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DETERMINING HOUSEHOLD AND FARM LEVEL GOVERNANCE FACTORS AFFECTING THE TRANSITION TO HOUSEHOLD FOOD SECURITY IN ISINGIRO DISTRICT, SOUTH-WESTERN UGANDA

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ABSTRACT

Governance, in particular, decision-making plays a significant role in influencing the transition to households' food security. It helps in addressing causative factors responsible for undermining household sustainable food security. This study aimed at determining household and farm level governance factors affecting the transition to household food security. Respondents who participated in the study were 284. The study employed a cross-sectional survey design to obtain qualitative and quantitative data on household food security. Household interviews, focus group discussions, key informants' interviews, and observations were used to collect data. Qualitative data were analyzed by categorizing them into themes to find out respondents' experiences and opinions. Quantitative data were coded, entered, cleaned, and summarized using descriptive statistics, frequencies, and chi-square. The study used Multiple Regression Model to establish the extent to which selected variables were responsible for the transition to household food security. Results on maize production showed that the association of occupation of coefficient (0.006) and income (-0.54) had a significant and positive value P=0.000 (P<0.05) and was related to food security, while the association between family size (0.006) and land size (0.055), marital status (0.092), and land acreage (-0.108) had no significant relationship. Regarding beans, results indicated that the relationship between occupation (coefficient -0.059 and income (0.059) had a significant value P= 0.000, while the association between family size (0.096) and land size (0.055, marital status (0.092) and land acreage (-0.108) had no significant association. In the case of bananas, the association of occupation (0.038) and income (0.142) had a significant value of P=0.000, while the relationship between family size (0.010) and land size (-0.026), marital status (0.014), and land acreage (0.184) had no significant relationship. The study recommends increased government support in establishing effective decisions on household food security and strengthening them through a participatory and bottom-up approach. The study also recommends that the government and related stakeholders invest in household capacity building for inclusive gender participation in decision-making pertaining to food security; establish resilient household food production and increase support for strengthening it further. There is also a need for supporting climate change mitigation, environmental conservation, and farm-level landscape restoration.

Key words: household, governance, transition, food security, participatory, sustainable, policy, livelihood

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INTRODUCTION

Uganda is one of the countries implementing Goal 2 of the Sustainable Development Goals (SDGs) [1]. Eighty percent of the agricultural households participate in farming for their consumption, making agriculture the backbone of a large percentage of the populace [2].

However, food security remains farfetched due to degradation and climatic conditions that affect soil quality [3]. The Uganda Fertilizer Policy indicates that the loss of soil nutrients is one of the uppermost challenges in the African continent, adding to the disparities in land resource distribution, with 66.2% of the households relying on utilizing less than one hectare of agricultural land [2].

Further, the COVID-19 lockdown has affected Uganda's household food security, causing low farm income, low consumption (44.4%), fewer food varieties (34.3%), and missing meals (37.6%) [4].

The rapidly growing population also contributes to food insecurity in the country. Around 2021, the population was estimated at 42.8 million, having grown from 5 million in 1948 [5], with 33% of the population (44 million) being poor [6].

In spite of the government plans and the initiation of the National Development Plan III 2020/2021-2024-2025 for enhancing agricultural productivity, food insecurity remains unresolved [7]. The earlier study by Mulinde *et al.* [8] in Central and Eastern Uganda indicates that prolonged drought, unreliable rainfall, land scarcity, the decline in soil fertility, poor land use management, and crop loss have kept many households food insecure. Nevertheless, this situation has driven household farmers to adapt to the use of inorganic fertilizers and seek extension services on how to improve food production.

In Isingiro District, household food insecurity is a critical problem which resembles earlier results [9]. This study shows that the district has been experiencing an increased incidence of drought, crop failure, and less precipitation in the last decade: and this situation has been attributed to deforestation in the district.

This paper aimed at determining household and farm level governance factors affecting the transition to household food security. The article generates essential information for the government and other stakeholders on the need to review agricultural policy and render support for strengthening household food production. The study rejects the hypothesis, *"there is a significant relationship between*

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household and farm level governance factors that affect the transition to household food security in the study sites."

