

2025 second season food security and socioeconomic performance of farming households in
Mayuge District, Uganda

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ABSTRACT

This study examined the food security status, socioeconomic characteristics, and agricultural performance of farming households in Mayuge District, Uganda, during the second agricultural season of 2025 (2025B). Using a descriptive research design, data were collected through telephone-based interviews conducted between February and March 2026. A total of 206 farmers were interviewed from an initially targeted sample of 240, drawn from a population of 3,400 farmers involved in various government-supported agricultural programs, including the National Oil Seeds Project (NOSP).

The analysis focused on demographic characteristics, landholding sizes, crop production patterns, livestock ownership, farmer institutional participation, food security status, dietary diversity, drinking water consumption behavior, financial status, and prevailing agricultural constraints. Descriptive statistics, including pivot tables, correlations, and histograms, were applied using MS Excel.

Findings indicate that 51% of households were food secure, while 49% remained food insecure based on self-assessment questionnaire. This marginal balance reflects vulnerability driven by limited access to production resources, low education levels, large household sizes (averaging 8 persons), and unreliable rainfall patterns. Landholding sizes averaged 1.97 acres, suggesting increasing land fragmentation. Crop production was dominated by maize, beans, and cassava, with declining cultivation of nutrient-rich crops such as sweet potatoes.

A notable concern is the expansion of sugarcane cultivation (reported at approximately 28–43%), which is displacing food crop production and exacerbating food insecurity. Dietary diversity remains low, with most households consuming fewer than recommended food groups. Additionally, human water consumption levels were below recommended standards, potentially contributing to health challenges.

The study also found low levels of farmer organization, with only 29.6% participating in collective initiatives. Financial vulnerability is high, with 64% of households reporting indebtedness, mainly for agricultural investment and education expenses. Environmental constraints—particularly pests, diseases, and erratic weather—were the most significant factors affecting agricultural productivity.

Health outcomes present a critical dimension, with 97.5% of households reporting at least one sick member and a high prevalence of non-communicable diseases such as chronic respiratory diseases, hypertension, and diabetes. Social challenges, including theft and gender-based violence, further undermine agricultural productivity and household welfare.

The study concludes that food security in Mayuge District is influenced by an interplay of agricultural, socioeconomic, health, and institutional factors. Strengthening extension services, promoting crop diversification, improving access to credit, and regulating land use for sugarcane cultivation are essential interventions for enhancing household food security and resilience.

Key words: food security, nutrition, non-communicable diseases, telephone survey.

Introduction

Food security exists when all people at all times have physical, social and economic access to sufficient, safe and nutritious food for health and active life (FAO, 2024). Smallholder farmers' farming systems are diverse in nature and cultural in practice. The farming is mainly rainfed and seasonal in nature because of the bimodal rainfall patterns (Geda A, Yimer A, Demissie T, Radeny M, Kassie G, Tesfaye A, Belay B, Solomon D., 2023). This farming system presents several constraints that ultimately impact negatively on the crop performance. Smallholder farmers always struggle to secure their families against food shortages across the year (Siiba A *et al.*, 2024). This is because food security as defined by FAO, is determined by a number of resources which unfortunately are in limited quantities for most households. This problematic situation is exacerbated in most of such smallholder families by having large family sizes especially in Africa (John Bongaarts, 2020) and Uganda in particular (Matovu *et al.* 2017; Ntozi & Ahimbisibwe, 2001). This agricultural statistics survey was thus commissioned to determine the state of food security among smallholder households in Mayuge district in 2nd season of 2025. In addition, the survey aimed finding out the state and performance of the sugarcane enterprise involvement among households in Mayuge district. It also tried to measure the level of adoption of cooperative farming as a farmers' strategy to ameliorate common constraints to profit oriented farming. The rest of this report is arranged in the following sections; study design, results, discussion of results and conclusion and recommendations.

Survey design

A descriptive research design was adopted for this study using a survey conducted during February 2026 & March 2026. The study, which assessed the respondents' situation between July 2025 to December 2025, aimed at creating a basis for agricultural development decision making in the district. The survey adopted telephone interviews among the previously selected respondents from lower local governments using computerized random number assignment. The farmer contacts had been obtained from records of previous and ongoing government projects including National Oil Seeds Project (NOSP), Parish Development Model (PDM), Micro scale Irrigation Project (MSIP), National Oil Palm Project (NOPP) and Parish Development Model. But the final list of respondents was randomly selected using MS Excel program' random number function attached to all potential participants in the survey. The participants' names to which random numbers had been assigned were rearranged using random numbers from least to the largest number. The questionnaires were configured into an MS Excel sheet in which the interviewer would call a respondent, introduce him/herself, seek their consent, and engage them in a 25 to 30 minutes interview.

Sample size

While the importance of this exercise is overwhelming, the study population was 3,400 farmers from which the sample population was 240 farmers with reference to table 1 (Glenn Israel, 1992). However due to limited funding, a decision was taken to interview 206 out of the targeted 240 farmers. And further, due to several questions set to assess the seasonal performance, differences in actual respondents varied depending on a variety of factors surrounding the survey execution.

Data quality and rigour

Several measures were put in place to ensure data quality and rigour. A previously used structured questionnaire from ministry of Agriculture, Animal Industry and Fisheries was adopted with modifications to suit appropriateness, and relevance to the study objectives. To support reliability, data collection procedures were standardized, and interviews conducted in the respondents' preferred local language and English in case the local language for respondents whose local language could not be spoken and understood by the interviewer. Validity was reinforced through careful selection of participants who were willing to respond to questions and were residents in Mayuge district.

