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Evaluation of the Utilization of Finger Millet and Sorghum for Enhancing Food Security in Selected Sub Counties of Bungoma and Busia, Kenya

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Abstract

Despite favorable climatic conditions for agriculture in western Kenya, millions of households have insufficient access to nutritionally safe food. The poverty indices are also high ranging from 44.3% in Bungoma County to 65.0% in Busia County according to the Economic Survey of 2019. While the national and county governments largely focus on large-scale production of maize as a staple food crop, the production of climate resilient and highly nutritious indigenous cereal food crops like finger millet and sorghum is on the decline both in area and yields per unit land. This paper is premised on the findings of a study which sought to assess the potential of finger millet and sorghum on food security in Bungoma Central Sub County (Bungoma County) and Teso North Sub County (Busia County), Kenya. A descriptive survey study design was employed to study the target population. The study targeted 2772 respondents including household heads, agricultural officers, CBO leaders from Bungoma Central and North Teso Sub Counties. The study sample was 306 respondents. These respondents were sampled using random sampling for household heads and purposive sampling for key informants respectively. Face to face interview, structured questionnaires and observation was employed as tools of data collection. Quantitative data was analyzed using SPSS Ver 22 statistical software and were in terms of frequencies and percentages. Qualitative data was analyzed thematically as by the objective. Data presentation was by use of tables, pie charts, bar charts. In the results, the model was found to be significant and therefore the null hypothesis was rejected on the ground that factors affecting utilization of finger millet and sorghum had significant and relatively weak and positive linear correlation with food security. Findings reveals that the relationship of factors affecting utilization of finger millet and sorghum and Food security variables which was linear, positive and significant. In light of the objectives and findings, the following recommendations suffice: Create awareness on the benefits of sorghum and millet. This awareness should include all learning institutions as part of the syllabus. There is also need for promotion of cost-effective climate resilient technologies. In addition, Government should subsidize

production inputs of sorghum and millet, Government should organize for collective marketing for sorghum and millet.

Keywords: Finger millet, sorghum, Bungoma, Busia, food security, agriculture, poverty

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Introduction

Background information

As the understanding of food security has evolved, so has its definition by different authors. For example, the definition derived from the World Bank conference of 1974 laid emphasis on food supply and focused mainly on food availability and stable food prices. Since then, however, the definition has shifted to include multidimensional concepts such as food accessibility, food utilization and food stability; as well as bringing in the importance of households and individuals in food security concerns. Writers such as Sen (2011) have dominated this debate, raising the issue of entitlement. The debate has resulted in the shift from global and national concerns to individuals and households. In 1983, FAO modified its definition of food security thus: "Ensuring that all people at all times have both physical and economic access to the basic food they need" (FAO, 2013). FAO (2013) estimates that a total of 842 million people, or around one in eight people in the world, suffered from chronic hunger between 2011 and 2013, meaning they were regularly not getting enough food to conduct an active life. This figure shows a 3.08 per cent reduction in the level of hunger reported by FAO in 2011–12, when 868 million people were estimated to be undernourished. It is important to note that there have been marked regional differences in this improvement in nutrition or food security.

Western Asia shows no progress, while Southern Asia and Northern Africa show slow progress. Many countries still struggle to meet the ambiguous food security goals of: the World Food Summit (WFS) of 1996, whose target was halving the number of hungry people in the world (FAO, 1996); the 2015 Sustainable Development Goals (SDG) whose goal is to harness agriculture as a strategic actor for sustainable economies; African Union Agenda 63 of alleviating poverty through embracing diversified agricultural practices; and the Kenya Vision 2030 whose agriculture pillar is more about sustainable agribusiness. Although many countries still struggle to meet these targets, on 12 June 2013, FAO reported that 38 countries had already met

internationally established targets in the fight against hunger, chalking up success ahead of established deadline of 2015 (FAO, 2014). An additional 18 countries were congratulated on achieving both Millennium Development Goals (MDG) 1 and the stricter WFS goal, having halved the absolute number of undernourished people between 1990–92 and 2010–2012. This is a positive indication that international food security targets are being achieved, and if other countries meet their commitments, it is possible that food security in Africa would improve steadily.

