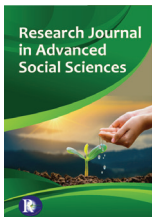

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Assessing the contributions and quality of various food crops harvested by household on food security in Ugenya Sub-County, Siaya County, Kenya

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Abstract
Demand for food and other agricultural products is projected to increase driven by population growth, increasing per capita incomes and changes in diets. Small scale food crop production in Kenya account for about 70 percent of the overall production. The purpose of this study was to investigate the effects of food crop farming on household food security in Ugenya sub-county, Siaya County, Kenya. This study adopted a descriptive research design, a target population of 2608 who include subsistence food crop farmers and experts from department of agriculture from which a sample size of 264 participants was selected. Questionnaires, and interview guide and direct observation were used to collect data. The data obtained from the questionnaire was edited, sorted and coded prior to analysis. The data was keyed into the Statistical Package for Social Sciences (SPSS) for analysis. Frequency and percentages was used to present data that required descriptive statistics. Regression analysis was used to analyze the extent of relationship between variables while data obtained through interviews was presented based on relevant themes. The study findings established that most of the farmers plant various kinds of food crops especially for household consumption this food crops included; maize, beans, sorghum, millet cassavas, potatoes and others.

Keywords: crop, food security, household, undernourishment, Ugenya

Public Interest Statement

The findings of this study will be useful to farmers in Ugenya Sub County in proposing how to improve food crop production. The county government of Siaya will benefit from the findings of this study since the study will provide practical ways of how to improve food crop production in the county so as to be food secure. Additionally, the findings of this study will help in formulating policies by the ministry of Agriculture and Devolution to improve food crop production. The research work and findings will also be used by other scholars as it will provide additional literature on food crop production and household food security.

1.0 Introduction

The high costs of farm operation have forced farmers to reduce the quality of seedbed preparation. Whereas in 1994, most food crop producers for example did two ploughs and two harrows to create a fine seedbed suitable for planting maize and wheat. In 1999 and 2018 seasons, most farmers had reduced the number of times they ploughed and harrowed thereby reducing the quality of the seed bed. Thorough land preparation normally involves deep ploughing and thorough removal of weeds and crop residues, row planting, correct placement of fertilizers through use of machinery; superior and thorough crop protection against weeds, and better harvesting operations due to use of machinery (Kang'ethe, and Lang'at, 2010). Reduction in the quality of land preparation thus could have adversely affected the yields and hence cause an increase in production costs per unit production. For example, maize yields in the country during the favorable weather conditions vary from 10 to 27 bags per acre (2.0 and 5.4 tons per hectare). Production levels and structure of production costs differ between the large and small production systems. Farm characteristics that make a significant impact on uptake of the improved maize varieties include hiring of labor and off-farm income. Hiring labor might not directly influence adoption of improved varieties, but it is a proxy for available cash to invest in agricultural production, (Wekesa *et al.*, 2003). From the time of planting until about a third of its life, maize is very susceptible to weed competition. Failure to weed during this critical period may reduce the yield by 20% (Bangun, 1999).

1.1 Research Objectives

The purpose of this study was to investigate the effects of food crop farming on household food security in Ugenya sub-county, Siaya County, Kenya.

1.2 Research Designs and Methods

The study adopted a descriptive research design. Descriptive research design is a scientific method which involves observing and describing the behavior of a subject without influencing it in any way (Kothari, 2014). Descriptive designs are most useful for describing phenomena or events about which little is known about them or for identifying. The design can be used for explaining or exploring the existing status of two or more variables at a given point in time. Descriptive design also enables the researcher to collect original data for the purposes of describing and measurement of characteristics of a population, which is too large to be observed directly. The design was considered appropriate as it will enable the researcher to reach many subjects within limited time (Kothari, 2014). Other features that make the research design useful for this study are: it involves the measurement of variance on the outcome variable relative to variance on the predictor variable(s), there was no manipulation of the variables or subjects under study; the study will be conducted in the subjects' natural environment, that is, with no pre-preparations .It is presumed that the outcome variable were determined to some extent by the predictor variables thus the study was draw conclusions based on the predictive levels of each of the predictor variables on the outcome variable (Creswell, 2012).

