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## High Value Crops and Their Role in Financing the Needs of Smallholder Farming Households in Central Uganda

**Abstract.** In Central Uganda, farmers are investing in high value crops, such as hot pepper (*Capsicum annum*), French beans (*Phaseolus spp.*), and okra (*Abelmoschus esculentus*) to meet household needs. Based on data from 273 adopters, this study identified priority household needs, assessed profitability of the crops, and evaluated the extent to which the crops address household objectives. School fees emerged as the foremost priority, followed by, among others, trade investment, liquidity, land acquisition, and healthcare. A gross margin analysis confirmed profitability, with French beans yielding the highest, (US\$ 1,003 ha<sup>-1</sup>), followed by hot pepper (US\$ 816 ha<sup>-1</sup>) and okra (US\$ 783 ha<sup>-1</sup>). Despite contributing about one-third of household income, production of these crops remains constrained by small land parcels (0.03–0.10 ha), high input costs, and limited advisory services, meaning only school fees were fully met. The findings highlight the need for interventions that strengthen market access, stabilise prices, and enhance productivity through irrigation, fertilisers, mechanisation, and improved varieties. Linking agricultural income to education financing is critical, while extension services, climate-smart practices, crop insurance, and public–private partnerships can reduce risks and improve access to inputs. Scaling up production and diversifying activities will enable households to meet a broader range of needs.

**Keywords:** priority household needs, high-value crops

**JEL Classification:** Q15, Q56

## Introduction

Development interventions must be consciously structured, planned and implemented with an aim of conferring the highest possible benefits to the target group in line with the intended development path (Belcher and Palenberg, 2018). This can be attained since economic growth is highly ranked among the farmers' objective set (Amir et al., 2020). Farmers in Central Uganda are increasingly embracing production of non-traditional horticultural export crops of High Value such as hot pepper (*Capsicum annum*), French beans (*Phaseolus spp.*), and okra (*Abelmoschus esculentus*), albeit slowly (Technoserve, 2024). Many studies have not adequately considered farmers' specific circumstances and priority

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objectives which are very crucial for the development of successful intervention programmes. Agricultural development programmes must take this into account (Diallo & Wouterse 2023).

As noted by Sibanda (1999), smallholder resource users are described as having objectives and decisions (Adolph et al., 2021) and therefore represent an organised decision-making unit. These activities are carried out with the purpose of satisfying the household needs as derived from objectives and priorities set. Farm-level operations are upheld as a typical objective-oriented system in which farmers' decisions must be understood in the prevailing environment and constraints.

This work is premised on the observation that in many economic-decision situations, households differ in their aspirations, choices and preferences (Mukerjee et al., 2023). Households are decision-making units (Hillesland & Doss, 2024, ;Chandrasa et al., 2021) whose objectives tend to form a hierarchical structure with food and nutritional security among the priorities (Kakaei, 2022). Households also venture into other livelihood objectives such as liquidity and profit assurance and asset accumulation. It follows that household economic portfolios are influenced by household needs. Farm and non-farm strategies undertaken by a household are shaped by several variables operating at different scales and levels in macro- and microeconomic environment.

The identification of farming objective(s) is a key decision affecting the choice of a farming strategy adopted by the respective households. Conceptually, resource allocation has some basic assumptions concerning the objective function of farmers. These assumptions include: (i) farmers have preferences revealed in utility functions; (ii) farmers' needs are many and conflict; (iii) the objectives are functions of the decision model variables; and (iv) the objective of production is to achieve satisfactory levels of income subject to limitations imposed by the environment. Household investment decision-making is a function of personality, household, regional and village factors. These include endowments of physical, human, social, financial and natural capital (Kefeng et al., 2021).

Following a decision to undertake farming activities, the choice of and number of crops, livestock, forestry enterprises and their combinations become important and influence household investment strategies. The inclusion of high-value crops is perceived from the costs and benefits involved (Murekezi et al., 2004). However, all farmers' objectives are not equally important, so the act of prioritising them helps indicate the choice preferences of a particular farmer. This paper discusses the priority problems that farmers strive to address by including the perceived HVCs in their production plans and assesses the extent to which the needs are achieved.

Sætra (2021) argues that human goals can be categorised. Firstly, there are those goals that relate to family, marriage, sex and romance. Second are interpersonal goals that are related to interactions with people in general, which are divided into subsets such as physical goals including health and appearance, and goals related to friendship, belonging, social recognition and social belonging. Other interpersonal goal subsets are related to receiving from others, avoiding rejection, general positive social qualities such as being honest, teaching and helping others, and leadership. The third main group of goals relates to intrapersonal issues which are also divided into subsets. One of these subsets contains values relating to freedom, ethics, social awareness and religion; another includes values relating to aesthetics, creativity, entertainment and openness to experience; another contains values relating to psychological well-being, safety and stability, personal growth, achievement and

self-determination; and another includes values relating to finances, career, education and intellect.

