Association between household food access and livelihood food strategy factors in Githunguri and Mwala sub-counties, Kenya

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Abstract

Household food access is a critical concern for every government, community and household as it touches on the basic sources for human energy to do work and also for survival. Access to food is an essential component of good nutrition, health and well-being. Knowledge of food access risk sources and coping strategies can contribute to forward planning to avert food security hazards. This study analyzed the extent to which household food access was determined by livelihood food strategy factors employed during hazards. A sample size of three hundred and eighty four (384) was used. The study was carried out in two different livelihood zones i.e. high potential livelihood zone (Githunguri Sub-County) versus a medium potential livelihood zone (Mwala Sub-County). Household data were collected within two seasons using a structured household questionnaire. In addition, focus group discussions with a group of men, women and the youth were also conducted in each of the sampled sub-location. Data were analyzed using SPSS statistical data package for social sciences version 17. Pearson correlation index on factors that influence food access indicated a strong and significant relationship in total HH income (.718), total food available (.631) and HH storing ability (.545). There was a weak relationship in distance from household to the local market (.029) and household food strategy (.009). The study concluded that households in Githunguri Sub-County were mildly food insecure while households in Mwala Sub-County were moderately food insecure, implying that households in Githunguri Sub-County had better food access than households in Mwala Sub-County. The study recommends two studies that include: (i) Determination of opportunities and constraints to optimal income generation for improved food access (ii) Opportunities and constraints to increased food production hence food access

Key words; Food security, Food access, Hazards, livelihood strategies, Food strategy factors

1. Introduction

Disaster loses keep rising throughout the world due to a number of factors that include extreme weather events that are associated with increased climate variability and changes introduced by human activities in agricultural and food production systems. Human activities have increased risks among world communities, as there has been over reliance natural resources to serve an ever increasing population. Demographical change and human migrations have led to unplanned urbanization and growing demand for industrial goods and services. These changes have increased demand for food, thus making food security the most obstinate challenge for nations today (FAO, 2008).

Seeking to reduce disaster losses world nations met in Kobe Japan in 2005 and adopted a framework for action 2005-2015: Building the Resilience of Nations and Communities to disasters. Among the key issues adopted were the need for risk identification, assessments and monitoring underlying risk factors; Knowledge management and education and Preparedness for effective response and recovery (UN/ISDR, 2005). Analyzing the role of food in the world, FAO express food security to exist when all people have food at all times, have physical and economic access to sufficient, nutritious and safe food for an active healthy life and are not at all under undue risk of losing such access (FAO, 2006). Improving household food security throughout the world today is important as many households suffer from persistent hunger and under nutrition. It is important to others who are at risk of the same in future due to disaster losses. Keeping pace with growing food needs remains a global challenge mainly in view of hazards related to food access and poverty. In particular about half of Kenya's estimated population of 40 million people is poor with seven and a half million people living in extreme poverty. Over ten million people here suffer from chronic food insecurity and poor nutrition. It is also estimated

that at any time there are two million people requiring food aid/assistance, while during periods of drought, heavy rains or floods the number of the needy often doubles (GOK, 2008).

2. Literature Review
2.1 Food security in Kenya
Food security (access) in Kenya at times refers to individual entitlement of food that comes about through owning the food, either through production or having the purchasing power to buy it in the market. Food access is an element of food security where one has a recognized claim to food, such as being a family member entitled to share household resources or being included in a relief agency's list of those qualifying for food aid (Sen., 1982). Sen further notes that the most fundamental factor in understanding food access is to know the structures of ownership, production, distribution and income levels. In short this simply refers to food access. The knowledge that people are hungry because they do not own enough food is an integral part of any local household.

A poverty baseline study done in Kenya in 2010 reported that 53% of the population was living below the poverty line, while 51% were food poor (KNBS,2010). This meant poor endowment, thus poor food access. Food ownership (access) which often leads to food security in any given household is dependent on such factors as land tenure, agriculture production levels, storing ability, income levels, population increase, marketing and trade and gender roles. These factors are also subject to natural and human influence factors such as climate variability, soil fertility, natural calamities, pest and disease epidemics, environmental stresses, illness or death in a family, loss of income or property, structural vulnerability, inefficient government systems and international interventions (GOK, 2008). Food insecure households are not always hungry because their villages or counties produce less. Regularly, issues of international macro-economic that include marketing dynamics, distribution of foods and price play a critical role in determining household food access levels. In some cases households may access food at times when others cannot. In similar cases some households may lack access to food due to market forces, making it difficult for households to provide for diet diversity.