MATERIALS AND METHODS

The study was conducted in the Isingiro district covering five villages in three civil parishes (Fig.1). The rationale for selecting this area was the highly agricultural nature of its population, long history of drought, and irregular rainfall patterns [9]. The district is in South-western Uganda, about 279 and 47 Kilometres from Kampala and Mbarara Cities. Isingiro district has a population of 486360, an annual rainfall of 1200 mm, loam, sand, and clay soils, with bananas, maize, and beans being predominantly grown [10]. The study used qualitative and quantitative approaches to get a clear picture of the study problem. The study targeted households (26) per village, selected using a systematic sampling technique. The sources from which data was got included primary and secondary sources. The study administered a semi-structured questionnaire to the primary respondents in a face-to-face interview. Fifteen key informants (KIIs): farmers and local leaders were selected purposively. The KIIs were selected based on their experience in household farming and knowledge of the study problem. The Focus group discussions (FGDs) constituting 15 participants were engaged using a structured questionnaire. The sample size of 400 respondents was determined using a formula by Yamane 1967 N= N/ (1+N (e)2 where N signifies sample size, e original error at 10% (0.05), and N the total population under study [11]. Therefore, N = $\frac{486360}{1+486360\ (0.05)^2}$ = 400

The study used open-ended, closed-ended questions to collect qualitative data analysed by grouping them into themes which included causes of food insecurity, crop quantity, and means of overcoming food insecurity. Quantitative data were coded, entered, cleaned, and summarized using descriptive statistics, frequencies, and chi-square. The study employed a checklist to confirm the steps followed. The study also used Multiple Linear Regression Mode statistics to analyze the association between a dependent variable and numerous independent variables to envisage the value of a dependent variable. The dependent variables were maize, beans, and bananas and independent variables included land size, land acreage, marital status, occupation, family size, and income.

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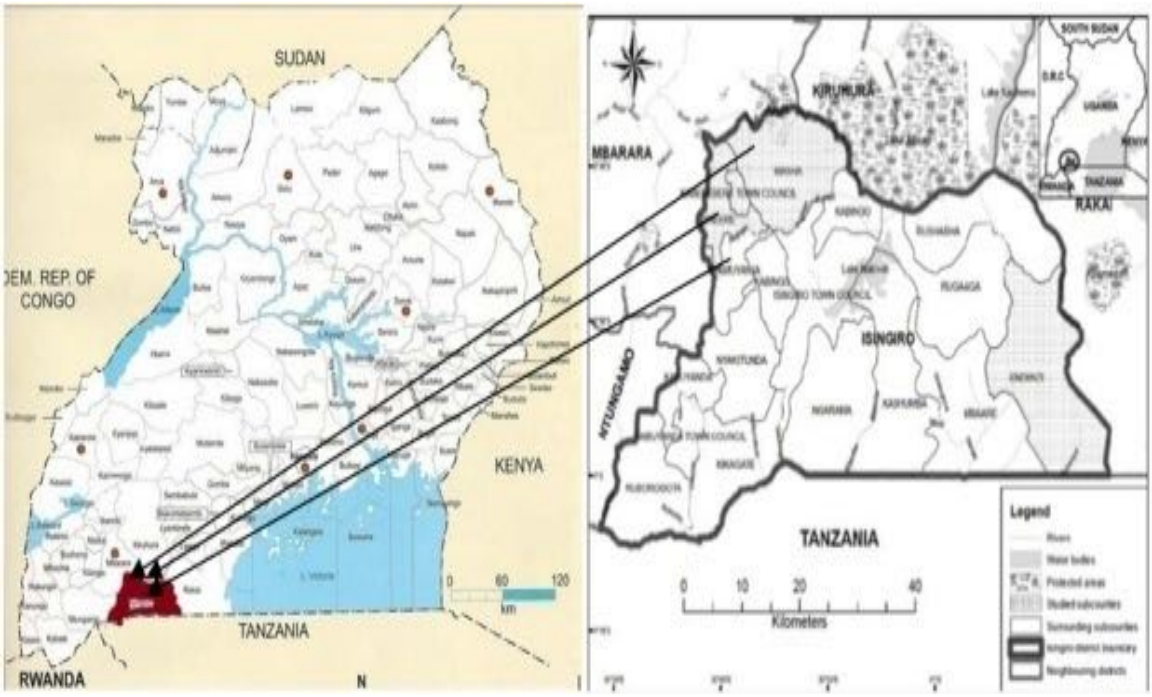

Figure 1: Location of the study site of Isingiro District

Ethical approval

The Graduate School of the University of Nairobi approved the study proposal. Later, the Research Ethics Committee of the Mbarara University of Science and Technology and the National Council of Science and Technology approved it. The District Authority also granted permission to conduct research in the specified areas.