Sorghum and millets can contribute to food security, the eradication of hunger and poverty, as well as the prevention of diseases in Africa (Mbhenyane, 2016). There is sufficient evidence from studies from Africa and the rest of the world that sorghum and millets are consumed by many households, especially in areas where they are available, and thus can play an important role in alleviating food insecurity. Many rural communities have access to traditional crops that are rich in micronutrients, which are likely to serve as a long-term strategy to eliminate food insecurity. The diversity of indigenous crops has the potential to augment the nutrient composition of family diets and may contribute to household food security and the alleviation of hidden hunger which is a result of a lack of dietary diversity, usually linked to poor consumption of fruit and vegetables in general. Underutilized indigenous crops provide an opportunity for incorporation of alternative food sources into rural food systems. According to the Sustainable Development Goals (SDGs), agriculture is a key facet of enhancing sustainability in both growing and grown economies and nations that diversify their agricultural practices are sure to enjoy sustainability in due course.

Sub-Saharan Africa remains the region with the highest prevalence of undernourishment, with modest progress in recent years. According to Mbhenyane (2016), in a study on sorghum and millet and its potential to enhance sustainable development in Africa using multiple regression analysis, food insecurity is a major issue in developing countries, including South Africa where it can lead to hunger, malnutrition, negative effects on health and quality of life, and impacts on social and economic development. South Africa is one of the few African countries that have been embedded in the global agro-industrial food system for decades. Despite this consolidation, South African food prices remain too high for the majority of her people, who, consequently, cannot afford to purchase adequate food, leaving 21.3% of the population with poor access to food. Furthermore, the concerns regarding environmental degradation, loss of biodiversity, and vulnerability to climate change, have prompted a call to rethink the current configuration of the South African food system. A focus on reinvigorating underutilized indigenous and traditional crops, and bringing these to the market, has been suggested as an entry point for improving diets and making them more sustainable. Sorghum and millet are popular among the elderly and the people with lifestyle diseases because of its nutritional value towards enhancing balanced diets compared to maize whose nutritional value cannot be compared to the above two.

The sorghum bran is low in protein and ash and rich in fibre components. The germ fraction in sorghum is rich in ash, protein and oil but very poor in starch. Over 68 percent of the total mineral matter and 75 percent of the oil of the whole kernel is located in the germ fraction. Its contribution to the kernel protein is only 15 percent. Sorghum germ is also rich in B-complex vitamins. Endosperm, the largest part of the kernel, is relatively poor in mineral matter, ash and oil content. It is, however, a major contributor to the kernel's protein (80

percent), starch (94 percent) and B-complex vitamins (50 to 75 percent). The pearl millet bran is low in mineral matter like that of sorghum, but it is remarkably rich in protein (17.1 percent). The germ fraction in pearl millet is relatively large, 16 percent as against 10 percent in sorghum. It is also rich in oil (32 percent), protein (19 percent) and ash (10.4 percent). Practically, all the oil (87 percent) of the whole kernel is in the germ fraction, which also accounts for over 72 percent of the total mineral matter. Greater concentration of minerals in the germ and the bran layers than in endosperm is typical of cereal grains (Mgonja et al., 2013). The total fat content of pearl millet is higher than that of other millets and sorghum because of the size of the germ and its high oil content and because of somewhat higher levels of fat in the bran fraction (Shewry & Hey, 2015).