Data analysis

Data were analyzed in MS Excel using descriptive statistics with help of pivot table, bivariate regressions and correlation analysis.

Survey results and discussions

Response rate:

The response of the target farmers in the entire district was 60% due to several factors and it varied greatly according to respondents' gender as in table 1 but with a slight improvement of up to 87% among NOSP implementing sub counties (image 1).

Table 1: Mayuge District farmers' responses to phone calls, April 2026

Farmers attitudes towards telephone-based interviews, 2025B agricultural performance		
Nature of response by gender	frequency	Cum. frequency
Female declined calls	6	6
Female accepted calls	54	60
Male declined calls	19	79
Male accepted calls	70	149
Non-recorded responses	57	206

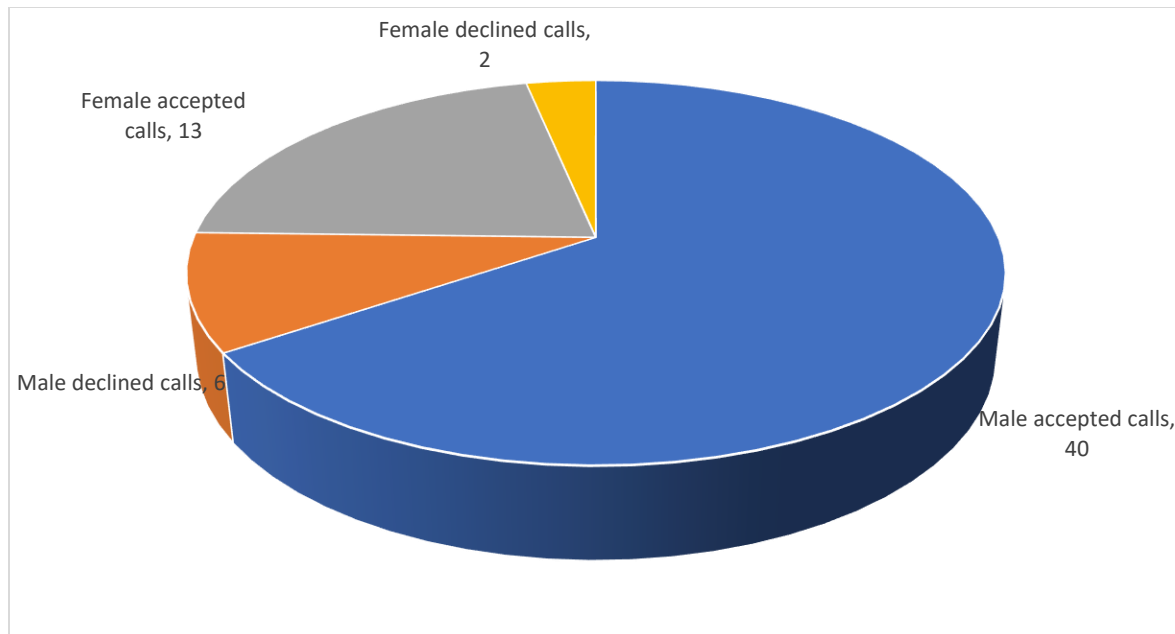


Image 1: Nature of NOSP implementing sub counties' respondents, April 2026

For declined calls, declined stands for conditions like subscriber was not available, the number was switched off at the time of call, call went through but subscriber never responded, and the number does not exist on the network. Azad A. *et al.* (2021) while conducting In-Depth Interviews via Mobile Phone with Persons with Common Mental Disorders and multimorbidity explored participants' and researchers' views about phone interviews and observed that loss of human encounter, need for intense listening, concern about technology (connectivity), and environmental disturbances (noise) were key challenges with this type of interviews. However, Unnithan, M. (2020) argues that telephone interviews are a "second-best" method, but only feasible under certain conditions. Therefore, within the limited budgetary and other conditions under district services, this approach to collecting the highly needed agricultural statistics data, the telephone interviews serve some purpose.

Respondents' demographic characteristics

Age of respondents:

For this characteristic, 138 respondents answered this question and their mean age was 50 years with the oldest farmer being 70 and the youngest being 30 years. This could be attributed to the large part of the sample population drawn from farmers that had previously expressed interest in oil palm growing, an enterprise that requires having a reasonable amount of farm land that may not be possible for young farmers. In their research, Danso-Abbeam et al. (2022) while studying the welfare of perennial crops farmers in Ghana, results revealed the average farmers' age was 50 years and further showed that the more the number of male adults in the households the higher likelihood of involvement in perennial crops farming. Given the higher number of male respondents who positively responded to the questions, this respondents' mean age is acceptable because the temporal difference between 2025A and 2025B seasons is minimal.

Gender of respondents

At district level, out of the 157 fruitful responses to the survey questions, only 38 were females leaving the balance of 119 males representing 76% male respondents. Within NOSP sub counties, only 3 were females & 60 males. The larger number of male farmers involved in this survey could still be attributed to several reasons including but not limited to; males are more financially stable and could have stable access to phone calls than women. Additionally, female farmers tend to be restricted by male spouses to receive phone calls from strange callers. Further, not many females own land and were unlikely to be selected for this survey since the respondents were mainly drawn from potential oil palm and other commercial crops growers. Finally, female farmers tend to be engaged with home-based gender roles which at times do not allow them to have their phones nearby which might have resulted into some of the calls unattended to.

However, this ratio of female to male participation in this survey is not unique given that majority of the respondents were cash crops farmers which permanent land ownership unfortunately is disadvantageous to the females. A slightly less participant ratio was obtained in Ghana by Hashmiu *et al.* (2022) in their study of cash crops and food security among households in dominant cocoa and cashew nuts growing regions.