Luck of food diversity in Kenya contributes to food insecurity as majority of Kenyans rely on cereals and mainly maize as their staple food and rarely modify their meals to include other traditional and contemporary foods. However, low levels of maize production often leave many households with low access to required foods, thus remaining under-fed during times of poor harvest (GOK, 2001). Nevertheless prolonged droughts and low agricultural productivity have often exacerbated the country's food security situation with increased reliance on food relief in most arid and semi-arid counties including Kitui and parts of Machakos. Lack of adequate local and national strategic food reserves, high post-harvest loses and lack of effective control of crops and livestock diseases have often compounded the food problem. Although the private sector supports food provision balance by importing enough to cover domestic production shortfall, its effort has negative effects in that it often leaves the local food systems exposed to imports. In the long run, this destroys the local will to create local food sustainability through production.

2.2 Food security situation in Githunguri Sub-County
Githunguri Sub-County is a high potential zone (USAID, 2010). It is located to the east of the southern end of the Aberdare range. The zone is characteristic of Central Province and parts of Eastern, Western and Nyanza highlands. It is characterized by high population density currently at 852 persons per square kilometer in Githunguri (KNBS, 2009). Here, farmers have small land holdings of 1-5 acres of land. Rainfall ranges between 1350mm-1700mm per annum and is highly reliable. Land subdivision is common and shrinking land holdings have caused movement of households to less productive and marginal areas. Farming activities involve food crops, cash crops and livestock. The region has organized cooperatives that run cash crops and milk production (GOK, 2010). Off-farm employment is critical to income levels. Most of the food produced is spent within the household although many households depend on food purchases where about 50 per cent of the food is bought. Markets in the district are developed and integrated. Infrastructure is fairly developed, thus movement of goods is fairly good. This makes food price fluctuation relatively low during seasons of good production. While the area has high agricultural potential, climate variability, land subdivision, population growth and negative influence of drugs like alcohol in men have contributed to slowing down of development and social change. The very poor are therefore highly vulnerable to food shocks (USAID, 2008).

2.3 Food security situation in Mwala Sub-County
Mwala Sub-County is within a marginal agricultural livelihood zone that covers the southeastern and coastal lowlands (USAID 2010). It has a population density of 160 persons per square Kilometer. The production seasons are characterized by poorly distributed rainfall ranging between 800-1100mm per year (GOK, 2009). The zone is often drought prone and the March to May long rains are often unreliable. The short rains are the

most productive and account for close to 70 per cent of the food output. Different agronomic factors contribute to the poor produce experienced in the region. Maize accounts for close to 70 per cent overtaking even more drought resistant crops like sorghum, millets and green grams. Income structure of the households in this farming system indicate that about 40 per cent earnings are derived from crop sales, 30 per cent from livestock, 30 per cent from off-farm activities including money sent from earnings by household members working away (GOK, 2009). Most household members are migrant labourers employed in either far away urban centers or agricultural farms in neighboring high potential zones. In Mwala markets report wide differentials between the harvest and non-harvest periods. Households have average storage facilities and household heads often sell available food very early after harvest to meet other food and non-food financial obligations. Livestock production is limited by low productive capacity of the indigenous breeds that are able to tolerate drought conditions (KFSSG, 2008).

To mitigate food hazards among world communities there is an urgent need for thorough food access assessment. This study examined factors related to food access including choice of household food access strategy, distance from the local market, total household income, household food storing ability and total household food available in two unrelated livelihood zones.

3. Methodology
Objectives: To establish the extent to which household food access is determined by livelihood food strategy factors employed.

3.1 Hypothesis of the study
H_01 There is no significant relationship between household food access and livelihood strategy factors employed in the two counties.

3.2 Study area:
This was a cross-sectional survey done in two different sub-counties of Githunguri a high potential livelihood zone and Mwala a medium potential livelihood zone, in Kenya. The study involved collecting data that was used to evaluate the state of food access in the two sub-counties. Among many characteristics the two study regions have contrasting production patterns, rainfall, temperature and cultural differences.