RESULTS AND DISCUSSION

Social-demographic characteristics

A summary of the social-demographic characteristics of primary respondents is in table 1. The demographic characteristics of FGD and KII participants are in table 2.

The study indicated that male-headed families were more advantaged than female-headed ones regarding food production. In all the parishes, the study revealed that 65% of the married male-headed households as food secure compared to 35% of married female-headed households (Fig. 2). FGD (100%) and KIIs (80%) confirmed this finding in all the parishes. A participant in the FGD stated, *"our household is large and food insecure because it lacks a male head".* One key informant also asserted, *"In our village, majority of the female-headed households are food insecure".*

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The higher percentage of food secure male-headed households means that marriage is a significant factor in food production. This finding matches previous studies in Teleyayen Sub-watershed, Ethiopia, where male-headed households (22.09%) than female-headed ones (16.09%) were food secure [12]. The male-headed households tend to be more stable, use relatively large land acreage, with more access to resources than female-headed households. This finding reflects the previous results in South Africa [13], where more male-headed households than female-headed ones were food secure. The implication is that male-headed households have a comparative advantage and more chances of accessing enough food than female-headed ones.

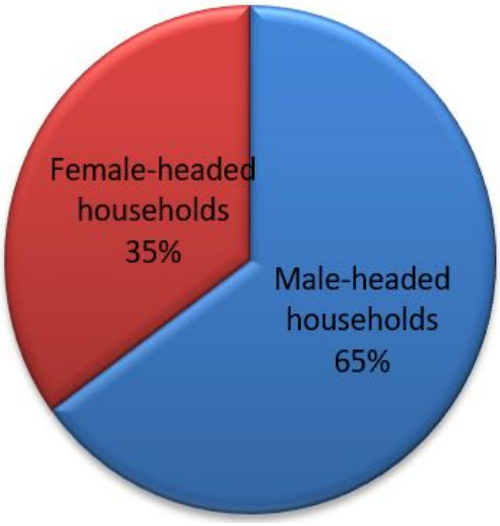

Figure 2: Proportion of Food Secure Households segregated by the nature of Household Headship

The total number of interviewed respondents was 284. More married people were food secure contrasted to other marital status categories (Fig. 3). This finding matches a previous survey on features of families in the United States. The survey found single mothers and divorced people more susceptible to food insecurity [14]. This finding implies that married couples aim at more food production and fulfilment of the primary needs of their families.

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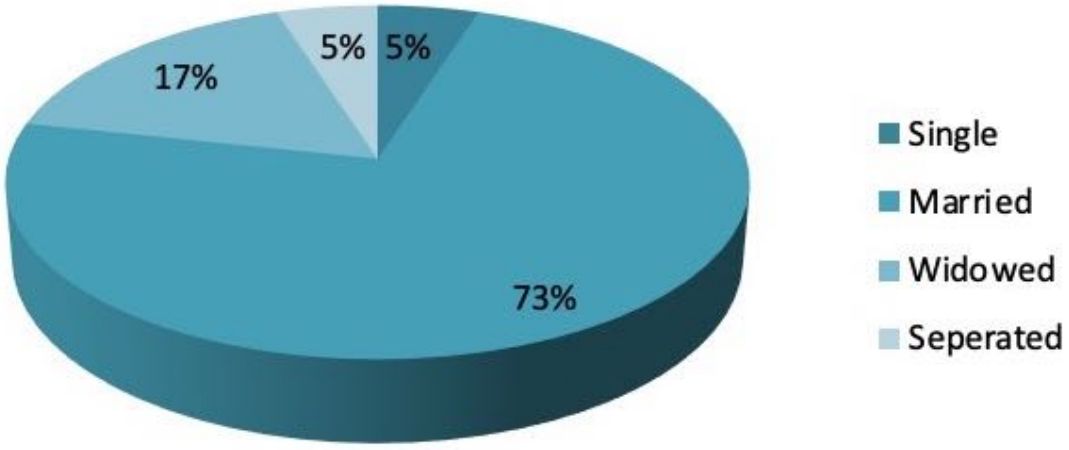

Figure 3: Food Status of each Category of Marital Status

Most households (5-6 members) had inadequate assets (Fig. 4). This finding on family size means that large households owning insufficient resources are food insecure. These results match previous findings in the Western Highlands of Guatemala, showing that for more than half of the homes (52%), food production did not meet domestic needs and therefore needed other avenues of food [15]. Resource-restrained families are often food insecure and affect other household essentials due to high consumption levels. The earlier study results by Ogunniyi *et al.* [16] in Nigeria support this view, where families with ≥ 5 members had a 6.4% food insecure incidence. By implication, larger families may continue to face hunger unless there is policy intervention to address the problem.