Objectives or needs, by implication, determine how farmers respond to any stimuli. Concern for the complexity and multiple nature of farmers' objectives dates back to the work of Ashby (1926). He asserted that: "... if we want to know how or why a farmer acts in a certain way or how to induce him to act in a certain way, we have to inquire especially why men act as they do when they live in the sort of social environment and general circumstances in which farmers live." However, the factors Ashby (1926) described as "motives" are more commonly treated by social psychologists as "values". To understand, therefore, why and how an individual acts in a certain way, his or her values must be explored. An understanding of these values, that is what is important to an individual, leads to an appreciation of the motives and rationale of the actions taken by that individual, i.e. their behaviour. In the literature on farmers' motives and their relationship with behaviour, the terms objectives, goals, needs and values are quite commonly used interchangeably (Ogbewi, 2021). The intrinsic nature of the value concept tends to be disregarded and the fact that objectives and goals have a means-end relationship in that "objectives set the goals, and strategy sets the path to the goals" is often obscure. In an attempt to address issues in this background, this study was designed with three objectives; (i) to identify the priority household needs that drive farmers in central Uganda to adopt High Value Crops (HVCs), (ii) to assess the profitability of the selected HVCs, and to evaluate the extent to which adoption of the HVCs enables farmers to meet their priority household needs.

## Methods

This study was conducted in the banana-coffee farming system that constitutes one of Uganda's farming systems (Mayanja et al., 2013). The study districts were: Luwero, Masaka, Mpigi, Mukono, Rakai and Wakiso<sup>5</sup> located in Central Uganda. It is in these districts that the study crops are mainly grown in Uganda (Masika et al., 2022), partly due to the high market access (Ddamulira et al., 2021) and conducive agroecological conditions in these districts. Multi-stage purposive sampling was used at the farming system and district levels using production figures of the crops under study. A total of 273 households that had adopted (and were growing) any of the three crops at least 3 years prior to the survey, were randomly selected (Table 1).

Both primary and secondary data were used in the study. Primary data were collected through administering structured pre-tested questionnaires in face-to-face interviews to cover farm activities and physical resources of the second season of 2018 (2018B), first season of 2019 (2019A) and the second season of 2019 (2019B). This quantitative approach was supplemented with qualitative approaches that included: community and key informant interviews and focus group discussions as well as observations made during village transect walks. Variables that were captured included; (i) socio-demographic variables (such as age, education, marital status of the household head); and (ii) variables related to the decision and choice of enterprise, and the costs and revenues of the study crops. Priority needs were

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<sup>5</sup> Luwero (0°50'N 32°30'E), Masaka (0°18'46"S 31°42'47"E), Mpigi (00°13'48"N 32°19'48"E), Mukono (0°21'12"N 32°45'19"E), Rakai (00°42'36"S 31°24'18"E) and Wakiso (00°23'53"N 32°28'41"E).

elicited by asking the respondents to rank what they seek to solve by growing any of the HVCs being studied, how much money they were to commit to achieving the needs, how much they had actually committed, and their opinions about the profitability of the crops. Although, the farmers provided several priority problems, only the top ranked eight that constituted the statistically accepted frequency was used for the analysis.

Table 1. Sample size by district and status of adoption of the HVCs

District	Respondents	Percent
Luwero	46	16.8
Masaka	41	15.0
Mpigi	37	13.6
Mukono	59	21.6
Rakai	48	17.6
Wakiso	42	15.4
<b>Total</b>	<b>273</b>	<b>100.0</b>

Source: survey data.

Secondary data were obtained from several official sources including publications, journals, Government reports and newsletters of the district. Most of the secondary information were also used to triangulate the primary data and discuss the findings. Data were analysed using MS Excel (windows 2013), SPSS (version PASW 18) and STATA (version 14) computer software. Analytical procedures included: estimation of frequencies, descriptive statistics, weighted averages and paired samples t-tests. Gross Margin Analysis was used to determine profitability (Saimon et al., 2016), and it was computed as follows (equation 1):

$$GM_i^s = Y_i^s P y_i^s - \sum_{x=1}^n VI_x^s P_x^s \dots\dots\dots (1)$$

Where:

GM is the gross margin (US\$ ha<sup>-1</sup>)<sup>6</sup> of the i<sup>th</sup> crop enterprise during the s<sup>th</sup> season;

Y<sub>i</sub><sup>s</sup> the production (Kgs ha<sup>-1</sup>) for the i<sup>th</sup> crop enterprise during the s<sup>th</sup> season,