In the Kenyan situation, the African Union (AU) Agenda 63 puts clear emphasis on diversifying agricultural activities. Nations are encouraged to move away from conventional staple foods which may be facing the danger of residual production and embrace quick wins that are resistant to the ongoing global climatic uncertainties. In a bid to enhance national food security and sufficiency through improved production, the Kenyan government - through the Kenyan Vision 2030 and specifically its Strategy for Revitalizing Agriculture (Kenya MoA and Ministry of Livestock and Fisheries Development, 2014) - decided to promote production of traditional food crops, especially in the dry areas. It began by training farmers in these areas to produce quality seed, as lack of quality seeds is a major bottleneck in the production of traditional food crops (Muthoni & Nyamongo, 2018; Kenya MoA, 2017). The Kenyan government also distributed seeds and planting materials worth about KES 650 million to farmers in most parts of the country (Kenya Agricultural Research Institute [KARI], 2018). The traditional food crops seed distribution program targeted about 25,000 farmers (Orengo, 2019); planting materials were distributed for crops such as cassava, sweet potato, cowpeas, sorghum, finger millet, pigeon peas, chickpeas, and common bean (KARI, 2018). These crops are known to perform well in dry areas where food insecurity is a common feature (KARI, 2018). The Government Big Four Agenda has also put weight on agriculture as a strategic pillar in ensuring a stable economy for the Kenyan people.

KARI has been undertaking research to improve the productivity of traditional food crops in Kenya. Research to improve yield, taste, adaptability to drought and heat stresses, as well as tolerance to pests and diseases, has been going on for a long time in various KARI Centers (KARI, 2019). In recent years, production and consumption of traditional leafy vegetables has increased due to heightened awareness of their good nutritive value and promotion by a number of key players such as KARI, the Kenya MoA, and non-governmental organizations such as Family Concern International and the Rural Outreach Programme (Mbugua, Nyamongo & Silingi, 2010). It is not clear to opine the influence of sorghum and millet as indigenous foods on food security especially with the limited literature conducted in Kenya and Bungoma and Busia on the subject matter. This gap necessitates a current study to mitigate it. This study endeavored to investigate the potential of tradition food crops on promoting food security.

Statement of the problem

The World Summit on Food Security has a target of 70% more food production by 2050, requiring annual increases of 44 million tons, 38% above current annual increases (FAO, 2018). In Kenya, the current annual increase is placed at 29 million tons and the government is putting in place measures to attain this proposed global standard (KARI, 2019). However, the

frequency and increased intensity of extreme climatic events such as drought have become additional challenges for global agriculture, which is already facing higher demand due to both population increase and new consumption habits. Sorghum and Finger millet has the potential to meet these challenges, given their drought tolerance and ability to grow under low input conditions. Despite many factors weighing in Kenya's favor on the agricultural front, millions of households have insufficient access to nutritionally safe food (Mbugua, Nyamongo & Silingi, 2010). This is largely a function of poverty, which is particularly pervasive in the rural areas. While the government's largely unsuccessful agricultural development programs have focused on large-scale crops production such as wheat and maize, indigenous and traditional food crops could play a significant role due to their drought resistance and quick harvest periods. More recently, the Kenyan National Health and Nutrition Examination Survey (KNHN) reported only 45.6% of the Kenyan population to be food secure. The largest percentage of participants who experienced food insecurity was found in urban informal (32.4%) and rural formal (37.0%) localities (KNHN, 2018). Bungoma and Busia counties were found to have favorable climatic conditions for food crop production yet the potential was minimally utilized. Addressing food insecurity requires policies that acknowledge the potential nutritive value of indigenous foods, especially those harvested in impoverished communities. Reports further reveal that the use of indigenous foods to meet people's all needs has declined due its non-availability in modern and industrialized markets and a lack of investment in research and development. Available reports show contradicting findings; for example, FAO (2013) reported that indigenous foods of leafy vegetables and traditional cereals have the potential to foster food security by alleviating poverty in Europe, while the studies by Adeboye (2014) in Western Nigeria and James (2017) in Central Kenya showed that millet and sorghum has minimal consumption habits in the region and thus has little chances of reducing food insecurity. This contradiction necessitates an independent study to validate these findings. Furthermore, most of the reviewed studies were neither conducted in Bungoma nor Busia counties. This study focused to asses factors affecting utilization of finger millet and sorghum in Bungoma Central Sub County, Bungoma County and Teso North Sub County, Busia County, Kenya.