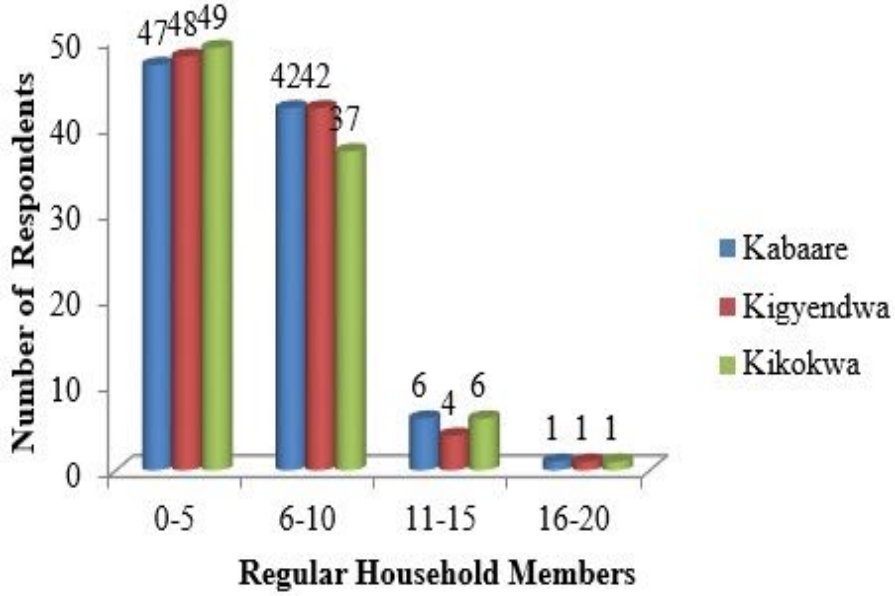

Figure 4: Family Size per Parish

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Household decision-making on food security Decision-making and the means for attaining food security (Fig. 5) are essential. Although there were variations in decision-making across the parishes, more household heads in Kabaare (43%) involved their members in decision-making than in Kikokwa (39%) and far less in Kigyendwa (18%). A previous study in rural Tanzania indicated differences in household decision-making authority on farms between husbands and wives [17]. Whereas household members desire to reach a consensus, men tend to exclude family members due to patriarchal norms. Pulling resources together becomes difficult hence causing food insufficiency.