P y<sub>i</sub><sup>s</sup> the market price (US\$ ha<sup>-1</sup>) of the i<sup>th</sup> crop produced in the s<sup>th</sup> season,

VI<sub>x</sub><sup>s</sup> refers to the quantity of variable inputs (units vary by nature of input, for example labour was in mandays, fertilisers were measured in kgs, liquid chemicals in litres) for the i<sup>th</sup> crop enterprise during the s<sup>th</sup> season,

P<sub>x</sub><sup>s</sup> is the unit cost of variable inputs (US\$ unit<sup>-1</sup>) for the i<sup>th</sup> crop enterprise during the s<sup>th</sup> season, i is an index for crop enterprises, and x the variable inputs. A weighted ranking approach, as used by Nakiganda *et al.* (2006), was employed.

The eight major household needs that drive farmers to adopt the study crops were captured. From the ranks, a total weight was calculated, and a weighted average was obtained as indicated in equation 2 below:

$$WAG_1 = (\Psi_{1,1} * \omega_8) + (\Psi_{1,2} * \omega_7) + (\Psi_{1,3} * \omega_6) + \dots\dots\dots (\Psi_{1,8} * \omega_1) / 8 \dots\dots (2)$$

<sup>6</sup> At the time of the study the Exchange rate between Ushs per US Dollar was.

Suppose the needs are arbitrarily labelled 1, 2, ....., 8 (not necessarily ordered), further: (i) Weighted averages for the needs (WAG) can be denoted by  $WAG_1, \dots, WAG_8$ ; (ii) Let the percentage of respondents that rank Objective 1 first be denoted  $\psi_{1,1}$ , that of those who rank it second, ....., eight be  $\psi_{1,2}, \dots, \psi_{1,8}$ ; (iii) Let the number of ranks for Objective 1 be denoted  $\omega_1, \omega_2, \dots, \omega_8$ . Then, the WAG values were ranked in ascending order.

The gross margins were compared pairwise (hot pepper vs French beans, hot pepper  $V_s$  okra and okra  $V_s$  French beans by seasons) and season-wise (2018B & 2019A, 2018B & 2019B and 2019A & 2019B by the HVCs) using paired t-tests samples. Finally, Analysis of Variance (ANOVA) was used to compare the “before” and “after” situations to ascertain whether farmers achieved their needs. The “before” period analysed the monetary value of needs (in Ushs) before producing the crops (beginning of season 2018B). These values were compared with the monetary values (in US\$) of what was actually spent on each of the aforementioned household needs “after” the study period (end of season 2019B). Data were analysed using Analysis of Variance (ANOVA).

## Results and Discussion

The socio-demographic and economic profile of the surveyed households ( $n = 273$ ) shows that household heads were relatively young, averaging 37.4 years, with 15.4 years of farming experience and 7.2 years of formal education (Table 2), which is higher than the national average of 6 years, and that of the Central region averages 7 years. Most households (61%) reported children enrolled in school (the national figure being 60 – 65% according to UBoS (2024), while 45% received remittances, reflecting the growing importance of non-farm income streams in rural Uganda (World Bank, 2022). Agricultural diversification was evident, with 30% cultivating bananas, 27% coffee, and 83% keeping livestock which was dominated by poultry, goats, pigs and dairy cattle, underscoring the role of mixed farming systems in resilience strategies (Etana et al., 2022).

Land access averaged 1.5 hectares, consistent with smallholder conditions, while farm income contributed US\$441.37 annually, complemented by off-farm earnings of US\$157.93. These findings highlight the dual reliance on farm and non-farm sources of livelihood, a pattern increasingly documented in East Africa (Mubangizi & Adekanla, 2024). The relatively high livestock ownership suggests adaptive strategies for food security, while modest education and income levels point to structural constraints requiring policy interventions (Oyet et al., 2025).

Table 2. Selected Socio-demographic and economic variables of the Respondents

Variable	Result (n=273)
Age of household head (years)	37.4
Farming experience of head (years)	15.4
Education of household head (years)	7.2
Households with children in school (%)	61.0
Households receiving remittances (%)	45.0
Households cultivating bananas (%)	30.0
Households cultivating coffee (%)	27.0
Households owning livestock (%)	83.0
Total land accessed (hectares)	1.5
Farm income (US\$/year)	441.4
Off-farm income (US\$/year)	157.9

Source: survey data.