Hypothesis and justification

The study was guided by the following null hypotheses;

> $H_{O1:}$ *There are no significant factors affecting utilization of finger millet and sorghum on food security in Bungoma Central sub county, Bungoma County and Teso North Sub County, Busia County Kenya*

Many countries have not given traditional food crops serious attention accorded to other food crops aiming at alleviating hunger and food insecurity, besides relative neglect of the consequences arising out of food insecurity. There is also no reliable population-based data available about consumption and marketing of traditional food crops in Kenyan communities. Due to inadequate information available in the public domain on potential of traditional food crops many communities have neglected it and most of such crops are fading away. By providing data on the potential of traditional crops on fostering food security, policy makers will be in a position to develop sustainable strategies and intervention to counter food insecurity.

The data will also aid in developing a national traditional food policy to protect the

producers, dealers, consumers and families against exploitation. Community Based Organizations (CBOs) and Non-Governmental Organizations (NGOs) will also benefit from the study in their efforts of service provision to the community. The study will also guide the agricultural stakeholders in the area of utilizing traditional food crops and enhancing household food security through its recommendations.

Literature review

Factors influencing the utilization of finger millet and sorghum for food security

Sorghum and millets are staples and specialty health foods, with significant potential for urban consumers seeking convenience, taste, and nutritional value at an affordable price (KARI, 2018). However, challenges arise when poor-quality grains, prevalent in regular markets, are used in production, resulting in subpar products unable to compete with alternatives like rice. Government policies, such as subsidies on wheat flour, further hinder the utilization of local cereals by making imported products more economically viable (KARI, 2018).

Important food applications of sorghum and finger millet encompass a wide range, including various breads, porridges, noodles, and beverages across different cultures (Scarff, 2017). Their processing potential is comparable to maize, with the added advantage of being inherently gluten-free, catering to individuals with celiac disease (Scarff, 2017). Beyond human consumption, sorghum and finger millet offer diverse uses, from forage and animal feed to industrial applications like biofuels and adhesives (NRC, 2016).

Despite excellent processing qualities, achieving consistent quality grain supply remains a challenge, particularly for upscale urban products. Progress in West Africa demonstrates the potential for effective supply chains to drive profitability, evidenced by successful ventures like yogurt containing pearl millet (NRC, 2016). In South Africa, despite taxes on processed sorghum products, consumer demand persists for high-quality local grains, encouraging investment in cleaning facilities to meet market expectations (Greenwood, 2021).

Research indicates evolving sources of information on sorghum and finger millet utilization, with printed media retaining significance while professional sources like consultants and research institutions gain prominence (Slavic, 2004). Horizontal transfer of information between similar farms remains key, highlighting the importance of knowledge exchange within agricultural communities.

While studies acknowledge the various uses of sorghum and millet domestically and commercially, their role as alternative staple foods remains undefined. Therefore, addressing these gaps is key to understanding their full potential in contributing to food security.

Conceptual framework

The conceptual framework (Figure 1) shows the relationship between the utilization of finger millet and sorghum on food security in Bungoma Central Sub County, Bungoma County and Teso North Sub County, Busia County. The study independent variable is the utilization levels of sorghum and finger millet. Food security was the dependent variable and was measured by hunger and starvation cases, meals consumed per day and diet. Production was measured by yield level, acreage of farm. Utilization was measured by industrial purposes, domestic consumption. Marketing was measured by small scale marketing and large-scale marketing. Government policy and social cultural factors were the intervening variables. This conceptual framework is also linked to the theoretical framework of this study.

According to Bandura and Walters (1977), who proposed this theory, change in behavior could be observed to occur without being connected to a specific trend of positive or negative influence.