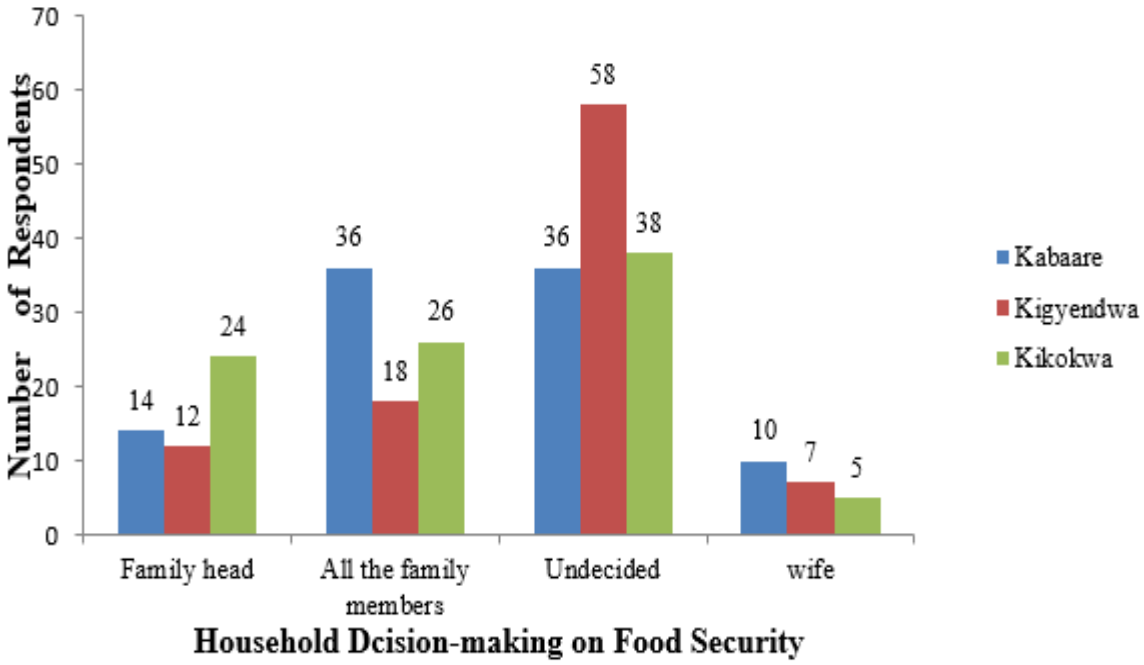

Figure 5: Household Participation in Decision-making per Parish

Relationship between household-farm factors and their influence on food security The Chi-Square analysis (Table 3) was employed to test the association between the variables: family size, land size, occupation, income, land acreage used for food production, and marital status.

The family size had an insignificant association with land size (statistical value of 10.825a at p=.288>0.05). This finding matches earlier findings by Herrera *et al.* [18] in northern Madagascar, which demonstrates the potential of larger households with smaller land sizes to minimize food insecurity through labor provision. However, the present study shows that more increase in the family size is likely to exert more pressure on the consumption needs than utilizing the available land productively. This echoes earlier study results in the Teleyayen sub-

watershed, Ethiopia [12], implying that an increase in family size without an increase in land size adversely affects food security.

According to Chi=Square (X2) results, there was no significant relationship between marital status and land acreage utilized for food production (statistical value of 8.860a at P=.182 >0.05). This finding disagrees with the previous study results in Sinana District, Ethiopia, which indicate that households headed by married heads are likely to be food secure due to the size of land owned, mutual support, and income level [19]. The married are likely to work harder to utilize the available landholding and secure more land for food production due to their responsibilities toward fulfilling children's needs.

The study findings revealed a positive and significant relationship between household occupation and income (statistical value of 67.458a at p=.000 < 0.05). This finding concurs with the previous study findings in Ethiopia [20] on the positive association between farm activities and income. Farm undertakings enable households to earn their living though they may not generate enough income. An increase in farm earnings may lead to investments in other non-farm areas. The fact that households (68%) in the study area earn a higher income from crop growing manifests a positive association between occupation and income. This finding demonstrates that the higher the income levels, the higher the degree of engagement in farming. This finding echoes earlier study results by Tesfaye *et al.* [21] in Arsi Zone, Ethiopia, where household average income increased to 50%, and the effect of the adoption of improved wheat varieties was P< 0.05. The implication is that households that earn more income are likely to purchase more land, farm inputs, and extend their revenue base.

Quantity of primary crops harvested, consumed, and sold

Results, summarized in Table 4, indicate the primary crops and their quantity. Although all the crops were important, bananas doubling as a food and cash crop were the most significant for households' survival. These findings reflect the earlier study results in Rugaaga sub-county, Isingiro district, where FGD participants unanimously mentioned that since 1998 bananas have been relied on as their significant crop for cooking and commercial purpose [9]. Households that lack reasonable banana plantations are inclined to severe food insecurity. This crop's significance echoes the earlier findings in GanoFofa Zone, Ethiopia [22]. However, important household location (Table 5) and external factors (Fig. 6) affect most crops making households food insecure. This finding implies that location and external factors deny households the right to enjoy agricultural benefits while perpetuating food insecurity.

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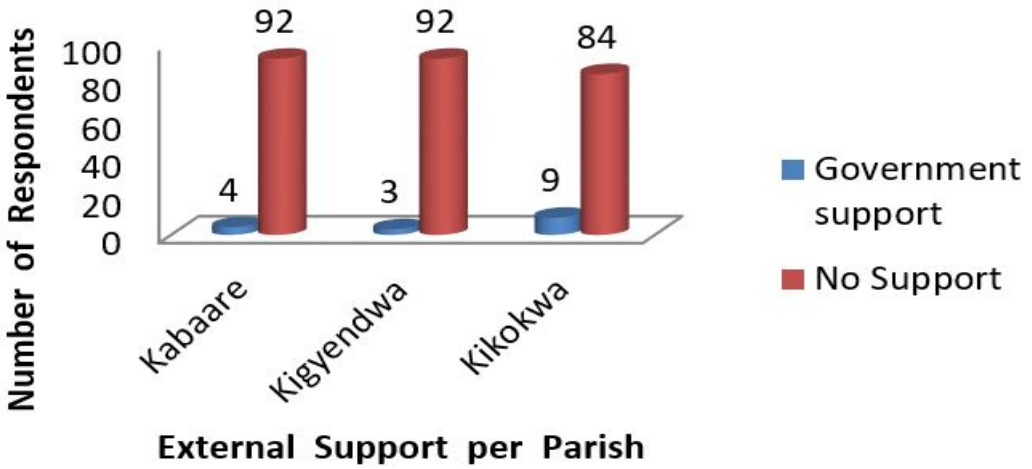