Results show that some of the considerations taken into account by farmers prior to adopting the HVCs were diverse. As for hot pepper, farmers consider market access (20.7% of the 273 adopters) as the major aspect (Table 3). Access to remunerative markets is a major challenge faced by smallholder farmers in Uganda (Ninsiima et al., 2025). High product prices were also a major consideration (13.1%) as they embody the level of incentive for investment. The short turnover period was also a major consideration (10.6% of the adopters) since many farmers do not have access to alternative cash sources or credit so they prefer investing in crops where their limited funds can be recouped within a short period. Peer influence by fellow farmers (10.6% of the adopters) was also crucial, reflecting the importance of social capital (Wardhana et al., 2021). It partly improves their belief and confidence to grow the crops, learning from the experience of fellow farmers.

Table 3. Reasons given by smallholder farmers for growing the HVCs

Factor considered	Hot pepper		French beans		Okra	
	n	%	n	%	n	%
Easy market access	88	20.7	43	16.2	41	17.7
High product prices	56	13.1	22	8.3	30	13.0
Early maturing/quick turnover	46	10.8	47	17.7	43	18.6
Peer influence	45	10.6	37	13.9	26	11.3
Pays well/good income	36	8.5	14	5.3	19	8.2
Low production cost	35	8.2	14	5.3	19	8.2
Low labour requirement	29	6.8	25	9.4	9	3.9
Access to advisory services	23	5.4	17	6.4	18	7.8
Regular income	17	4.0	0	0.0	0	0.0
High yields	14	3.3	12	4.5	6	2.6
Stable price	11	2.6	0	0.0	8	3.5
Easy to produce	9	2.1	6	2.3	0	0.0
Others	17	4.0	29	11	12	5.3
<b>Total</b>	<b>426</b>	<b>100.0</b>	<b>266</b>	<b>100.0</b>	<b>231</b>	<b>100.0</b>

Source: survey data.

French beans farmers also considered the same factors, albeit in a slightly different order of ranking. The only factor among the top five mentioned by French beans farmers that was not among the ones considered by hot pepper farmers was low labour requirement. Access to labour is a major household constraint (Tennhardt et al., 2024). The okra farmers considered similar factors as those taken into account by hot pepper and French bean farmers. Other dominant considerations were the ability to bring good income, access to advisory services, good yields and stable prices, while others included household consumption, ease of production, experience, health reasons, access to inputs (seeds, fertilisers), regular income and social prestige.

The areas dedicated to the HVCs were analysed to ascertain level of interest in and commitment to the crops as compared to available resources. It is clear that farmers tend to allocate small hectares towards the HVCs. This is approximately 33.6% of their total land, for a household that adopted all the three crops, and about one third of this for those adopting only one out of the three crops (Table 4). This could be attributed to the high cost of inputs and the labour-intensive nature of these crops. However, such small areas also compromise efficiency levels partly due to diseconomies of scale.

Table 4. Acreage under production of the HVCs over a period of three seasons

Season	Hot Pepper		French Beans		Okra	
	n	Area (hectares)	n	Area (hectares)	n	Area (hectares)
2018B*	176	0.05	107	0.05	115	0.05
2019A**	176	0.08	86	0.04	114	0.04
2019B***	126	0.05	124	0.03	109	0.03
Mean	159	0.20	105	0.13	112	0.13

\* 2018B season refers to the second season of 2018 that runs from July to December, 2018;

\*\* 2019A refers to the first season of 2019 that runs from March to June, 2019;

\*\*\* 2019B is the second season of 2019 that runs from July to December, 2019.

Source: survey data.

Farmers were asked to express their views on the profitability of hot pepper, French beans, and okra. The results show that most respondents regarded these high value crops (HVCs) as profitable (Table 5). Out of 165 farmers who answered the question on hot pepper, 95.2% reported that the crop provides financial returns. For French beans, 94.4% of respondents considered the crop profitable, while 91.4% expressed the same opinion about okra. These findings suggest that farmers cultivate these crops with confidence in their ability to generate income, which helps them meet essential household needs such as school fees, medical expenses, and farm investments. This outcome is consistent with evidence from Uganda showing that the HVCs enhance smallholder profitability and market participation (Mugisha & Diiro, 2021), and with regional studies indicating that adoption of high value horticultural crops contributes positively to household income and welfare in East Africa (Okello & Sindi, 2022). Very few farmers claimed that the crops are not profitable, while some, e.g 1.8% for hot pepper, 3.2% for French beans and 6.9% for Okra, were not sure of the level of profitability of these crops.

Table 5. Farmers' perceptions about profitability of hot pepper, French beans and okra

Response	Hot Pepper		French Beans		Okra	
	n	%	n	%	n	%
HVCs are profitable to produce	157	95.2	117	94.4	106	91.4
HVCs are not profitable to produce	5	3.0	3	2.4	2	1.7
Not sure of profitability of HVCs	3	1.8	4	3.2	8	6.9
<b>Total</b>	<b>165</b>	<b>100.0</b>	<b>124</b>	<b>100.0</b>	<b>116</b>	<b>100.0</b>

Source: Field survey.