Marital status

Out of the 137 district-based respondents, 89% were married, 7% were not married and 4% had separated from their spouses.

Education status of respondents

From figure 1, the status of education of respondents who participated in the 2025B seasonal performance assessment. From the graph, slightly over 44% of the respondents attained ordinary level education but still approximately 20% ended in primary education. These statistics still presents a problematic situation in terms of effective agricultural technology implementation. This is because most of the basic training about modern agricultural practices within Uganda's educational institutional framework are offered at higher educational levels. Additionally, majority of the farm inputs which farmers use or require for proper agricultural production have manuals or instructions inscribed in English, which calls for more efforts to invest in population education.

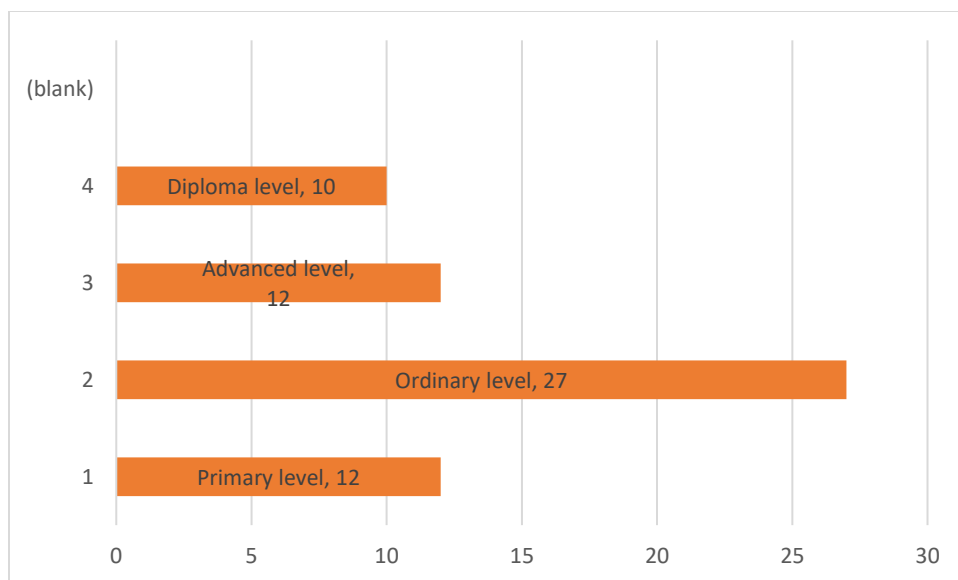


Figure 1: Education status of 2025B Mayuge farming households in NOSP sub counties

Respondents' main occupation

From the survey, most people in NOSP sub counties were involved in farming with a wide variance as farmers' education status increases (table 3). Most respondents reported to have carried out primary production comprising of crop farming and some fishing.

Table 2: Main occupation with respect to their education status by end of 2025B agricultural season

Highest education attained	Count	Main occupation	Count
Primary level	12		12
		Farming	9
		Other	3
O-level	27		27
		Farming	23
		Fishing	2
		Formal employment	1
		Other	1
A-level	12		12
		Farming	10
		Formal employment	2
Diploma level	10		10
		Farming	7
		Formal employment	3
Grand Total			61

The statistics still revealed that formal employees are not actively involved in farming, but this could still be attributed to very minimal number of members of the public in the formal sector among the NOSP sub counties in Mayuge District. Further, the survey indicated that no degree

graduates are involved in the crop value chains activities. This is because this survey probed respondents' involvement the crop value chain activities except restaurant services as well as facilitating functions like bodaboda, Mayuge being a rural based district. These statistics corroborates with the findings by Jjuuko R. (2021), MAAIF (2019), & Gemma Ahaibwe *et. al.* (2014) which indicate that young graduates are not absorbed into agriculture in preference for other jobs. These results still show that Mayuge district is primarily an agrarian district with 80% of the respondents deriving their livelihoods directly from farming. These results to some extent corroborate with the 2024 national population and housing census (UBOS, 2024) which revealed that approximately 75% of Ugandans are involved in subsistence farming.

Land holding status in the district

In this same season, the plot size distribution to the biggest garden in the surveyed households is tabulated in table 3.

Table 3: Land plot size distribution per household, 2025B

Total plots size (Acres)	District level frequency	NOSP sub counties frequency
0.5	5	4
1	61	21
2	42	25
3	15	5
4	3	2
8	7	3
Grand Total	133	60
Average land size = 1.97 acres		

In 2025A, we surveyed 175 farmers in this district, and results indicated that approximately 28% of the respondents had between 1 -2 acres per household. This is an indicator of land fragmentation given the current population. The current findings still paint a similar trend of household land ownership by size.

Main crops grown

From the survey, the responses showed that the major annual crops grown especially in NOSP implementing sub counties over the season were maize, beans, soybeans, groundnuts, vegetables and cassava as exhibited in table 4 & 5.