Figure 6: External Support towards Household Food Security

Based on multiple linear regression results and coefficient of determination value (Table 6), most variables land size, family size, occupation, and marital status had a positive and insignificant effect on the production of the major food crops. This finding relates to the past study by Getaneh *et al.* [23] in the Asayita district, Ethiopia, where household size, marital status and land are related to food security in a way that they can positively influence it. Marital status and large household sizes alone are not an assurance to escape food insecurity [19]. A large household that focuses more on consumption than labor provision, increasing the available land, or using it efficiently is prone to food insecurity. This finding implies that other factors influence food security as reflected in the model equation (Table 7), where e = error term (other factors not addressed in explanatory variables).
Therefore, the hypothesis, *"there is a significant relationship between household and farm level-governance factors that affect the transition to household food security in the study sites"* is rejected.

Consequently, less than 50% of households per parish accessed adequate food (Fig.7). These findings reflect past study results in Masha sub-county, Isingiro District [24], implying that no one cause for food insecurity in the study area.

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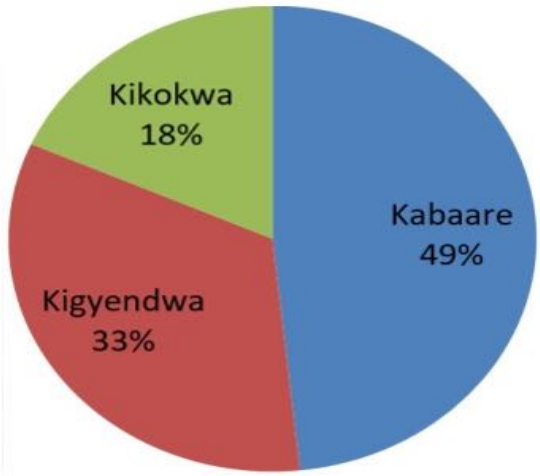

Figure 7: Household access to Sufficient Food

Some households adopted strategies (Fig. 8) for overcoming food insecurity. The findings match previous study results in Karenga and Kepchesombe Sub-counties, north-eastern and eastern Uganda, where farmers (84.1%) planted different crops and 52.1% diversified crops [25]. Adopting alternative farming strategies is a better way to improve household food security. The implication is that the adoption of such improves food status.