The above analysis would be incomplete if it relied solely on farmers' perceptions. To substantiate these views, profitability was further examined through gross margin analysis, with results presented in Table 6. The findings corroborate farmers' opinions, showing that the high value crops (HVCs) under study are indeed profitable. Gross margin values were highest for French beans, followed by hot pepper and okra. In the short run, farmers can cover the variable costs associated with producing all three crops, confirming their profitability. An additional analysis was conducted to compare gross margins across crops and within production seasons, using both pairwise comparisons among the HVCs and season-wise assessments. These results align with recent evidence from Uganda, where short cycle horticultural crops have been shown to generate favourable gross margins for smallholder farmers (Tumwine et al., 2023). Similar findings from Kenya demonstrate that French beans production consistently yields positive gross margins, reinforcing the conclusion that short-cycle HVCs provide reliable income streams for smallholders (Mwangi & Otieno, 2024).

Table 6. Mean Gross Margins (US\$ ha<sup>-1</sup>) of the HVCs over a period of 3 seasons

Season	Hot Pepper		French Beans		Okra	
	n	Gross margin	n	Gross margin	n	Gross margin
2018B	176	604	107	720	115	378
2019A	176	653	86	615	114	549
2019B	126	370	124	851	109	590
<b>Mean</b>	<b>159</b>	<b>541</b>	<b>105</b>	<b>727</b>	<b>112</b>	<b>507</b>

Source: survey data.

Seasonal comparisons of gross margins revealed statistically significant differences across crops and production periods. For hot pepper, gross margins were significantly higher in 2018B compared to 2019A ( $p < 0.05$ ), and similarly higher in 2018B relative to 2019B ( $p < 0.10$ ) (Table 7). In contrast, French beans showed no significant differences between the seasons examined. For okra, gross margins were significantly higher in 2018B compared to 2019A ( $p < 0.10$ ), and the same trend was observed between 2018B and 2019B, with the latter recording higher margins ( $p < 0.05$ ). These variations reflect shifts in yields and market prices across seasons, partly influenced by climatic variability and market dynamics. Such fluctuations underscore the production and income risks faced by smallholder farmers, consistent with evidence on seasonal profitability volatility in high value crops in East Africa (Ariho et al., 2024; Ndyetabula & Jeckoniah, 2025; Tumwine & Kansiime, 2024).

Table 7. Season-wise comparison of the HVCs gross margins (US\$ ha<sup>-1</sup>)

Crop	Seasons 2018B & (2019A)			Seasons 2018B & (2019B)			Seasons 2019A & (2019B)		
	Mean	St.dev	P-value	Mean	St.dev	P-value	Mean	St.dev	P-value
Hot pepper	604 (370)	2.58 (1.58)	0.02**	604 (653)	2.56 (2.80)	0.69	650 (370)	2.80 (1.58)	0.08*
French Beans	720 (851)	3.09 (3.65)	0.39	720 (612)	3.09 (2.64)	0.43	615 (851)	2.64 (3.65)	0.11
Okra	375 (549)	1.62 (2.36)	0.07*	375 (590)	1.61 (2.53)	0.03**	549 (590)	2.35 (2.53)	0.72

NB: \*\*\*, \*\* and \* denote significance at 1%, 5% and 10%. Figures in parentheses refer to the season in parentheses. It should also be noted that the Gross Margins are based on a hectare, but none of the farmers kept these crops on a full hectare as reported in Table 3 above.

Source: survey data.

French beans recorded higher gross margins (US\$ ha<sup>-1</sup>), overall, but these were accompanied by larger standard deviations, indicating greater variability and risk. Okra, in contrast, showed relatively lower standard deviations, suggesting more stable income streams. Seasonal differences in gross margins were mixed, with no consistent pattern favouring either season one or season two across the high value crops (HVCs) analysed. Pairwise comparisons revealed that French beans and hot pepper margins did not differ significantly in 2018B and 2019A, but French beans were significantly higher in 2019B ( $p < 0.01$ ) (Table 8). Hot pepper margins were significantly higher in 2018B ( $p < 0.05$ ) but significantly lower in 2019B ( $p < 0.05$ ). Across all seasons, French beans consistently outperformed okra in terms of gross margins. These findings highlight the dual nature of profitability and risk in the HVC production, reflecting seasonal variability in yields and market prices. Recent studies confirm that such fluctuations are common in horticulture, where climate variability and market dynamics drive both profitability and risk exposure (Kansiime and Wambugu, 2020; Nabirye & Musoke, 2019; Ochieng et al., 2017).