Table 4: The position of soybeans & groundnuts farming among other annual crops in NOSP sub counties, 2025B

Sub county & (sample)	Frequency
Kityerera (14)	Maize=10, beans=4, gnuts=6, soybeans=0, vegetables =2, cassava =1, s/potatoes =0, other =0
Malongo (28)	Maize=14, beans=6, gnuts=4, soybeans=2, vegetables =10, cassava =5, s/potatoes =0, other =0

Kigandalo (8)	Maize=6, beans=4, gnuts=3, soybeans=1, vegetables =1, cassava =4, s/potatoes =0, other =0
Bukabooli (3)	Maize=2, beans=2, gnuts=2, soybeans=0, vegetables =0, cassava =0, s/potatoes =0, other =0
Bukatube (9)	Maize=5, beans=1, gnuts=1, soybeans=1, vegetables =3, cassava =1, s/potatoes =0, other =0

All sub counties indicated to have planted NOSP crops which shows that farmers have embraced the project although the results call for more efforts in mobilizing more households to adopt these value chains. Traditionally, Busoga region used to be known for serving sweet potatoes and gnuts meals (The Monitor, 2021), but again the results are showing that our farmers are abandoning sweet potato farming (table 5) yet sweet potatoes are important sources of vitamins and minerals necessary for normal health. These results are similar to the 2019 Annual Agricultural Survey (UBOS, 2020) findings which indicated that over 50% of the households surveyed grew mainly maize and beans. The ranking seems to indicate that Mayuge farmers are not actively growing protective foods, and this exposes them to a higher risk of contracting life-style diseases. Similar findings were obtained by Beliyou Haile et. al (2021) in a study about protective foods in East Africa.

Table 5: District level annual crops cultivation status in 2025 second season

Crop type	Count of annual crops
Maize	28
Beans	4
Groundnuts	10
Soybeans	6
Vegetables	16
Other	3
Maize & beans	24
Maize, beans & groundnuts	8
Maize, beans & cassava	4
Maize, groundnuts & cassava	3
Maize & vegetables	9
Maize & cassava	4
Beans, vegetables & cassava	1
Beans & cassava	3
Groundnuts & soybeans	8
Vegetables & cassava	1
Grand Total	132

Major livestock kept by smallholder farming households

During the same survey, we interrogated households to establish the main livestock kept by farmers and the core purpose for keeping them. The summary of the findings to this effect is depicted in figure 2. The findings show poultry is the dominant livestock kept and it serves dual purposes of food and sale to contribute to the households' livelihood. This is followed by cattle and goats rearing respectively for almost the same purposes.

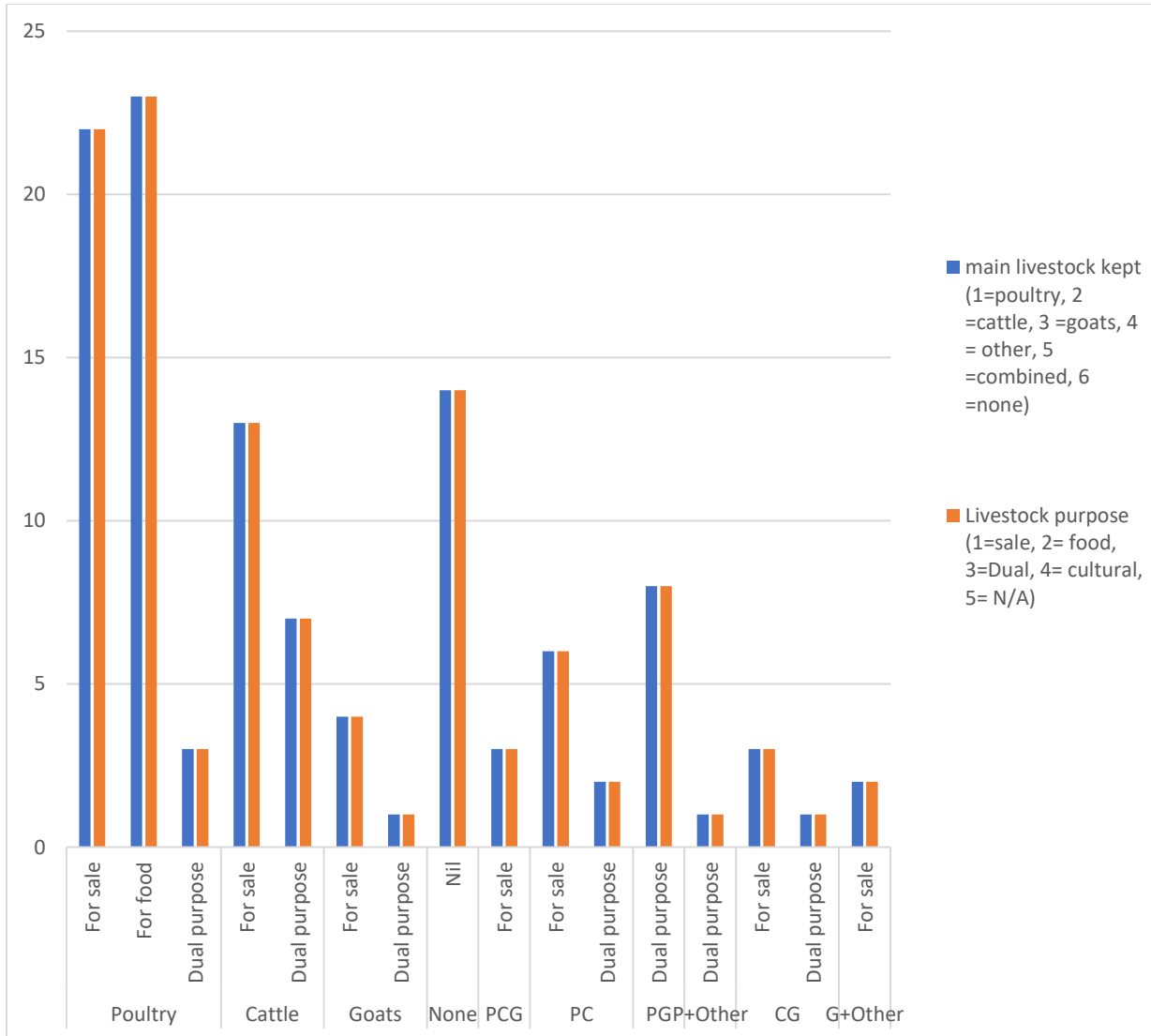


Figure 2: Type and purpose of livestock kept during second season of 2025

PC - stands for combined poultry and cattle, PCG – stands for combined poultry, cattle and goats in a household. CG is for cattle and goats.