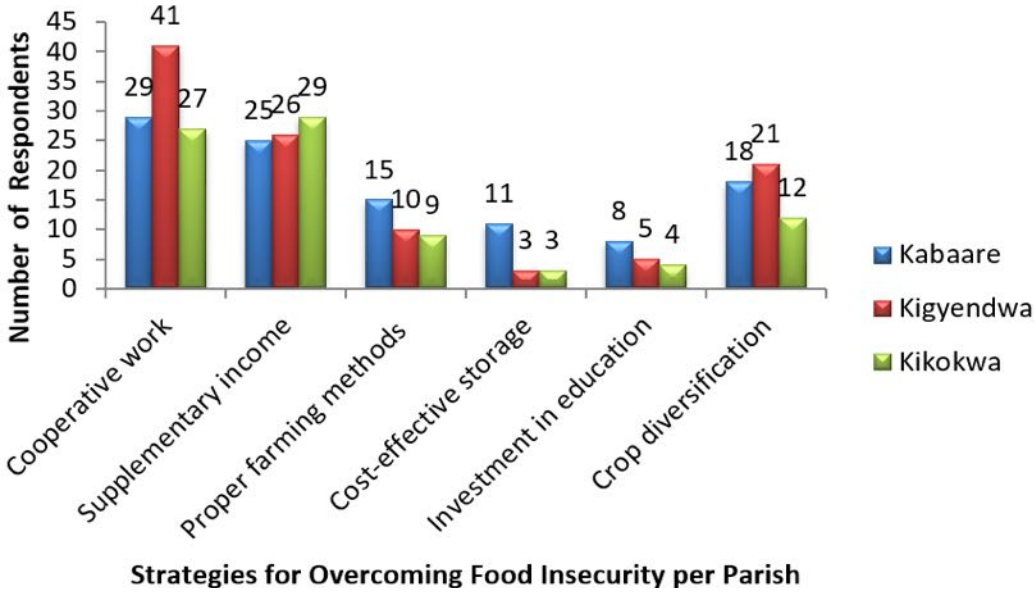

Figure 8: Strategies for Overcoming Food Insecurity per Parish

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CONCLUSION

Most households are food insecure due to many factors. The acreage of land, family size, primary occupation, monthly income, and marital status have a positive and insignificant effect on food production. The study rejects the hypothesis; "there is a significant relationship between household and farm level governance factors that affect the transition to household food security in the study sites ". The involvement of household members in decision-making remains a primary driver toward food security. The shift to household food security is only possible under transformative leadership committed to engaging stakeholders in decision-making for effective service delivery.

The study recommends increased government support for effective household decisions on food security and strengthening them through a bottom-up approach. Climate change mitigation, environmental regeneration, and farm-level landscape restoration are also needed. There is need for further studies on enhancing household capacity to address governance issues and factors such as land, income and family size affecting food security.

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Disclosure statement

No potential competing interest was reported by the authors

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Table 1: Social Demographic Characteristics of Respondents

Name of Parish	Gender (%)		Age (%)	Marital Status (%)	Literacy Level	Family Size (%)	Main Occupation (%)	Land size (%)	Land Acreage (%)	Monthly Income (US $)
	Male	Female	Less than 20	Married (%)	Non-formal Education (%)	0-5 members	Crop growers	< 1 acre	less an acre	Us $ 28
Kabaare	7	27	67	36	71	33	31	42	41	34
Kikokwa	13	20	33	30	24	34	34	24	29	36
Kigyendwa	10	23		34	5	33	35	34	30	30
			20-29	Separated	Primary	6-10 members	Pastoralists	1 acre	1 acre	30.5-55.5
Kabaare			30	18	29	35	100	31	31	32 29 39
			30-39	Widowed	Secondary	11-15 members	Cropping & cattle keeping	2 acres	> 1 acre	58-83
Kabaare			36	35	41	37.5	61	22	29	50
Kikokwa			35	28	38	37.5	39	39	41	17
Kigyendwa			29	37	21	25		39	30	33
			40- 49	Single	University	16-20	Civil servants	> 2 acres	2 acres	86-111
Kabaare			29	25	46	33.3	50	36		33.3
Kikokwa			27	50	8	33.3	17	42		33.3
Kigyendwa			44	25	46	33.3	33	22		33.3
			50-59		Others		Self employed			114 & above
Kabaare			48		24		31			21
Kikokwa			26		36		8			21
Kigyendwa			26		40		61			58
			60-69				Non-occupation holders			
Kabaare			40				100			
Kikokwa			25							
Kigyendwa			35							
			70+							
Kabaare										
Kikokwa			57							
Kigyendwa			43							

Source: Field Data

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Table 2: Demographic Characteristics of FGD and KII participants

Variable	FGD Participants		KII Participants	
	Frequency	Percentage	Frequency	Percentage
Gender				
Females	10	67	6	40
Males	5	33	9	60
Age				
20-39	1	7	1	7
40-59	9	60	5	33
60-70	5	33	9	60
Marital Status				
Married	11	73	13	86.6
Widowed	2	13	1	6.6
Separated	1	7	0	0
Single	1	7	1	6.6
Education				
Non-formal	0		0	0
Primary level	8	53	3	20
Secondary level	4	27	8	53
University /tertiary	3	20	4	27
Main Occupation				
Famer	10	67	12	80
Civil servant	5	33	3	20

Source: Field Data

Table 3: Association of Variables

	Pearson Chi-Square Tests		
	Value	Df	Asymp. Sig. (2-sided)
Family size and land size	10.825[a]	9	0.288
Family size and land acreage	4.932[a]	6	0.553
Marital status and land acreage	8.860[a]	6	0.182
Main occupation and monthly income	67.458[a]	20	0.000

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Table 4: Quantity of Primary Crops Harvested, Consumed and Sold