Table 8. Pairwise comparison of the HVCs gross margins (US\$ ha<sup>-1</sup>) by crop and seasons

Pairwise comparison	2018B			2019A			2019B		
	Mean	St.dev	p-value	Mean	St.dev	p-value	Mean	St.dev	p-value
Hot pepper & French beans	604	2.59		653	2.80		369	1.58	
	720	3.09	0.38	612	2.64	0.76	851	3.65	0.00***
Hot pepper & Okra	604	2.59	0.02**	653	2.80	0.38	369	1.58	
	378	1.62		549	2.35		590	3.65	0.03**
French beans & Okra	720	3.09	0.03**	632	2.64	0.57	851	3.65	
	378	1.62		549	2.35		590	2.53	0.07*
Overall comparison for three seasons									
	Mean	Standard deviation				P value			
Hot pepper & French beans	540	2.32				0.14			
	728	3.12							
Hot pepper & Okra	540	2.32				0.75			
	507	2.18							
French Beans & Okra	728	3.12				0.08*			
	507	2.18							

\*\*\*, \*\* and \* denote significance at 1%, 5% and 10%.

Source: survey data.

A significant difference in gross margins was observed between French beans and okra ( $p < 0.10$ ), while no significant differences were found between hot pepper and French beans or between hot pepper and okra. Variations in gross margins can be explained by shifts in input and output prices and yield performance, which are strongly influenced by agroclimatic conditions and seed quality (Mang'ana et al., 2023). Farmers' technical capacity, particularly their ability to apply agronomic practices on schedule, also shapes profitability outcomes (Msangi et al., 2023). Beyond production factors, the limited domestic market for these high value crops necessitates reliance on export destinations in Europe and Asia, where stringent quality standards heighten both marketing risks and costs (Kagorora et al., 2021).

Farmers ranked the needs that they seek to address by producing the HVCs. Education, proxied by securing school fees, was the highest ranked objective of households as evidenced by the rankings (Table 9; Rank 1 refers to the most important objective followed by ranks 2, 3, 4, 5 and 6). In order of priority, other household needs that farmers intend to address by taking on production of the HVCs were to: invest in trade, ensure steady cash flows for ploughing back into crop production, buy more land, cover health care expenses and invest in livestock farming, buy a car or motorcycle and allocate for household consumption.

Farmers in different countries exhibit a different hierarchy of motives and goals. In Uganda, education for children has been reported as a key objective of farming households (L'Roe et al. (2022) and Juma et al., (2024). In Poland, short-term goals of economic security particularly dominate farmers' attitudes (Ministry of Agriculture and Rural Development (Poland, 2025). The results of the study corroborate earlier findings which conjecture that the practical behaviour of farming households cannot be explained by the optimisation of a single goal but by a compromise between multiple goals (Uhlenbrook et al., 2022).

Education ranks at the top of household priorities among farming families in the study area, because it is widely recognised as the most reliable pathway out of poverty and a foundation for resilience. Schooling equips individuals with the ability to access and apply information, improving productivity and decision-making in both farm and non-farm activities. Households headed by more educated individuals are significantly more likely to escape poverty, while those with low human capital remain vulnerable (Mwesigye & Matsumoto, 2024). Longer periods of schooling further increase upward mobility, expand income opportunities, and strengthen resilience to shocks, making education a decisive factor in household welfare outcomes (Balojja & Sebbowa, 2024). Results show that on average 3 children are in school (Table 8), about 60% of the total household size, which conforms to the results of UBoS (2024). A total of 61.1% of the Households had at least one person in school.

This priority comes at a heavy cost. Families often dedicate a large share of their budgets to school fees and related expenses, straining limited rural incomes. Gender disparities intensify the challenge: although boys and girls enrol, girls are more likely to drop out at critical stages such as primary and A Level due to financial constraints, cultural expectations, or early marriage. Yet, female education yields especially strong returns, reducing poverty, improving child health, and empowering households socially and economically (Nanyonjo, 2025). To meet these costs, farming households increasingly turn to high value crops, as a means of generating the funds needed for school fees. Diversification into such crops provides higher income streams compared to subsistence farming, enabling families to sustain educational investments. This linkage between agriculture and education highlights the importance of policies that expand access to markets, credit, and extension services, ensuring that farming can effectively finance schooling (Okello & Mugisha, 2024).

Table 9. Mean number of children in the study Households at different school levels compared by gender

Education Level	n	Male	Female	t-Statistic	p-value
Nursery	38	0.4	0.3	0.55	0.58
Primary	99	0.5	0.3	2.00	0.05
O Level (Senior 1–4)	29	0.4	0.2	1.95	0.06
A Level (Senior 5–6)	8	0.3	0.1	2.15	0.04
College/Tertiary/University	8	0.2	0.1	1.95	0.06
<b>Total Across All Stages</b>		2.0	1.0	0.90	0.36
<b>Total Children in Household</b>		2.5	2.2	1.16	0.25

Source: survey data.