2.0 Literature Review

2.1Theoretical Framework

The entitlement approach to hunger discusses the ability of people to command food through the legal means available in the society. Entitlements are defined as the set of alternative commodity bundles that a person can command in a society using the totality of rights and opportunities that he or she faces (Young *et al.,* 2001). Sen's (1981) entitlement theory forms the conceptual basis of approaches of all agencies to assessing food security. Sen, (1981) introduced the idea of food security as a demand concern, where it is viewed in terms of entitlements, which influence capacity to access food. In this regard, the ability of households to access food either through production, purchase or transfers becomes important in defining household food security. Hence, household food security is a function of the availability of food within the country and the level of household resources that are necessary to produce or purchase food as well as other basic needs. Sen explained that famines occur not because there is not enough food, but because people do not have access to enough food. Of course the availability of food near to the household is a prerequisite of food security. Availability is influenced by factors such as community's proximity to centers of production and supply or market forces, restrictions on trade and international policies that affect food supplies. All of these are key to food security analysis. Entitlement theory has been criticized on two further counts. First it implies a straight forward sequence of entitlement failure leading to hunger and then to malnutrition, starvation and death. Second it implies that people's actions are largely determined by their need to consume food (De Waal, 1990).

An important extension to entitlement theory focuses on the role of investments in determining household vulnerability to food insecurity. When households are able to generate a surplus over and above their basic food requirements, the excess resources are diverted into assets of different kinds which can be drawn upon when they face crisis (Swift, 1989). In such circumstance we may relate food security to the idea of vulnerability to poor resource endowments of households, focusing more clearly on the risk where avoidance becomes central to attaining food security. Although the county governments in Kenya are mandated to ensure that enough food is produced and fed to its people, the residents of each county need to be empowered to access the food.

2.2 Type of crop farming and household food security

The most common food crops grown in most parts of the world include maize, sorghum, beans, groundnuts, cassava, potatoes and millet. Maize is the most important staple food crops in Kenya. It is estimated to contribute more than 25% of agricultural employment and 20% of total agricultural production (Government of Kenya, 2010). Despite the key role maize plays in food security and income generation, its productivity has not been adequate especially in the past four decades during which stagnation/decline in maize yield led to frequent food security problems. Ariga *et al.,* (2006) have attributed maize yield decline to two main reasons: (i) declining soil fertility and (ii) increase in world fertilizer prices (Omamo 2003; Xu, *et al,* 2006). The situation has been exacerbated by maize price fluctuation and occasional importation of cheap maize grains. The problem of declining maize yields is magnified by the fact that population continues to increase annually at a rate of about 2.9% leading to decreasing per capita consumption. The combined effect of increasing human population and poor maize yields on the country's capacity to feed the population is then accelerated annually (Government of Kenya, 2001; and 2004). The major contributory factors are soil degradation and low use of fertilizers. It has been proposed that soil nutrient mining is an important issue contributing to poor maize production in Kenya (De Jaeger *etal,* 1998).

Enhanced soil management has been recognized as crucial to soil fertility replenishment and enhanced agricultural productivity. Though important in soil fertility improvement it has be reported that, farmers typically apply inorganic fertilizers at rates well below recommended levels,

or not at all (Ariga et al., 2006). In a move to bolster production after a disputed presidential election that led to disruption of farm activities, NCPB imported fertilizer in 2008 but delivered it late which contributed to a poor crop. This in turn created pressure from some farmer lobby groups and activists for increased subsidization of inputs (fertilizer and seed) to raise productivity of maize to counter an expected increase in hunger in 2009. In 2009 the GoK imported substantial amounts of fertilizer through NCPB to be distributed through its branches and select private retailers at subsidized prices.

Given the prominence of maize in Kenyan agriculture (Pearson *et al*, 1995), returns to maize production as reflected in maize prices likely are an important influence on households' willingness to apply fertilizer. Indeed, Mose. Nyangito, and Mugunieri (1997) identified the maize: fertilizer price ratio as a significant determinant of fertilizer use on small farms in Kenya: the higher the ratio, the higher were fertilizer application rates among sampled farmers. The positive and significant relationship between maize prices and revenues from fertilizer sales confirms the dominant perception in Kenya of a positive correlation between the demand for fertilizer and returns to maize production.