Farmer institution development status

From the survey, out of the 135 farmers who responded and fully interviewed, only 29.6% of them reported belonging to some form of togetherness for development while the majority are largely uncooperative (table 6). Even those that are struggling to work together, they are doing so at village level, which shows that stakeholders and some projects have not deliberately guided the community to aim higher if we are to cause significant change. This indicates that only one-third of farming community members increasingly realized the need for cooperation to solve most of the constraints to collective marketing.

Table 6: Status of farmer cooperation for development by end of 2025B season

Membership to collective initiatives	Collective type	Frequency	Percentage
Belongs to collective effort		40	29.6
1	Village farmer group	31	22.94
2	Farmer cooperative	3	2.22
4	SACCO	4	2.96
6	Others	2	1.48
Not cooperative		95	70.4
Individual			
Grand Total		135	100

Despite the above effort, the majority of the farmers have not exhibited need to work together as illustrated in tables 6 & 7. Pamela Jagger (2017) discusses factors influencing farmers collective action and points out that recognition of common property is the main driver. This implies that most of our farmers have not acknowledged that most of these projects with farmer group approaches are the common property hence weak collective action to benefit from them. Such situations emanate from several factors like weak institutional support notwithstanding as Alexander M. Kaminski *et. al.* (2020) highlight in their findings on aquaculture studies. But Vesall Nourani *et. al.* (2021) point out that democratically run groups compared to leader-managed groups to be much better cooperative. This calls for a strong effort to ensure that existing farmer groups in whatever forms are exercising indicators of the democratic principle of cooperatives.

Table 7: State of cooperation for collective marketing among NOSP communities by end of 2025B season

Cooperation behavior	Collective marketing initiative type	Number	Percent
Cooperative farmers	Cooperative farmers	27	44.3
	Village Farmer Groups	19	
	Farmer cooperatives	1	
	SACCO	3	
	Other initiatives	4	
Uncooperative farmers	Individuals	34	55.7
Grand Total		61	100

Stakeholders in commerce and community development ought to do more to help create a bright image that can entice the 70% farmers to join or form their collective initiatives and benefit from NOSP and other projects. Our results nevertheless, show a slight improvement in collective efforts (44.3%) within the NOSP participating sub counties (table 6). This could be attributed to a more focused effort by the NOSP implementing team to create more awareness about the project benefits of collective action when rural farmers accept to team up into small farmer groups and farmer cooperatives.

Food security & nutrition status among farming communities

During the same survey, we observed that Bukabooli and Kityerera sub counties among NOSP implementing sub counties were in a crisis phase of the integrated Phase classification of food security following the FAO. But most of the households in Kigandalo, Malongo and Bukatube sub counties were in normal phase characterized by minimal food insecurity (table 8). This insecurity is perhaps caused by several factors which include large family sizes and limited production of protective food crops. The average household size of Mayuge farming households by end of December 2025 was 9 persons per household. This family size is by far higher than the national average which stands at 4.4 (UBOS, 2024).

Table 8: Self-assessment status of household food security between July & December 2025 among NOSP Sub Counties

Sub county	Food secure population proportion	Food insecure proportion	Food security Phase under IPC	
Bukatube (9)	100%	0%	Phase 1	Normal
Bukabooli (3)	66%	33%	Phase 3	Crisis
Kigandalo (8)	100%	0%	Phase 1	Normal
Kityerera (7)	57%	43%	Phase 3	Crisis
Malongo (23)	91%	9%	Phase 1	Normal

Further analysis of NOSP sub counties revealed that 61% of the households had 4 meals per day and the rest had less meals with 12.2% having one meal a day. This is against 45% of households that had 4 meals per day and 10% having one meal a day in the entire district sample. In terms of dietary diversity, majority of the interviewed respondent households ate less than average foods from the recommended food groups with many of them eating them only twice a week (table 9) contrary to the ideal of at least 2 to 3 daily servings for pulses & nuts (MAAIF, 2020).

Table 9: Status of household dietary diversity score within NOSP sub counties during 2025B

Cereals & tubers	Pulses & nuts	Milk & dairy products	Red meat	Fish, pork, chicken, rabbits	Vege & leaves	Oils and fats, spices	Fruits-any type - avocado, pineapple, jackfruits, w-melon, mangoes, empafu	Sugar & sweets	Matooke & ripe bananas
4	3	2	2	2	4	5	4	5	2

NB: These scores are for a seven-day period.

Source and status of households' drinking water

Part of proper feeding behavior is that persons should drink water regularly at an average of 2 litres per day (MAAIF, 2020) but more precisely at 20 ml per kilogram of their body weight and generally 2.5 to 3.5 litres per day (Erica T. Perrier et al., 2020). This survey found that the water drinking culture of Mayuge community adults stood as in table 10 based on 47 respondents who answered questions on drinking water.

Table 10: Water drinking habits of Mayuge households, 2025B cropping season.

