. A commonly expressed benefit is the increase in food security, because the community can access vegetables all season due to the established technologies. As one group summarized: *“For households engaged in small-scale farming, livestock keeping, or home gardening, water harvesting has improved their*



*resilience against drought and increased potentially their livelihoods*". This improvement in both water resilience and livelihood highlights the overall goals of the RIWAH-project.



## 8. Conclusion

The RIWAH project aims to reduce climate change-related water shortages among smallholder farming households in climate-vulnerable districts by promoting the testing and establishment of water harvesting technologies in Uganda and Tanzania. This report has presented the findings from the first two rounds of data collections in August and November 2025 among Farmer Family Learning Groups (FFLG) and individual households across five districts in Tanzania and Uganda.

The results indicate positive progress in the adoption of water harvesting technologies. By November 2025, 34% of households reported harvesting rainwater as their main current water source, compared with 14% in August. At the same time, 94% of the surveyed households reported having implemented at least one WHT, and the average number of implemented technologies per household increased from 1.7 to 2.7, indicating that, on average, households have adopted one additional technology from August to November. These findings show that WHTs are not only being tested within the FFLGs but are also taken up at household level. Contour bunds and mulching remain the most widely implemented technologies, although these methods are also introduced through the ESFROMA project, and therefore not solely can be attributed to RIWAH. Beyond these, adoption of spate irrigation, planting pits and roof top harvesting increased across districts, suggesting that these technologies may be worth attention in the future promoting efforts.

Due to several methodological limitations, this report cannot establish a causal relationship between WHT implementation and improvements in food security. Seasonal factors and other external influences are likely to affect the observed changes in the short time-period from August to November. Nevertheless, developments in household food security are encouraging. The share of households consuming three meals per day increased from 57% in August to 78% in November, and the average HDDS rose from 5.9 to 7.1 over the same period. Even though these improvements cannot be directly attributed to RIWAH, they indicate positive trends which correspond to the overall purpose of the project.

At the same time, several challenges remain. The most prominent issue is the limited water availability over longer periods. Many households still report unreliable rainfall, droughts and climate uncertainties. In addition, households report on lack of water storage infrastructure as a continues limitation.



The main takeaways for the continued implementation of RIWAH are twofold. First, expanding water harvesting technologies through learning activities to even more farmer groups remain essential. Particularly through FFLGs rotational visits, which was highlighted by respondents as key. To support this approach a continuous work to increase engagement from local governments will be important. Second, lowering costs is essential. Groups report on positive experiences with collective purchases of materials and shared rotational labor. Continued focus on cost-effective solutions is necessary to ensure that both establishing and maintaining the technologies remain available for smallholder farmers for longer terms.

In conclusion, the findings from the RIWAH project demonstrate early and continuous progress toward climate-resilient water management among participating smallholder farmers. While this report focuses on descriptive results and trends, the findings suggest potential for improvements in water resilience and food security across the districts. When additional data becomes available over time, future reports will be able to evaluate on more long-term outcomes and better understand RIWAH's contribution to sustained climate resilience. The project holds significant potential to further improve food and water security and the livelihoods in the participating districts.