In Zambia, Maize is the staple food and most small-scale farming households are engaged in maize production. Fertilizer is used predominantly on maize and agricultural marketing is dominated by maize sales among smallholders (Govereh *et al,* 2003). Improving maize productivity has been a major goal of the Zambian government to take care of tire increasing demand of food production.

Over 80% of smallholder farmers in Zambia own less than 5 hectares of land. Zambian government agricultural policy has for the past several decades focused on fertilizer subsidies and targeted credit programs to stimulate small farmers' agricultural productivity, enhance food security and ultimately reduce poverty. It is established that improvement of food security is one of the majors goals implemented to ensure meaningful poverty reduction in the world.

Agriculture in Nigeria, as in most other developing countries is dominated by small scale farm producers (Oladeebo, 2004). Education of farmers, farm size, extension agent contact, farm income, ability to predict rainfall, modem communication facilities, output of maize and mixed cropping combination with maize have positive influence on maize production. Olwande *et al,* (2009) posits that age, education, credit, presence of a cash crop, distance to fertilizer market and agro ecological potential 'significantly influenced maize production by smallholder farmers in Kenya. Wanyama *et al*, (2009) in Kenya showed that change agent (extension) visit to farmers, proportion of land under maize production, sex of household head, and agricultural training significantly affected likelihood of farmers adopting new technologies in maize production.

Groundnut (*Arachis hypogaea L*) is the 6th most important oil seed crop in the world. It contains 48-50% oil, 26-28% protein and 11-27% carbohydrates, minerals and vitamin (Mukhtar, 2009). Groundnut is grown on 26.4 million hectare worldwide, with a total production of 37.1 million metric tons and an average productivity of 1.4metric ton/ha. Developing countries constitute 97% of the global area and 94% of the global production of the groundnut (FAO, 2011). The production of groundnut is concentrated in the South East Asia and Africa, where food crops is grown mostly by small scale farmers in the rain-fed conditions with limited inputs.

In Nigeria, groundnut production has contributed immensely to the economic development. In 1956-1967, groundnut products including cakes and oil accounted from about 70% of total Nigeria export earnings, making it the country's most valuable single export crop ahead of other cash crops like the cotton, oil palm, cocoa and rubber (Harkness *et al.,* 1976).

In the present day Nigeria, it provides significant sources of cash through the sales of seeds, cakes, oil and haulms (Olorunju *et al.,* 1999). Given its high content of protein and carbohydrates, groundnut plays an important role in the diet of the populations especially the children. It is also rich in calcium, potassium, phosphorus, magnesium and vitamin E. Groundnut meal, a by-product of oil extraction, is an important ingredient in livestock feed. Groundnut haulms are nutritious and

widely used for feeding livestock. The groundnut oil is composed of mixed glycerides, and contain a high portion of unsaturated fatty acids, in particular Oleic (50-56%) and Linoleic (18- 30%) (Young, 1996). Groundnuts are also important in the confectionary trade and the stable oil is preferred by the deep frying industries since it has a smoke point of 229.4°C compared to 193.5°C of soya beans oil. The oil is also used to make margarine and mayonnaise (Hul, 1996). Confectionary products such as snack nuts, flour, peanut butter and cookies are made from high quality nuts of the crop.

According to Tara *et al.* (2008) groundnut requires 500mm to 1 600mm of rainfall, which may last for 70 to 200 days of a single season. Groundnut also requires well-drained light coloured loose friable sandy soil, with optimum moisture in pod-zole and mean daily temperature of about 30°C. Rainfall should be well distributed during pre-sowing operations, that is, 100mm to 150mm for sowing, and for flowering and pod-development the required rainfall is about 400mm-500mm. Groundnuts cannot withstand frost longer, as it can do for severe drought or water stagnation. However, the crop does best in sandy-loam and loamy soils, and in black soils with good drainage. Heavy and sticky clays are not suitable for groundnut cultivation because the pod development is hampered in these soils.

3.0 Results, findings and discussion

I visited all the sampled households and administered copies of questionnaire to the respondents and ensured that all the copies of questionnaire were properly filled and collected. Thus, the return rate for the farmers' questionnaire was 96.5 % (251), representing 141 male and 110 females. The actual sample size as shown by the return rate is presented in Table 1.0. Most males returned the questionnaire probably because there were more males as compared to their female counterparts in sampled wards.