3.3 Sampling method
Multistage sampling strategy was used to get the sample. Purposive sampling was used to select two locations from each of the two sub-counties. The sample size of three hundred and eighty four (384) was used. Ninety six (96) households in each location were proportionately shared among four simple random sampled villages in each location (two villages for each sub-location). Simple random sampling was used to select households in the two villages in each sub-location. The list of all village households was used as the sampling frame. All households in the village were listed and systematic random sampling used to select the households to be interviewed.

3.4 Data analysis:
Descriptive analysis involved calculating means for different groups, drawing histograms, bar graphs and summarizing data into ratios and percentages showing differences and associations in every considered variables. Chi-square test and correlation analysis were also used in the study.

4. Results and discussions
Household data indicated that male headed households in the sample were more than female headed households. Male headed households had better food access in four food categories examined. FGDs in Githunguri observed that current trends show increase in female headed households and male contribution to households seemed to decline. Examining the economic positions of the household head, self-employed household heads in Githunguri had better food access than those in Mwala. Pearson correlation analysis on the relationship between household head economic position and food access indicated a significant but weak positive correction index (r = 0.238). These findings were supported by Dolly (2009) who agreed that household head economic position was crucial to food access in the household.

The study found households headed by educated persons had better food access levels. Correlation analysis done to establish the relationship between education and food access indicated a significantly weak positive correlation index of (r =.138). This meant that education was a predictor of household food access. These findings were supported by a GOK study in Tharaka-Nithi County which found a positive correlation of (r = 0.5) between literacy and food access (GOK, 2008). Data on the size of land held by households indicated that

majority of households in the two sub-counties had small pieces of land that were below five acres. Correlation analysis on current household land size and food access indicated a positive though weak correlation index of (r =.055) showing a weak relationship of the two variables. These findings were supported by FAO (2005) report on the state of food insecurity in the world and Nigatu (2011) study on small-holder farmers coping strategies to household food insecurity and hunger in Ethiopia.

4.1 Choice of livelihood strategies
Understanding the choice of household food strategy was key to understanding the household livelihood driving factors that were crucial to determining the response mechanisms related to food access, food decisions and hazards. Household heads were asked to indicate the main livelihood food strategy employed in their household from a group of five strategies employed in the two sub-counties. The study found that majority of households in Githunguri applied cultivation and purchase strategy at 35.9% (69), while those in Mwala applied cultivation, purchase and assistance strategy at 33.5% (64). These findings were supported by Omosa (1998) in a study in Kisii district that concluded that choice of household food strategy was critical as it determined resource planning, utilization and household operations relating to land, money and time. Pearson correlation analysis on the relationship between choice of household food strategy and food access indicated a weak positive correlation index (r =.009). This meant that choice of food strategy was a positive predictor to household food access.

4.2 Distance from the local market
Local markets are often the focal points of most rural community activities. It is here that most non-farm household food needs are sourced. Trading that involves selling of farm produce as well as buying of farm inputs takes place in these local market centers, furthermore a market system often commands the distribution system from production to consumption and influences the overall business environment in any locality (FAO, 2011). Data from households indicated that majority of the households, 88 % (169), in Githunguri were located within one kilometer to the market compared to 82.2% (157) of the households in Mwala that were within 3kms away from the market. FGDs agreed that distance to the market was a critical element to food access. They argued that proximity of the household to the market contributed to effective commodity marketing and acquisition of farm inputs that in the long run influenced total household income. Distance to the markets did not only influence the purchasing power of food but also the quantity of food accessed. Correlation analysis on the relationship between distance to the local market and food access indicated a weak positive correlation index (r=.004) between the variables. This meant that distances to the market have a low but positive contribution to household food access. The findings were supported by Michele (2012) and U.S.A agriculture department (USDA, 2009).

4.3 Total household income
The total household income was the money at the disposal of the household head which could be used for food purchases. Such income for most households was earned either by selling farm produce or animals. Other household sources of income were employment and businesses done by household members. Household income also included any gifts or remittances from relatives or friends. Data on total income indicated that 81.1% (158) of the households in Githunguri had income above Kshs 10,000 (US $117) compared to 28.9% (55) of households in Mwala with the same income. The study found that households in Githunguri had better income than households in Mwala. FGDs indicated that households with better income did not only afford better food access, but could also afford other improved household requirements like taking children to better schools. They further noted that households with aged members in most cases got their income from remittances from relatives and support from friends.