Name of Crop	Quantity harvested	Kabaare Parish	Kigyendwa Parish	Kikokwa Parish
Maize	50 Kgs or <	45%	23%	32%
	51-100 Kgs	71%	0%	29%
	101-150 Kgs	50%	25%	25%
	151+	14%	29%	57%
Beans	50 Kgs or <	20%	40%	40%
	51-100 Kgs	11%	22%	67%
	101-150 Kgs	50%	25%	25%
	151+Kgs	31.5%	37%	31.5%
Bananas	20 bunches	37%	33%	27%
	21-50 bunches	23%	18%	59%
	51-100 bunches	27%	50%	23%
	101-300+ bunches	19.20%	49.30%	31.30%
Maize, beans & bananas	Combined quantity consumed			
	50 Kgs or <	33%	37%	30%
	51-100 Kgs	26.7%	33.7%	39.5%
	101-150 Kgs	55%	9%	36%
	151 + Kgs	0%	0%	100%
Maize, beans & bananas	Combined quantity sold			
	50 Kgs or <	37%	28%	35%
	51-100 Kgs	3%	51%	26%
	101=150 Kgs	31%	46%	23%
	151+ Kgs	67%	0%	33%

Source: Field Data

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Table 5: Major Household Location Factors Influencing Food Security

	Frequency	Percentage
Geographical conditions		
Effects of climate change		
Kabaare	81	32
Kigyendwa	84	35
Kikokwa	85	33
Total	250	100
Environmental degradation		
Kabaare	56	30
Kigyendwa	64	35
Kikokwa	85	35
Total	185	100
Infertile soils/land shortage		
Kabaare	76	32
Kigyendwa	82	35
Kikokwa	79	33
Total	237	100

Source: Field Data

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Table 6: Multiple Linear Regression Results and Coefficients of Determination Value

Coefficients[a]						Multiple Liner Regression: Adjusted R Square
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
(Constant)	3.794	.496		7.646	.000	
Size of land in acres	.080	.190	.055	.418	.676	
Land acreage for food production	-.206	.252	-.108	-.817	.414	-0.006
Number of regular household members	.015	.153	.006	.096	.923	
Main occupation	.008	.091	.006	.092	.927	
Monthly income	-.076	.089	-.054	-.856	.393	
Marital status of respondent	.241	.159	.092	1.518	.130	
a. Dependent Variable: Maize harvested)						

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	-0.004
		B	Std. Error	Beta			
1	(Constant)	5.063	.228		22.156	.000	
	Size of land in acres	-9.521E-5	.088	.000	-.001	.999	
	Land acreage for food production	-.055	.116	-.062	-.471	.638	
	Number of regular household members	.020	.071	.017	.284	.777	
	Main occupation	-.040	.042	-.059	-.956	.340	
	Monthly income	.039	.041	.059	.940	.348	
	Marital status of respondent	-.103	.073	-.085	-1.410	.160	
a. Dependent Variable: Beans produced (Kgs)							

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	0.042
		B	Std. Error	Beta			
1	(Constant)	.637	.490		1.298	.195	
	Size of land in acres	-.039	.188	-.026	-.206	.837	
	Land acreage for food production	.356	.249	.184	1.431	.154	
	Number of regular household members	.026	.151	.010	.172	.864	
	Main occupation	.057	.090	.038	.633	.527	
	Monthly income	.204	.088	.142	2.305	.022	

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Marital status of respondent	.037	.157	.014	.235	.815

a. Dependent Variable: Banana bunches produced seasonally

Source: Field Data

Table 7: Model Equation

Independent variables X_1 = Marital status X_2 = Occupation X_3 = Land size X_4 = Family size X_5 = Monthly income X_6 = Land acreage	
1.Model 1: Maize production	Terms
$f(x) = B_0+B_1 X_1+B_2X_2+B_3X_3+B_4X_4+B_5X_5+B_6X_6 + e_m$	B_0 = constant e = error
2. Model 2: Beans production	
$g(x) = K_0+K_1 X_1+K_2X_2+K_3X_3+K_4X_4+K_5X_5+K_6X_6 + e_b$	K_0 = constant e = error
3.Model 3: Banana Production	
$p(x) = a_0+a_1 X_1+a_2X_2+a_3X_3+a_4X_4+a_5X_5+a_6X_6 + e_b$	a_0 = constant e = error

Source: Field Data

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