Table 1.0: Return rate

Target group	Total population	Criteria	Study Sample size	Total returned Questionnaires	% return rate
House holds	2604	10% by Tuner	260	251	96.5%
Agricultural officer	4	Purposive	4	4	100%

Source: Field Data 2021

3.1 Cross tabulation of Age and marital status

Table 2.0 presents data of famer's age and their marital status

Table 2.0 Age (years). * Marital Status. Cross tabulation

Item		**Marital Status.**				**Total**
single		**married**	**widowed**	**divorced/ separated**		
Age (years).	20-35	0	16	8	0	24
	36-45	0	67	7	15	89
	46-60+	17	90	23	8	138
Total		17	173	38	23	251

Source: Field Data 2021

Table 2.0 presents that 24(9.6%) of the respondents were between 20-25 years of age and out of this

number, 16 (66.7%) were married while 8(33.3%) were widowed. Additionally, 89(%) of the farmers sampled were 36-45 years old. From this number also, 67(%) were married while 7(%) were widowed. Moreover, table 2.0 shows that 138(55.0%) of the sampled farmers were 46-60+ years of age.17 (12.3%) from the group of 46-60+ were single, 90(65.2%) were married, 23(17.7%) widowed while 8 (5.8 %) were divorced or separated. The data shows that majority of the respondents 138(55.0%) fall in the bracket of 46-60+ years of age. This indicates that the respondents were perhaps the owners of the various households that had been sampled by the researcher.

3.2 Age and sex of the respondents

Table 3.0 presents data on the age and sex of the respondents that participated in the study.

Count				
male		**Sex**		**Total**
		female		
Age (years).	20-35	24	0	24
	36-45	47	42	89
	46-60	70	68	138
Total		141	110	251

Table 3.0 Age (years). * sex Cross tabulation

Source: Field Data 2021

Table 3.0 presents that 141(56.2%) of the respondents were male while 110(43.8%) of respondents were female.24 (9.6%) of respondents were male of age 20-35 years while 89(35.5%) of the respondents were 36-45 years old. Table 3.0 also presents that 138(55.0%) of the respondents were above 46 years of age. This data implies that majority of the respondents 138(55.0%) were adults beyond the age of 46 years. As much as they are believed to be the owners of various families visited, they represent an aging workforce on the farms.

3.3 The age and Highest level of education

Table 4.0 presents data on the highest level of educational attainment of the respondents who participated in the study.

Table 4.0 Age (years). * Highest level of education. Cross tabulation

Count						
primary		**Highest level of education.**				**Total**
		adult education	secondary	Tertiary(Tvet/ collage/ University)		
Age (years).	20-35	8	0	8	8	24
	36-45	34	31	0	24	89
	46-60	67	26	37	8	138
Total		109	57	45	40	251

Source: Field Data 2021

The data in table 4.0 presents that that 8(3.2%) of the respondents attained primary education, 8(3.2%) attained secondary while 8(3.2%) attained tertiary education. Considering their tender age of 20-35 years, it can be revealed that, this a group of school or college dropouts. Among the young adults of 35-45 years, 34(13.5%) had attained primary education, 31(12.4%) went for adult education while 24(9.6%) had attained tertiary education. The fact that none of the respondents in the age bracket

of 35-45 years of age had attained secondary education shows that the largest population of the farmers may have attained low academic attainment. Additionally, Table 4.0 shows that 67(26.7%) of the respondents above the age of 46 had primary education while 26(%) went for adult learning, 37(14.7%) had secondary education and 8(3.2%) had tertiary education).

Table 4.0 shows that 109(43.4%) of the respondents attained primary education, 57(22.7%) Adult learning, 45(17.9%) secondary education and 40(15.9%) tertiary education. The implication of these results is that majority of the farmers lack higher educational qualifications. Those who participate in farming activities have some basic education 109(43.4%).This poses a challenge when it comes to adoption of new technology that requires higher training. Most of higher training may require that the candidate have a minimum qualification of secondary education yet only 45(17.9%) of the famers meet such requirements.