Correlation analysis indicated a strong positive and significant correlation index of (r=.634). This meant that household income was a strong predictor of household food access. Thus, more income in the household contributed to better food access. Households with low income were predisposed to having low food access. The findings were supported by Marani (2012) in a study on household food and affordability in the USA. The study found that in rural households, the ability to pay for healthy foods was a cornerstone to maintaining household food security/food access. The findings were also supported by a study in Myanmar on rural household food security status and coping strategies (Dolly, 2009). The study findings agreed that household food access depended on food prices and household income and went on to affirm that households with low income had low food access unless where they were able to cultivate their own food or receive food support.

4.4 Household food storing ability
Food access addresses the supply of food for the household at all times. Household food storing ability as a major factor in food access deals with two elements i.e. whether the households have a place to store food for future use and the maximum length of time such stored farm harvest would last as stock. Households were asked

to indicate whether they had a food store in use. Commonly, rural households with a food store are often assumed to preserve farm surpluses as well as food bought for future use. Hence the presence of a food store in a household illustrated the level of household food preparedness and level of forward planning in terms of food storage and access.
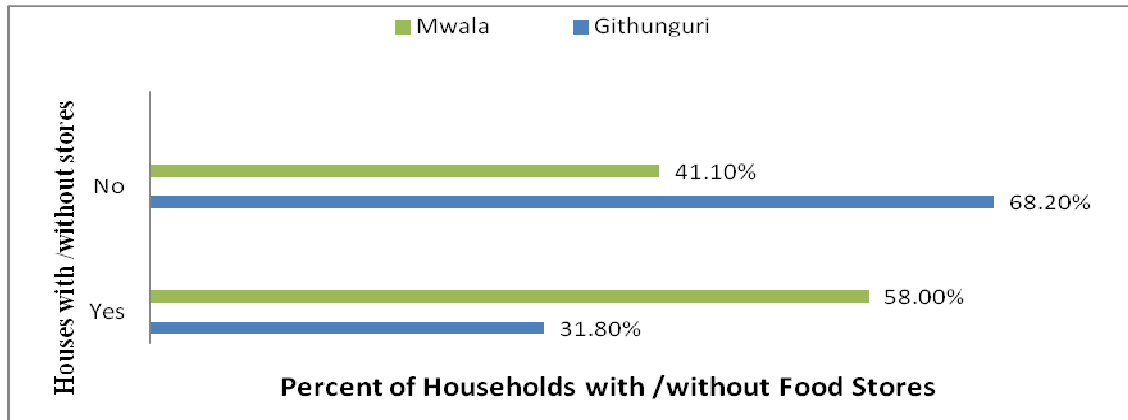

Figure1 Distribution of households with/without food stores
Source: Researcher (Field data)

Data on food stores in Figure1 indicated that 31.8% (61) of the HHs in Githunguri had food stores against 58.9% (113) in Mwala. In Githunguri, 68.2% (131) of the households did not have a food store against 41.1% (79) in Mwala. Majority of households with food stores were found in Mwala. This meant that households in Mwala had high concern in storing food for future use than those in Githunguri. FGDs concurred that most households that had a food store were often food secure and often well prepared in case of hazards.

FGDs further confirmed that most rural households were dependent on their farms for most food supply, hence the need to have a store. However, most of the harvested farm products often lasted for less than six months. The study found that over 90% (172) of households in Githunguri had food stocks lasting for less than six months compared to 84.9% (163) in Mwala. The study also found that more households in Mwala kept their food stocks longer than those in Githunguri. FGDs in the two sub-counties expressed their fears as to the short duration their food stocks lasted. However, in Githunguri FGDs observed that most households in their region could afford to buy food even in shortage times as most of them had earnings from cash crops and milk.
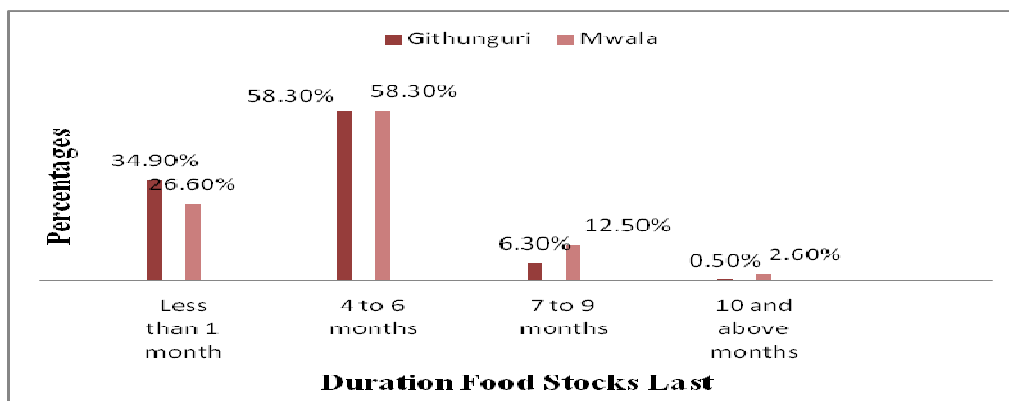