Est. of water drunk per day (1=0.5L, 2 =1L, 3= 1.5L, 4 =Not sure)	Source of drinking water (1=borehole, 2 =spring well, 3 =shadoof, 4= tap, 5 =other)	Numbers by water consumption Source: (1=borehole, 2 =spring well, 3 =shadoof, 4= tap, 5 =other)
1		2
	1	2
2		23
	1	11
	2	1
	4	10
	5	1
3		20
	1	15
	4	5
4		2
	1	2
Grand Total		47

From the analysis, majority of the population drink less than the recommended volumes of water which could be a contributor to high levels of hypertension (Waluube P., 2025). Additionally, while literature indicates that spring water is one of the purest forms of water (Pardomuan Robinson Sihombing, 2025), only one out of the 47 respondents reported using spring well as their source of drinking water. The fewer number of households accessing spring water could be a result of ongoing destruction of natural ecosystems like hills and mountains in the district for other development activities.

State of financial freedom

By the end of the same period 2nd season 2025, generally 2 in every 3 households were indebted. In other words, 64% had borrowed funds from lending institutions for a certain reason (figure 2).

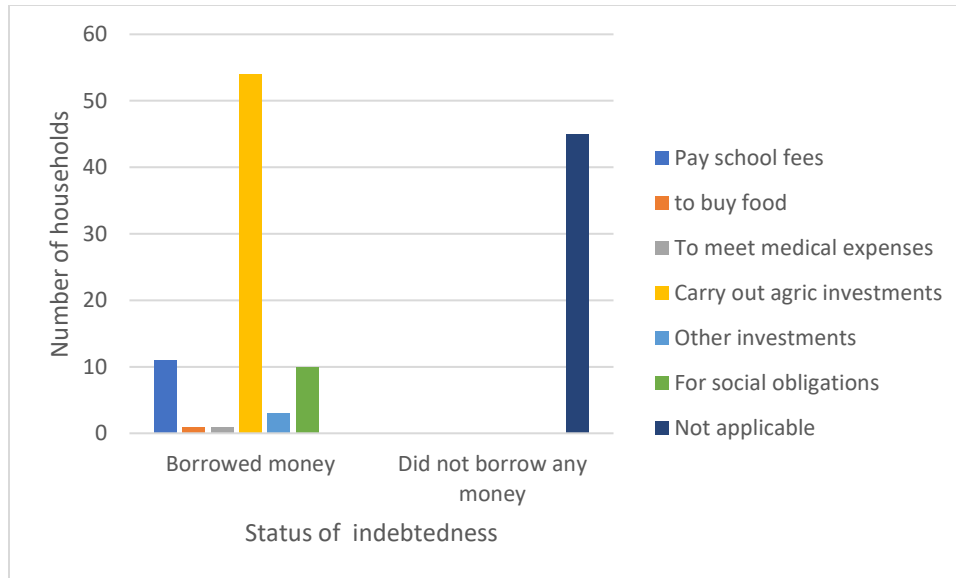


Figure 3: State of indebtedness of Mayuge households during 2nd season 2025

The results showed that a higher number of households borrowed to invest in agricultural development followed by struggles for meeting children’s school fees. This is quite a good strategy because it ultimately contributes positively to the food security situation by the end of the season. However, borrowing to educate children although not surprising since the cost of education children has been rising according to National Education Accounts 2016 report of the Ministry of Education & Sports as cited by Nabiddo W. *et al.* (2023), it places farming households under stress in the process of worrying of repayment conditions.

Status of commercial sugarcane farming in Mayuge district

In terms of general sugarcane growing in the district, each respondent was asked to report about sugarcane growing among their immediate 10 neighboring households. The results of this probe revealed that 2 out of every 10 households grew sugarcanes as per the 2025B farming season. However, the respondents’ self-reports revealed that sugarcane growing in the entire district stood at approximately 28% coverage. Sugarcane growing threatens household food security if a household having 8 to 10 acres in total reserves less than two acres for food production according to a 2024 policy note of the Economic Policy Research Centre. Therefore, there is need to continue investigating the sugarcane value chain dynamics within the district to come up with a better position on which to guide the community about sugarcane growing vis-à-vis household food security.

Bottlenecks that characterize the 2025B seasonal agricultural sector performance

Figure 4 and table 11 show the summary of constraints which affected farmers’ crop enterprises in NOSP sub counties at farm and marketing level. From the survey, the results still show that weather related changes and pests & diseases were the main constraints experienced by farmers in the season. This was followed by inadequate capital needed to effectively manage the crop enterprises. Similar trends were observed in 2025A (Waluube P., 2025; Nakyagaba *et al.*, 2025)

with pests & diseases having been the number one constraint followed by unpredictable weather. Related findings are reported by Ilukor J. *et al.* (2025) in which unreliable rainfall and groundnut rosette disease were reported to affect groundnut farmers in groundnuts farming areas. These results call for extension services to strengthen advisory roles with respect to timely planting, short maturing crop varieties and continuous linkage of farmers to input stockists for supply of and advice on proper pesticides.

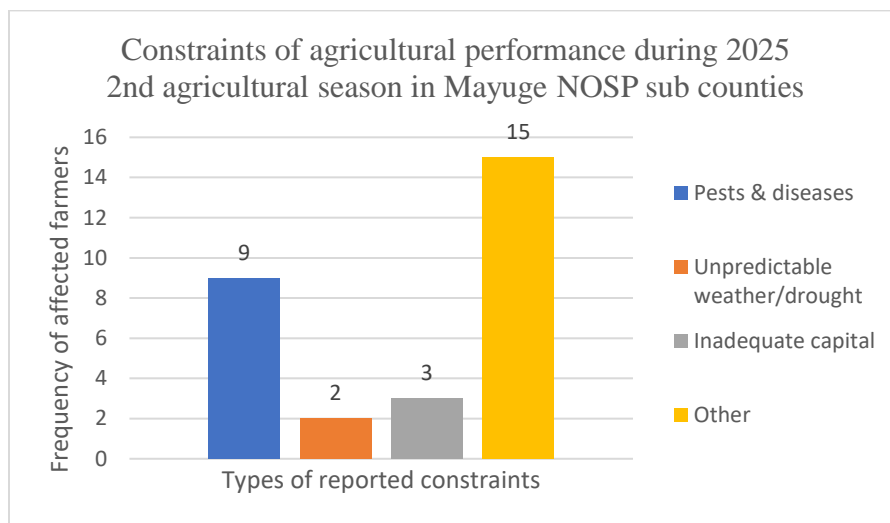


Figure 4: Environmental factors that influenced the 2025B agricultural performance

With regard to inadequate capital, the community development extensionists should strengthen farmer institutional capacity building training so that this constraint can be ameliorated through farmers collective efforts.