3.4 Types of food crops grown by farmers in Ugenya sub-county, Siaya County, Kenya.

In this section, data on the type of food crops produced is presented and discussed. Table 4.5 presents data on the types of food crops produced in Ugenya sub-county, Siaya County, Kenya.

Table 5.0 food crop produced

Food crop		**Frequency**	**%**
Valid	maize, beans	81	32.3
	Sorghum	50	19.9
	pigeon peas	23	9.2
	cassava and potatoes	61	24.3
	Other	36	14.3
	Total	251	100.0

Source: Field Data 2021

Table 5.0 presents that 81(32.3%) of the respondents stated that they cultivate maize and beans, 50(19.9%) produce sorghum while 23(9.2%) are engaged in pigeon peas farming. Additionally, 61(24.3%) of the farmers plant cassavas and potatoes while36 (14.3%) of the farmers plant other food crops. From the data in table 4.5,Majority of the farmers in Ugenya participate in mixed cropping since the data does not show one major food crop that may be planted by all farmers excluding other. Maize and beans however was the most preferred food crop as suggested by 81(32.3%) of the sampled farmers. This findings agrees with Government of Kenya (2010) and Nyoro *etal* (2004) who posits that maize is a stable food in Kenya and is grown by majority of farmers. Most of the farmers plant various kinds of food crops especially for household consumption. This explains why majority of farmers stated to have planted all the listed or majority of the food crops yet they did not have large pieces of land.

3.5 Quantity of food crops harvested

The quantity of various types of food harvested was presented as follows in table 4.6.

Table 6.0 Quantity of food crops harvested

Quantity (Kg) N % N		Maize		Beans		Sorghum		Other food crops	
		%	N	%	N	%			
Valid	No harvest	0	0.0	0	0.0	126	50.2	0	0.0
	less than 100kg	0	0.0	98	39.0	57	22.7	141	56.2
	100-200kg	88	35.1	48	19.1	27	10.8	86	34.3
	201-500kg	102	40.6	47	18.7	33	13.1	16	6.4
	above 500kg	61	24.3	58	23.1	8	3.2	8	3.2
	Total	251	100	251	100	251	100.0	251	100

Source: Field Data 2021

With a bag being 100kg, table 6.0 presents that 88(35.1%) of the farmers harvested an average of 1-2 bags of maize, 102(40.6%) harvested 2-5 bags, 61(24.3%) harvested more than 5 bags. As pertains beans, Table 6.0 presents that, 98(39.0%) harvested less than 1 bag,48(19.1%) harvested 1-2 bags,47(18.7%) harvested 2-5 bags while 58(23.1%) harvested more than 5bags.Additionally,table 6.0 presents that 126(50.1%) of farmers reported no sorghum harvest,57(22.7%) harvested less than 1 bag,27(10.8%) harvested 1-2 bags while 33(13.1%) harvested 2-5 bags. Those who reported to have harvested more than 5 bags of sorghum were 8(3.2%).Since most of farmers practice mixed cropping, table 6.0 presents that 141(56.2%) of farmers produced less than 1 bag in a year of other food crops,86(34.3%) produced 1-2 bags,16(6.4%) produced 25 bags while 8(3.2%) managed mare than 5 bags).

From the data in table 6.0, Ugenya sub county farmers do not produce surplus food to sell. The highest recorded harvest was 61(24.3%) of maize farmers who produced more than 5 bags in a year. This means that the food produced can be sold locally even at home, it may not reach the market. Additionally, 126(50.1%) of farmers reported no sorghum harvest in the year 2019.This indicated that they did not plant the crop in that year. The fact that they may have skipped 2019 or did not want to plant the crop may suggest that they plant food crop mainly for subsistence use. Having harvested the previous years what was enough for their consumption ay have not motivated the m to plan again or perhaps it is lack of market knowledge on availability of the market for the crop. From the data in table 4.6, the food crop production in in Ugenya Sub County remain low to cater for the entire population.

3.6 The contributions and quality of various food crops harvested by household in 2016-2019 on household food security in Ugenya sub-county, Siaya County, Kenya.