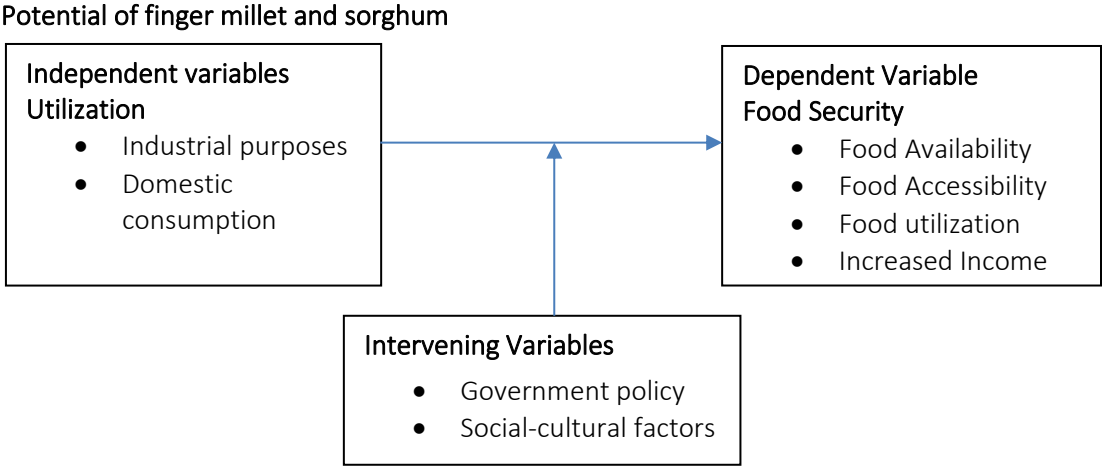

Figure 1: Conceptual framework

Materials and methods

A descriptive survey study design was employed to study the target population. The study targeted 2772 respondents including household heads, agricultural officers, CBO leaders from Bungoma Central and North Teso Sub Counties. The study sample was 306 respondents. This sample was arrived at by sampling 10% of the study population of 2772 to get 278 plus 10% of the study sample to cater for non-return which is 28. These respondents were sampled using random sampling for household heads and purposive sampling for key informants respectively. Face to face interview, structured questionnaires and observation was employed as tools of data collection. Quantitative data was analyzed using SPSS ver 22 and were in terms of frequencies and percentages. Qualitative data was analyzed thematically as by the objectives. Data presentation was by use of tables, pie charts, bar charts.

Results and discussion

Descriptive statistics results for finger millet and sorghum utilization in Bungoma Central Sub County

Results on the rate of Sorghum and finger millet utilization in Bungoma Central Sub County are presented in table 1 below.

As illustrated in table 1, on whether most of their sorghum and millet are consumed domestically for food needs, 26.6% strongly agreed, 16.7% agreed, 10% was not sure, 26.6% disagreed, 13.3%strongly disagreed. Therefore, majority of the household heads generally agreed that most of their sorghum and millet are consumed domestically for food needs.

On whether most of our sorghum and millet are used for industrial commercial needs 0% strongly agreed, 3.3% agreed, 10% were undecided, 20.0% disagreed, 26.3% strongly disagreed. Therefore, majority 66.6% of the household heads generally disagreed that most of their sorghum and millet are used for industrial commercial needs.

Table 1: Sorghum and finger millet utilization in Bungoma Central Sub County

	Utilization	5	4	3	2	1
1	Most of our sorghum and millet are consumed domestically for food needs	26.6%	16.7%	10%	26.6%	13.3%
2	Most of our sorghum and millet are used for industrial commercial needs	0%	3.3%	10%	20%	26.3%
3	Most of our sorghum and millet are consumed both domestically as well as for industrial purposes	26.6%	16.7%	10%	26.6%	13.3%
4	Sorghum and millet can be our staple food	26.6%	16.7%	10%	26.6%	13.3%
5	Sorghum and millet have alot of nutrition value to the human body	26.6%	16.7%	10%	26.6%	13.3%

Key: *5 = Strongly Agree (SA); 4 = Agree (A); 3 = Undecided (U); 2 = Disagree (D); 1 = Strongly Disagree (FS)*

On whether most of their sorghum and millet are consumed both domestically as well as for industrial purposes, 26.6% strongly agreed, 16.7% agreed, 10% was not sure, 26.6% disagreed, 13.3% strongly disagreed. Therefore, majority of the household heads generally agreed that most of their sorghum and millet are consumed both domestically as well as for industrial purposes.