Table 11: Social constraints affecting farmers in NOSP sub counties during 2025B cropping season

Types of social constraints	Frequency of report	Percentage
Theft	20	34
Gender based violence (GBV)	6	10
Land wrangles	3	5
other issues	12	20
Fisher arrests	2	3
Theft & GBV	4	7
Theft, GBV & land wrangles	1	2
Theft & land wrangles	6	10
GBV plus land wrangles	1	2
Land wrangles & other challenges	1	2
GBV plus other issues	3	5
Grand Total	59	100

During the 2025B cropping season, farmers also reported property (including produce) theft by undisciplined members of the society as a major social disorder. This was followed by gender-based violence and other social issues (table 11). Although there is less researched literature on causes of theft in rural farming communities, this could be an indicator of ongoing food insecurity among several households which are exacerbated by population pressure on the existing arable land. The high GBV prevalence results are also signal to weak social mechanisms at household level still linked to poverty issues which impact negatively on the implementation of NOSP activities resulting low outputs at farm level. Awor P. et al. (2025) report that less educated rural women are more likely to experience sexual and physical violence than men. Additionally, their results show that where the husbands are involved in domestic work with their wives, there is less sexual violence with prevalence ratio (PR=0.84; 95% CI 0.78 to 0.90) and physical violence (PR=0.83; 95% CI 0.76 to 0.91). Our survey did not probe deeper to differentiate which type violence was prevalent and which gender was most affected, however, given the customary nature of land ownership coupled with cultural norms, women are likely to be much affected in this context.

Health statuses of the respondent households

Out of the 51 households who fully responded to our household health related questions during 2025 second season, 97.5% of them had at least 1 sick member suffering from malaria and noncommunicable diseases (table 12) while only 2.5% households reported normal health. This implies that majority households could not fully concentrate on farming activities and this largely explains why the farming performance is in an appalling state.

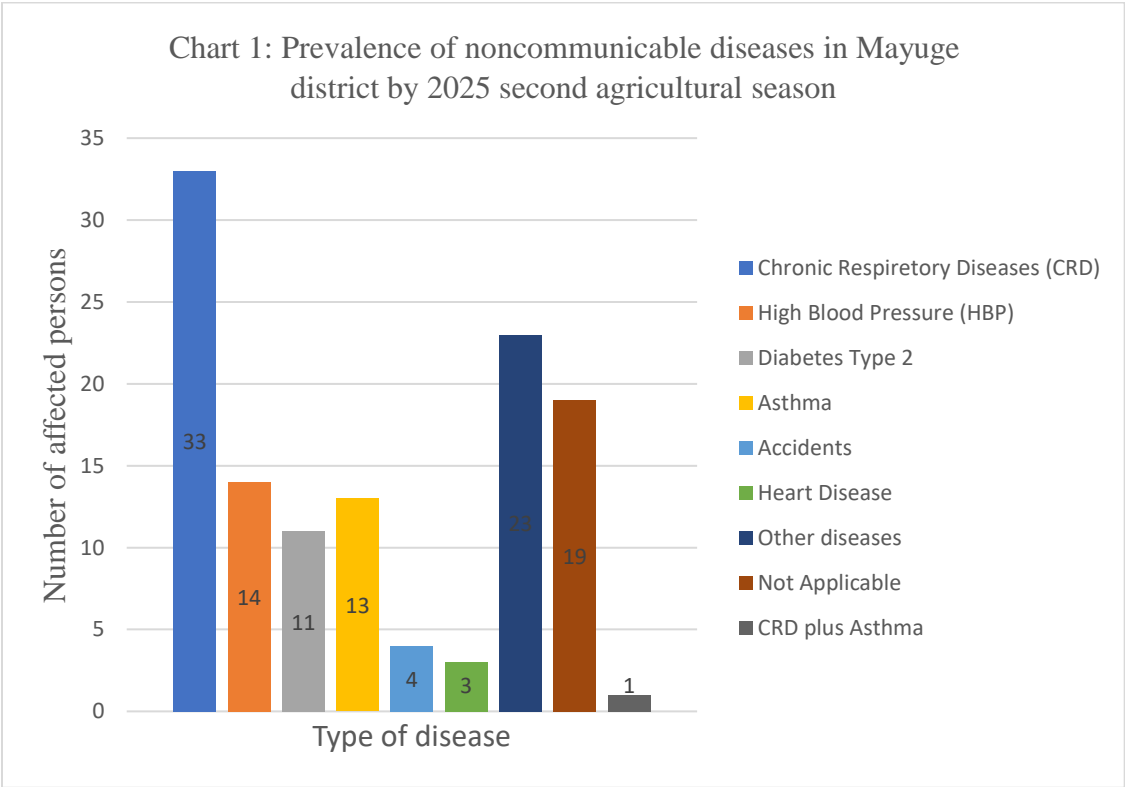
Table 12: Status of noncommunicable diseases among farming communities in Mayuge district by December 2025