Table 4.7 presents data on how families in a given house hold utilizes the food that is product in their farms

Table 7.0 uses of food harvested

Use		Frequency	Percent
Valid	food in household	124	49.4
	feed and sold some	67	26.7
	sold all	60	23.9
	Total	251	100.0

Source: Field Data 2021

Table 7.0 presents that 124(49.4%) of the respondents consume all the food crops they harvest or produce in their farms.67(26.7%) sell part of their produce but consume the rest of the food crops harvested, while 60(23.9%) of the respondents sold all the food crops that they harvested from their farms. This meant that majority 191(76.1%) of the respondents depend on their farms for the supply of food crops. Only 60(23.9%) of the farmers who were engaged in farming activities as a business venture. The findings of this study are in agreement with Mbithi,(2000) who stated that 70% of food production is by small scale farmers who retain more that 58% of their produce for their consumption.

3.7 Food consumption for a household in a month

The consumption of various types of food by members of various household is provided in figure 4.8.

Table 8.0 Household food consumption

Days consumed in a month N		Cereals		Meat		Fruits	
		%	N	%	N	%	
Valid	Not consumed	8	3.2	115	45.8	16	6.4
	16-30days	64	25.5	24	9.6	91	36.3
	4-15days	117	46.6	68	27.1	36	14.3
	1-3 days	62	24.7	44	17.5	108	43.0
	Total	251	100.0	251	100.0	251	100.0

Source: Field Data 2021

Table 8.0 shows that 8(3.2%) had not consumed cereals for a month, 64(25.5%) consumed cereal products for 16-30 days.117 (46.6%) consume cereals for 4-15 days while those who consumed cereals for 1-3 days were 62(24.7%).meat consumption was as follows;115(45.8%) did not consume meet,24(9.6%) consumed mean for 16-30 days, 68(27.1%) consumed meat for 4-15 days while 44(17.5%) of the household consumed men for 1-3 days in a month. The researcher also sought to find out fruits intake by the families in a month.16 (6.4%) had not consumed fruit in the moth of study, 91(36.3%) had consumed fruits in 16-30 days, 36(14.3%) consumed fruits in 4-15 days while 108(43.0%) had consumed fruits in 1-3 days in a month. From the findings of the study, only 64(25.5%) of the respondents had consumed cereals which are great sources of carbohydrates every day or at least after every two days in a month. In this study, cereals composed of maize, rice, wheat or bread. The body requires must be given right amounts of diet. Also it is worth noting that the data reveals that an additional 117 (46.6%) consumed cereals for 4-15 days. This means that cereals was a staple food which the household depended on for survival. In this study, maize was one of the crops that was planted most 81(32.3%) from table 4.5.This meant that most of the household consumed the maize

that was produced by the farmers and argument that is supported by 124(49.4%) in table 7 who stated that they consumed the produced food crops.

On protein consumption, 115(45.8%) of the respondents stated that they did not consume meat at all in a month. Meat in this study comprised of high protein foods such as, red meat, fish, poultry, sardine and eggs. The body requires protein as well as other nutrients for survival. This means that the people had to find alternative sources of proteins and in this case legumes were found to be available. Tables 4.5 presented that the most produced 81(32.3%) food crops were the maize and beans. Since most of the food crops is consumed 124(49.4%) in table 7 by farmers, dried beans were heavily relied upon to supplement the meat in their diet.

If the results of those who did not fruits is combined with those who took it only in 1-3 days in Table 8.0 we get 124(49.4%).This presents the number of people who had not taken a fruit or had it in 1-3 days in a month. Fruits in this study consisted of bananas, mangoes, oranges, and other locally available fruits. Lack of enough fruits in the diet implied that the farmers were not able to access them due to lack ability. Ugenya being largely remote and faming being practiced there, farmers were then deemed to be poor. The findings from this results (table 8) points to the families who could not feed themselves with the right amount of nutrition intake hence dire situation. The finding contradicts UNSC, (2010) which stated that one of the component being to access food and utilization/ consumption, this entails, having adequate dietary intake and the ability to absorb and use the nutrients in the body.