Figure 2 Duration food stocks lasted after harvesting
Source: Researcher (Field data)

Further analysis on household food stores and food access involved correlation analysis, with the results indicating that there was a significant strong positive correlation index of (r= 0.525). This meant that there was a strong relationship between household food access and household storing ability, therefore household storing ability was a good predictor of household food access. Thus, households with food stores had a higher capacity to afford food during hazard although not necessarily throughout the season for most households. The results were supported by KFSTWG (2010) study on food security in Kenya, KFSSG (2006) on Kenya drought report and KFSSGG (2008) study on the impact of rising prices on poor livelihood groups in Kenya. In summary the

studies noted that most households in Kenya were unable to store food beyond a season. This predisposes majority of households to food insecurity whenever hazards occurred. The findings were further supported by Dolly (2009) studies in Myanmar who noted that households that were able to store rice had better food access in times of shortage than those who could not.

4.5 Total household food available

Using the structured questionnaire households were asked to show the percentage amount of food they were able to provide from production, household purchases and household stocks and gifts (support). The sum of these four food sources were treated as the total food available in the households in this study. It was assumed that any household facing food shortage must have been unable to balance these sources to provide total adequate food for its members. This information was then tabulated into four major groups as shown below. This information was further used to compare the households:

Group (i) Food expenditure + own produce + stocks + gifts < than 50 % household food requirement.

Group (ii) Food expenditure + own produce + stocks + gifts < than 75% household food requirement

Group (iii) Food expenditure + own produce + stocks + gifts > 75% household requirement

Group (iv) Food expenditure + own produce + stocks + gifts is > 100%. The information was then put into a table as seen in Table 4.3.6

Table 1 Total food available in a household

			Below 50%	Above 50% but below 75%	Above 75% but below 100%	Above 100% available	Total
District	Githunguri N=192	Count	8	51	114	19	192
		% within District	4.2%	26.6%	59.4%	9.9%	100.0%
	Mwala N= 192	Count	14	153	24	1	192
		% within District	7.3%	79.7%	12.5%	.5%	100.0%
Total		Count	22	204	138	20	384
		% of Total	5.7%	53.1%	35.9%	5.2%	100.0%

Source: Researcher (Field data)

Sub-county group comparisons in Table1 on total food available indicated that that there were more households in Githunguri 9.9% (19) who had food beyond 100% of their requirements compared to Mwala with 0.5% (1). Further, majority of households in Githunguri 59.4% (114) had total food available above 75% of their requirements, while majority of households in Mwala 79.7% (153) had total food available between 50% and 75%. There were more households in Mwala 7.3% (14) with less than 50% total food available compared to 4.2% (8) households in Githunguri Sub-County.