On whether sorghum and millet can be their staple food, 26.6% strongly agreed, 16.7% agreed, 10% was not sure, 26.6% disagreed, 13.3% strongly disagreed. Therefore, majority of the household heads generally agreed that sorghum and millet can be our staple food.

On whether sorghum and millet have alot of nutrition value to the human body, 26.6% strongly agreed, 16.7%agreed, 10% was not sure, 26.6% disagreed, 13.3%strongly disagreed. Therefore, majority of the household heads generally agreed that sorghum and millet have alot of nutrition value to the human body.

Descriptive statistics results for utilization of finger millet and sorghum in North Teso

On whether most of their sorghum and millet are consumed domestically for food needs, 16.6% strongly agreed, 26.7% agreed, 10% was not sure, 26.6% disagreed, 13.3%strongly disagreed. Therefore, majority of the household heads generally agreed that most of their sorghum and millet are consumed domestically for food needs.

On whether most of our sorghum and millet are used for industrial commercial needs 0% strongly agreed, 2.3% agreed, 11% were undecided, 26.0% disagreed, 20.3% strongly disagreed. Therefore, majority 66.6%of the household heads generally disagreed that Most of their sorghum and millet are used for industrial commercial needs

On whether most of their sorghum and millet are consumed both domestically as well as for industrial purposes, 25.6% strongly agreed, 17.7% agreed, 16% was not sure, 20.6% disagreed, 13.3% strongly disagreed. Therefore, majority of the household heads generally agreed that most of their sorghum and millet are consumed both domestically as well as for industrial purposes.

On whether Sorghum and millet can be their staple food, 27.6% strongly agreed, 15.7% agreed, 10% was not sure, 26.6% disagreed, 13.3% strongly disagreed. Therefore, majority of the household heads generally agreed that sorghum and millet can be our staple food.

On whether sorghum and millet have alot of nutrition value to the human body, 25.6% strongly agreed, 17.7%agreed, 16% was not sure, 20.6% disagreed, 13.3%strongly disagreed. Therefore, majority of the household heads generally agreed that sorghum and millet have alot of nutrition value to the human body. Table 2 presents these results.

Table 2: Utilization of sorghum and finger millet in North Teso Sub County

	Utilization	5	4	3	2	1
1	Most of our sorghum and millet are consumed domestically for food needs	16.6%	26.7%	10%	26.6%	13.3%
2	Most of our sorghum and millet are used for industrial commercial needs	0%	2.3%	11%	26%	20.3%
3	Most of our sorghum and millet are consumed both domestically as well as for industrial purposes	25.6%	17.7%	16%	20.6%	13.3%
4	Sorghum and millet can be our staple food	27.6%	15.7%	10%	26.6%	13.3%
5	Sorghum and millet have alot of nutrition value to the human body	25.6%	17.7%	16%	20.6%	13.3%

Key: 5 = *Strongly Agree (SA); 4 = Agree (A); 3 = Undecided (U); 2 = Disagree (D); 1 = Strongly Disagree (FS)*

Inferential statistics on factors affecting utilization of finger millet and sorghum and food security

The means of factors affecting utilization of finger millet and sorghum and food security were regressed. The purpose of this analysis was to find the relationship between Factors affecting utilization of finger millet and sorghum and Food security. This aided in testing the second hypothesis of the study that posits, $H_0$2: factors affecting utilization of finger millet and sorghum has no statistically significant effect on food security. This was tested using significance of R square and Regression coefficient at 95.0% confidence level. Table 3 shows the results.