4.0 Conclusion

The findings of the study showed that majority of the Ugenya residents depended on food crops that were produced in their farm for feeding or produced by their neighbours. It was also noted that not all the farmers planted food for consumption, they however farmers, 60(23.9%) ,table 4.7 participated in crop farming as a business venture. Cereals were the most consumed food crops in many house hold. 117 (46.6%) consumed cereals for 4-15 days. This means that cereals was a staple food which the household depended on for survival. This meant that most of the household consumed the maize that was produced by the farmers and argument that is supported by 124(49.4%) in table 4.7 who stated that they consumed the produced food crops. Legumes were the most consumed food as accessible protein. In this study it was established that majority 115(45.8%) could not afford to consume meat at all in a month. Meat in this study comprised of high protein foods such as, red meat, fish, poultry, sardine and eggs. This means that beans that were produced in the farms were consumed by majority of the households.

Recommendations

Based on the findings of the study, the following recommendations were made**:** The consumption of food in right quality and amount is key in addressing food security in Ugenya Sub County. To succeed in this goal, more food crops must be made available to the consumers. Farmers need incentives from both national and county governments to produce more as well as good prices for their produce so as to have food in plenty being sold.

References

Achonga, B., Akuja, T., Kimatu, J. and Lagat, J. (2017): *Implications of Crop and Livestock Enterprise Diversity on Household Food Security and Farm Incomes in the sub Saharan region*, Global Journal of Biology, Agriculture & Health Sciences,Vol.4(2)

Adebayo O. (2012). *Effects of Family Size on Household Food Security in Osun State, Nigeria*, Asian Journal of Agriculture and Rural Development, Vol. 2, No. 2, pp. 136-141.

Barongo D.(2013).*Factors affecting household food security: a case study of Mtwara rural district-Mtwara region, South Africa.*

Creswell, J. (2012). Educational research: Planning, conducting, and evaluating quantitative and qualitative research (4th ed.). Boston, MA: Pearson.

De Waal, A. (1990). A Re- assessment of Entitlement Theory in the Light of the Recent Famines in Africa. *Development and Change*, 21(3), 469-490.Dimensions of Food Security." Food and Agriculture Organisation, Rome

Epule E., Bryant R. (2017). *The adoption of Agroecology and conventional farming techniques varies with socio-demographic characteristics of small-scale farmers in the Fako and Meme divisions of Cameroon*. *Geo Journal* 82, 1145–1164.

FAO STATISTICS. (2013). *Maize Production Trend in Kenya 1960-2011;*

FAO STATISTICS. (2013). *Maize Production Trend in Kenya 1960-2011; Ukwala Division, Ugenya*. http://www.factfish.com/statistic country/kenya/maize,+total,++production+quantity

FAO, IFAD, UNICEF, WFP and WHO. (2019). The State of Food Security and Nutrition in the World 2019.Building resilience for peace and food security. Rome.

FAO, IFAD, WFP (2018): *The State of Food Insecurity in the World. The Multiple*

FAO. (2012). *Monitoring African Food and Agriculture Policies (MAFAP*)

FAO. (2017). The Future of Food and Agriculture: Trends and Challenges. Rome.

FAO. (2019). *The State of Food and Agriculture in the World 2019. Leveraging food systems for inclusive rural transformation*. Rome.

FSR (Food Security Report). (2017). Prepared by Kenya Agricultural Research.

Gabre-Madhin, E.Z. and S. Haggblade.(2001). *Success in African Agriculture: Results of an Expert Survey.* International Food Policy Research Institute. Washington DC.

Government of Kenya (2010). *Agricultural Sector Development Strategy*. Nairobi: Kenya

Government of Kenya (2012). *Ministry of Agriculture - BBS/ PAPOLD Reports 2005-2011*

Government of Kenya (2013). *Department of Agriculture, Annual Report 2013-Siaya County*

Government of Kenya (2013). *Ministry of Agriculture - NAAIAP/ Progress Report*

Government of Kenya (2013). *Siaya County Integrated Development Plan 2013-2017*

Government of Kenya (2014). *Food Security Report, Kenya Agricultural Research* Institute.http://www.foodsecurityportal.org/kenya/food-security-report-prepared-kenya-agriculturalresearch-institute

Government of Kenya (2014). *Siaya County Integrated Development Plan*. Nairobi: Kenya Government Printers.

Government of Kenya. (2003). Ministry of Agriculture - The Kenya CAADP Compact

Government of Kenya. (2004). *Ministry of Agriculture, Kenya Strategy for Revitalizing Agriculture (2004-2014),* Nairobi: Kenya Government Printers.