FGDS reported low food access as most households often sold their harvest to middlemen to meet non-farm needs during harvest times. Comparing total food available to the size of the household in Figure 3 indicated that households with 3 and 4 and those with 5 and 6 members had better food access status in the two sub-counties as they had food above 50%. Pearson correlation analysis results indicated a strong positive and significant correlation index of (r=0.631). This meant that total food available was a good predictor of household food access. Thus household food access during hazard times was highly dependent on HH total food available
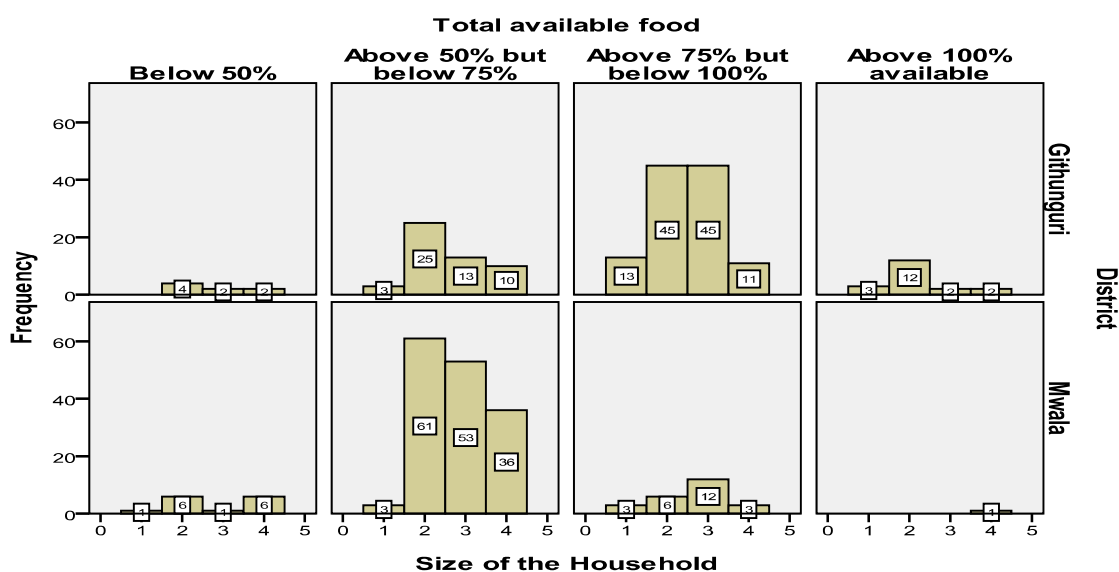
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Figure 3 Total foods available in households compared to HH size
Source: Researcher (Field data)

These findings were consistent to a study carried out in Umbumbulu in Kwa-Zulu Natal province of South Africa on household food sources and coping strategies (Mjonono, Ngidi, & Hendriks, 2009). The findings that most households were selling their food during harvest to afford income for none farm requirements were critical to food access levels. There is need to address household income by expanding livelihood activities

4.6 Correlation analysis on livelihood strategy factors
Computed Correlation analysis to find the linear relationship between the independent variables (choice of household food strategy, distances from the local markets, total household income, household food storing ability and total food available in the household) and the dependent variable food access indicated a weak relationship in household food strategy (r = 0.009) and distance to the local market (r = 0.029) and a significant strong relationship in household storing ability (r=0.545), total food available (r = 0.631) and total household income (r = 0.718).

Table 2 Correlation analysis on livelihood strategy factors

		food access	Household food strategy	Distances to the local market	Total income	HH Storing ability	Total available food
food access	Pearson Correlation	1	.009	.029	.718**	.545**	.631**
	Sig. (2-tailed)		.860	.569	.000	.000	.000
	N	384	384	384	384	384	384

Source: Researcher (Field data)

4.7 Hypotheses testing
The findings on hypotheses testing were established by carrying out a two tailed Chi- square test. The study tested the following hypothesis on all the livelihood strategy factors using Chi-Square at (.05) significant levels. H_01 There is no significance relationship between household food access and livelihood food access strategy factors in the two sub-counties. The result indicated significant values with a   p value = 0.000 in all factors. The study rejected the null hypothesis and concluded that there was a significant relationship between household food access and food strategy factors in the two sub-counties.

5. Conclusion
The study found that food access in the study area was dependent on livelihood food strategy factors that included: choice of household food strategy, distances from the local markets, total household income, household food storing ability and total food available in the household. The study further found that cultivation and food purchase were the two major features of household food access in the two sub-counties. Most

households in Githunguri were within 1km from the local market compared to households in Mwala which were 3km from their markets. The study found that most households in Githunguri had higher incomes than households in Mwala Sub-County. There were more households with food stores in Mwala (58%) than in Githunguri (31.8%), while majority of household's stored food lasted between four to six months in the two sub-counties. Most households in Githunguri afforded above 75% of their household requirements while those in Mwala afforded above 50% and below 75% of their food requirements. The study concluded that households in Githunguri sub-county are more food secure than households in Mwala sub-county.

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