Table 3: Regression results of factors affecting utilization of finger millet and sorghum and food security

Model Summary [c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change statistics				
					R Square change	F change	df1	df2	Sig. F change
1	0.470[a]	0.221	0.219	0.78899	0.221	95.821	1	120	.000

a. a. Predictors: (Constant), Factors affecting utilization of finger millet and sorghum
b. c. Dependent Variable: Food security

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	59.649	1	59.649	95.821	.000[b]
	Residual	210.407	120	0.623		
	Total	270.056	121			

a. Dependent Variable: Food security
c. b. Predictors: (Constant), Factors affecting utilization of finger millet and sorghum

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations		
		B	S.E.	Beta			Zero order	Partial	Part
1	(Constant)	2.322	0.145		16.000	0.000			
	Factors affecting utilization of finger millet and sorghum	1.384	0.039	0.470	9.789	0.000	0.470	0.470	0.470

a. Dependent Variable: Food security

b. Predictors: (Constant), Factors affecting utilization of finger millet and sorghum

Factors affecting utilization of finger millet and sorghum

Table 3 reveals that the relationship of factors affecting utilization of finger millet and sorghum and food security variables which was linear, positive and significant. The correlation coefficient (R) of 0.470 implied a relatively positive relationship of factors affecting utilization of finger millet and sorghum and Food security. The coefficient of determination, R-square of 0.221 implied that 22.1% of the variance in Food security was accounted for by factors affecting utilization of finger millet and sorghum with the significance value of p = 0.000 which is less than 0.05. The unstandardized regression coefficient (β) value of Factors affecting utilization of finger millet and sorghum and food security was 0.384, correlation coefficient (β) of 0.470 and with a t-test of 9.789 and significance level of p = 0.000, which further confirmed existence of a significant and relatively weak positive linear correlation of factors affecting utilization of finger millet and sorghum and food security.

This indicated that a unit change in Factors affecting utilization of finger millet and sorghum would result to change in food security by 1.384 in the same direction. At 5% level of significance and 95% level of confidence, factors affecting utilization of finger millet and sorghum were significant in predicating the degree of food security. The regression equation to estimate the degree of food security is stated as:

$$FS = 2.322 + 1.384FAU$$

An F-significance value of p = 0.000 was established showing that there was a probability of 0.00% from the regression model to accept the null hypothesis. The hypothesis, $H_0 1$, stated that: factors affecting utilization of finger millet and sorghum have no significant effect on food security. Thus, the model was found significant and therefore the null hypothesis was rejected on the ground that factors affecting utilization of finger millet and sorghum had significant and relatively weak and positive linear correlation with food security. The research hypothesis was tested using the significance level of both the R^2 and regression coefficients at 0.05.

The above findings are supported by previous studies. For instance, Odendo and De Groote (2006) studied grain utilization and marketing information for farmers in surplus and deficit zones in western Kenya. The study analyzed the utility and reliability of the sources of marketing information and farmers' perception of the importance of marketing information. They found out that about three quarters of the farmers both in surplus and deficit zones used sorghum for domestic over commercial purposes. The farmers received market information from multiple sources, individual traders and fellow farmers were frequently accessed and used. However, the farmers considered the

information obtained from traders and fellow farmers to be unreliable.

Conclusion and Recommendation

According to the results, there was a positive and significant relationship between factors influencing the utilization of finger millet and sorghum and food security variables. The regression analysis conducted to assess the relationship between factors indicated significance value ($p = 0.000 < 0.05$). From the findings, the following recommendations are proposed:

1. Political, religious and other civic leaders to embark nationwide awareness campaign on the benefits of sorghum and millet. This awareness should include all learning institutions as part of the syllabus.
2. Government should subsidize production inputs of sorghum and millet
3. Government should organize for collective marketing for sorghum and millet.The study revealed a positive but significant weak correlation between factors influencing the utilization of finger millet and sorghum and food security.

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