Government of Kenya. (2007). *Kenya Vision 2030. Nairobi*: Kenya Government Printers.

Government of Kenya. (2009). *KNBS-Population census of 2009*. Kenya Government Printers

Government of Kenya. (2009). *KNBS-Population census of 2009*. Kenya Government Printers Government Printers.

http://www.factfish.com/statistic-country/kenya/maize,+total,++production+quantity

Humanities Social Sciences and Education. 2(2) 63-76.

Icheria B.K (2017). Household Food Insecurity and Coping Strategies among Small
Institute, Food Security Portal.

Johnson, R. & Onwuegbuzie, Anthony & Turner, Lisa. (2007). *Toward a Definition of Mixed Methods Research.* Journal of Mixed Methods Research, 1, 112-133. Journal of Mixed Methods Research. 1. 112 -133. 10.1177/1558689806298224

Kang'ethe, E. and Lang'at, A. (2010) *An investigation of Aflatoxin B1 and M1contamination of animal feeds and milk from urban centers in Kenya*. African Health Sciences; 9(4): 218-226

Kanyamurwa J.,Wamala S., Baryamutuma R., Kabwama E. and Loewenson R.(2013). *Differential returns from globalization to women smallholder coffee and food producers in rural Uganda.African* Journals Online. Vol. 13 No. 3

KNBS.(2019). *2019 Kenya Population and Housing Census*: Volume II.Government printers.Nairobi

Kothari C.(2014),*Research Methodology,* Third Edition,New Age International Publishers, New Delhi

Kumba J.(2015). *The Role of Household Characteristics in Determining Food Security in Kisii Central Sub-County, Kenya*. Research on Humanities and Social Sciences.

Langat B., NgénoV., SuloT., Nyangweso P., Korir M., Kipsat, M. and Kebenei J. (2012) *Household food security in a commercialized subsistence economy: A case of smallholder tea famers in Nandi south district, Kenya.* Journal of Development and Agricultural Economics

Nassiuma, D.K. (2000). Survey Sampling: Theory and Methods. University of Nairobi Press.

Nyoro K.(2000). *Kenya competiveness in Maize production:Implications for food security.Tegemeo Institute ,Egerton University,Kenya.* Scale Farmers in Tharaka Central Division, Kenya.

Schutjer and Van Der Veen(1999) Economic Constraints on Agricultural *...being the slope of the probability density function.*

Sell M. and Minot N. (2018). *What factors explain women's empowerment? Decision-making among small-scale farmers in Uganda*, Women's Studies International Forum, Vol. 71, Pages 46-55,

Sen, A. (1981). *Poverty and Famines: an Essay on Entitlement and Deprivation*,Oxford: Clarendon Press

Swift, J. (1989). *Why are rural households' people vulnerable to famine?* IDSBulletin 20 (2), Institute of Development Studies, University of Sussex,Brighton, UK.

URT, (2016). *Poverty and Human Development Report 2007. Research and Analysis Working Group,* MKUKUTA Monitoring System, Ministry of Planning, Economy and Empowerment, published by Research on Poverty Alleviation (REPOA) Dar es Salaam, Tanzania

URT, (2017). *Research and Analysis Working Group, 'Poverty and Human Development Report 2017'.* Ministry of Finance and Economic Affairs. Dares Salaam, Tanzania.

Wambua, B., Omoke, K. and Mutua, T. (2014). *Effects of Socio-Economic Factors on Food Security Situation in Kenyan Dry Lands Ecosystem*. Asian Journal of Agriculture and Food Science 2: 51 – 59.

Wekesa, E. 2003. "*Adoption of Maize Production Technologies in the Coastal Lowlands of Kenya*," *Miscellaneous Reports* 56109, CIMMYT: International Maize and Wheat Improvement *Center.*

WHO. (2012). *WHO Global Database on Child Growth and Malnutrition. Geneva, Switzerland, World Health Organization*. http://www.who.int/nutgrowthdb/en/. (Accessed 20 April 2012.)

Young, H., Jaspars, S. Brown, R., Frize, J. and Khogali, H. (2001). *Food insecurity assessment in emergencies:* A livelihood approach. Westminster Bridge Road London United Kingdom.