Average monthly medical expenses	NCD type	Count of NCD	Source of treatment/care	Count of patients by source of treatment/care
≤100,000		51		51
		41	Mayuge HC IV	41
	CRD	21		21
	HBP	4		4
	Asthma	5		5
	Heart disease	1		1
	Other	10		10
		4		Mayuge HC IIs
	Other	4	4	
		1	Referral Hospital outside Mayuge	1
	Other	1		1
		4	Nonconventional centre	4
	Other	4		4

		1	Never sought health centre treatment	1
	HBP	1		1
101,000≤300,000		54		54
		36	Mayuge HC IV	36
	CRD	10		10
	HBP	6		6
	DT2	11		11
	Accident	4		4
	Other	4		4
	CRD & asthma	1		1
		4		Mayuge HC IIs
	Asthma	4	4	
		2	Referral Hospital outside Mayuge	2
	Other	2		2
		4	Nonconventional centre	4
	HBP	2		2
	Heart disease	2		2
		8	Combined sources	8
HBP	1	1		
Other	7	7		
301,000≤500,000		11		11
		6	Mayuge HC IV	6
	Other	6		6
		5	Referral Hospital	5
	Asthma	5		5
Grand Total		116		116

In terms of the types of non-communicable diseases, a deeper probe showed different households suffering from several diseases as tabulated in table 12. As can quickly be visualized in chart 1, chronic respiratory diseases, hypertension, DT2 (Diabetes Type 2) and asthma are the leading noncommunicable diseases among the survey participants. This prevalence of these diseases among the farming households calls for a concerted effort by extension workers to incorporate food & nutrition trainings to their target trainees in their routine service delivery. The ministry of agriculture, animal industry & fisheries (MAAIF) highlights most of these diseases as some of the noncommunicable diseases that can be controlled through modification of the risk factors including changes in the food diet (MAAIF, 2020). Further, the current burden of noncommunicable diseases in Uganda is said to be at 33% prevalence (Kraef C, *et al.*, 2020) and

the financial burden associated with managing these diseases is unbearable by most rural households as the out-of-pocket claim is approximately 36% (Adelakun Odunyemi et al., 2024) of the total household budgets.



Conclusion and application of findings

The findings of this study clearly establish that Mayuge District remains predominantly agrarian, with the majority of households relying directly on smallholder farming systems for their livelihoods. Despite this strong agricultural foundation, the district faces persistent structural and systemic challenges that continue to undermine food security, nutrition, and overall socioeconomic development.

A central observation is the precarious balance between food security and food insecurity, with nearly equal proportions of households falling into each category. While favorable rainfall conditions during the 2025B season contributed to modest improvements in food availability, this progress is fragile and highly susceptible to climatic variability. The continued dependence on rain-fed agriculture exposes farmers to significant production risks, particularly in the context of increasingly unpredictable weather patterns.

Land fragmentation, as evidenced by the average holding size of approximately 1.97 acres, further constrains productivity and limits the potential for commercialization. Small land sizes restrict crop diversification and reduce the capacity of households to generate surplus for market participation. This situation is compounded by the expansion of sugarcane cultivation, which,

although economically attractive, is increasingly displacing food crops. The growing dominance of sugarcane presents a structural threat to household food security by reducing land allocated to nutrient-rich and staple food production.

The study also highlights critical gaps in human capital development. The relatively low levels of education among farmers limit their ability to adopt improved agricultural technologies and practices effectively. This challenge is further exacerbated by weak extension service penetration and limited access to timely and appropriate agronomic information. As a result, farmers remain vulnerable to pests, diseases, and suboptimal production practices.

Institutional weaknesses are another major constraint. The low level of farmer participation in collective organizations significantly undermines opportunities for collective marketing, input acquisition, and knowledge sharing. The predominance of individualistic farming approaches reduces bargaining power and limits economies of scale. Strengthening farmer cooperatives and promoting inclusive, well-governed group structures will be critical for enhancing agricultural productivity and market integration within NOSP and other projects.

The intersection between agriculture, nutrition, and health emerges as a particularly critical issue. Poor dietary diversity, inadequate water consumption, and the high prevalence of non-communicable diseases collectively point to a broader public health challenge within farming communities. The finding that nearly all households reported at least one sick member underscores the extent to which health constraints directly impact agricultural labor productivity and household resilience. The poor dietary diversity also revealed less consumption of pulses and nuts which NOSP seeks to amplify in multiple forms.

Financial vulnerability further compounds these challenges. High levels of indebtedness indicate limited access to sustainable financing mechanisms and insufficient income generation. While borrowing for agricultural investment is a positive sign, the absence of structured and affordable credit systems exposes farmers to financial risk and potential cycles of poverty. Social factors, including theft and gender-based violence, also play a destabilizing role. These issues not only affect household welfare but also disrupt agricultural activities and weaken community cohesion. Addressing these challenges requires integrated interventions that go beyond agriculture to include social protection and community development strategies.

In light of these findings, a multifaceted policy response is necessary. Priority should be given to promoting crop diversification, particularly nutrient-dense food crops like soybeans, gnuts and cocoa among others. Regulating sugarcane expansion in relation to household landholding capacity, strengthening agricultural extension systems with a focus on climate-smart practices and enhancing access to affordable credit through innovative models such as social collateral should be prioritized. Community workers should also help farmers to build strong, democratic farmer institutions to support collective action. Integrating nutrition and health education into agricultural programs particularly extension services to address social challenges through coordinated community-based interventions should be part of future strategies.

Ultimately, improving food security in Mayuge District requires a holistic approach that recognizes the interdependence of agriculture, health, education, and social systems.

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