Investment in trade, ranked second among farmers' objectives, reflects diversification into non-farm activities, a strategy increasingly common in agrarian economies (Table 10). Diversification is widely recognised as a risk mitigation measure, enabling households to buffer against agricultural uncertainties while enhancing resilience (Kansiime & Wambugu, 2022). Steady income, ranked third, is equally critical, as liquidity ensures farmers can meet operational expenses and reinvest in crop production cycles. Access to credit and financial flows has been shown to significantly improve productivity among smallholder farmers in Sub-Saharan Africa (Khan & Kim, 2025). Purchase of land, ranked fourth, underscores its role as a fundamental factor of production. For many households, securing adequate land remains central to sustaining agricultural livelihoods. Moreover, land tenure systems in Africa are often complex and fragmented, reinforcing the urgency for farmers to secure ownership early to safeguard long-term investment (Holden, 2021).

Currently, only 10% of the land in Uganda is titled, many alterations of titles are being made, and this is leading to several disputes (Rugadya & Nsamba-Gayiiya, 2022) that cause uncertainty and frustration among farmers. Further, land is a fixed resource with an increasing population having a growing pressure on it and land fragmentation. Health care ranked fifth, and this implies recognition by farmers of the importance a healthy household that plays a role in providing the much-needed family labour to supplement hired labour (Christiaensen, 2021). Further, one of the causes of poverty is ill health (Alkire et al., 2023). Investing in livestock to further diversify farming activities ranked sixth. Livestock possession is widely used as an indicator of wealth and wealth differentiation (FAO, 2024). Acquiring a car or a motorcycle to improve mobility of people and produce transportation was ranked seventh. Meeting household consumption needs such as purchase of food crops that are not raised by the households for food security, sugar, salt, beef and other sauce types came last among the priority problems that the farmers intended to solve through adoption of the HVCs. The ranking of steady income above food security implies that the HVCs are grown primarily for cash income.

Table 10. Ranking of Household needs based on weighted averages

Household Needs	Ranks (1-5)					Weighted total	No. of ranks	Weighted average	Overall rank
	1	2	3	4	5				
School fees	70.9 (166)	21.8 (51)	7.3 (17)	0.0 (0)	0.0 (0)	463.7	3	154.6	1 (n=234)
Investment in trade	38.7 (12)	12.9 (4)	48.4 (15)	0.0 (0)	0.0 (0)	390.3	3	130.1	2 (n=31)
Steady cash inflows for HVCs operations	67.9 (55)	22.2 (18)	6.2 (5)	3.7 (3)	0.0 (0)	454.3	4	113.6	3 (n=81)
Buying land	64.9 (24)	10.8 (4)	21.6 (8)	2.7 (1)	0.0 (0)	437.8	4	109.5	4 (n=37)
Health care expenditure	24.7 (21)	44.7 (38)	27.1 (23)	3.5 (3)	0.0 (0)	390.6	4	97.6	5 (n=85)
Investment in livestock	16.1 (5)	58.1 (18)	3.2 (1)	22.6 (7)	0.0 (0)	367.7	4	91.9	6 (n=31)
Buying a car/ motorcycle	23.1 (9)	23.1 (9)	23.1 (9)	30.8 (12)	0.0 (0)	338.5	4	84.6	7 (n=39)
Household consumption	16.3 (25)	52.9 (81)	22.9 (35)	6.5 (10)	1.3 (2)	376.5	5	75.3	8 (n=153)

Figures in parentheses represent weighted percentages of responding farmers per rank, unless otherwise indicated.

Source: Field survey.

A further analysis of the level achievement of the household needs for producing the HVCs reveal that the school fee objective was fully achieved since the funds that were planned for this objective were allocated to it fully and even beyond (Table 11). There was no significant difference between the funds that the households planned to spend on fees and what was actually spent ( $P>0.05$ ). This attests to the importance that farming households attach to education. No funds were allocated to land acquisition and purchase of cattle. These findings emphasise an important fact that, given the current dismal sizes of operation as evidenced by the area under each of the HVCs (0.05, 0.05 hectares and 0.1 for okra, French beans and hot pepper respectively during the season of 2018B), farmers cannot depend on the HVCs to achieve their needs. However, it is also noteworthy that even though the prioritised needs were not fully achieved, the HVCs contributed about 36.5% towards the needs. A case in point is about funds (US\$ 7) that were allocated to purchase of pigs, but whose planned expenditure was US\$ 69. This shows a significant difference ( $p<0.01$ ) between what was planned and what was spent. Likewise, other objectives are allocated funds according to household priorities (health and household consumption needs) whose planned expenditures are significantly higher ( $p<0.01$ ) than the actual expenditure. The benefits that are aspired are linked to various life goals (or values) farmers aspire for namely, respect, security, achievement, and happiness (Sumberg et al., 2023).

Table 11. An analysis of level of achievement of farmers' financing needs using funds from the HVCs. An analysis of the "before" and "after" scenarios using ANOVA

Objective	Frequency (n)	Planned expenditure (US\$) ("before" scenario)	Actual expenditure (US\$) ("after" scenario)	p-value
Purchased Land	78	1337	0	0.000***
Cattle	101	827	0	0.000***
Pigs	57	69	7	0.000***
Health	34	55	13	0.000***
Fees	226	193	199	0.350
Consumption needs	83	138	26	0.000***

\*\*\*, \*\* and \* denote significance at 1%, 5% and 10%.

Source: survey data.

Among the top eight priority needs addressed by the studied households, investing in trade and securing steady income for reinvestment in high value crops (HVCs) was not mentioned when evaluating achieved needs. This omission can be attributed to overwhelming household goals relative to the limited income generated from the HVCs. Peer-reviewed studies confirm that smallholder farmers in Uganda often rely on external financing sources to support agriculture and trade activities, reflecting the structural mismatch between household aspirations and agricultural returns (Orwothwun & Qutieshat 2022; Rijksdienst voor Ondernemend Nederland, 2022, and Economic Policy Research Centre, 2022).

Income from the HVCs was utilised in diverse ways beyond the set household priorities. While a significant share was directed toward recurrent expenses such as school fees, household consumption, and healthcare, expenditure on tangible assets was also substantial. Of the total yearly household income, estimated at US\$ 742, the HVCs contributed US\$ 245, representing 33% of the total. This finding underscores the significant role of the HVCs in household welfare and suggests that scaling up production could further enhance their contribution. Recent peer-reviewed evidence shows that rural households in Uganda strategically allocate agricultural income across education, health, and asset accumulation, reinforcing the importance of the HVCs in poverty reduction and resilience building (Okello & Mugisha, 2024).

## Conclusions and Policy Recommendations

The study establishes that high value crops (HVCs), such as hot pepper, French beans, and okra, are central to financing household needs among smallholder farmers in Central Uganda. Education, particularly the payment of school fees, is the foremost driver of adoption, with households prioritising schooling as a pathway out of poverty. Farmers also consider market access, high product prices, quick turnover, and peer influence when deciding to grow the HVCs. Profitability is widely acknowledged, with gross margins averaging US\$ 1,003 ha<sup>-1</sup> for French beans, US\$ 816 ha<sup>-1</sup> for hot pepper, and US\$ 783 ha<sup>-1</sup> for okra, though seasonal fluctuations and variability in returns are evident.

Despite contributing about one-third of household income, production is constrained by small land parcels (0.03–0.10 ha), high input costs, and limited advisory services. As a result, while school fees are consistently covered, other household priorities such as land acquisition, livestock investment, and healthcare remain only partially achieved, with households relying on other crops, livestock, and off-farm activities to bridge the gap.

To address these constraints, interventions should prioritise strengthening market access and stabilising prices, while enhancing productivity through improved varieties, irrigation, fertilisers, and mechanisation. Policies that link agricultural income to education financing are critical, given that school fees are the primary motivation for the HVC adoption. Expanding extension and advisory services will improve technical capacity, while climate-smart practices and crop insurance can mitigate seasonal risks. Partnerships between farmers, the private sector, and public institutions should be reinforced to ensure timely access to affordable planting materials and inputs. Scaling up production to benefit from economies of scale, coupled with diversification into both farm and non-farm activities, will enable households to meet a broader range of needs. Ultimately, a rigorous yield enhancement agenda, supported by research and policy, is essential to unlock the full potential of the HVCs as a sustainable financial lifeline for smallholder households in Central Uganda.

## Acknowledgment

We extend our gratitude to Rockefeller Foundation and SIDA for the funding. We also appreciate Dr. Samuel Muwanga (formerly with the National Agricultural Research Organisation) and Mr. Sam Magala (Uganda Cooperative Alliance), who assisted in drafting of the data collection tools and participated in the data collection process. Farmers in the study area are greatly appreciated for availing the data that was used to write this paper.

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For citation:

Lwasa S., Mugisha J., Sserunkuuma D., Mugenyi T. (2026). High Value Crops and Their Role in Financing the Needs of Smallholder Farming Households in Central Uganda. *Problems of World Agriculture*, 26(1), 18-34; DOI: 10.22630/PRS.2026.26.1.2