



FOOD SECURITY SCORE FOR KENYA

By

Samwel Wakibi, Wanjiru Gichuhi & Wanjiku Mukabi Kabira

Abstract

Article 43, Section (1)(c) of the Bill of Rights of the Kenya Constitution (2010) states that:

“Every person has the right to be free from hunger, and to have adequate food of acceptable quality. To monitor progress and targeting interventions towards realization of this goal, an easy-to-use, but scientifically sound measure of food security is required.”

The objective of this paper is to construct such measure that will subsequently constitute a Food Security Score (henceforth, FSS) for Kenya. This Food Security Score will enable the classification of the food security status of each county in the country.

This FSS study was nested within a cross-sectional baseline study conducted by the African Women’s Studies Centre (AWSC). The study had a representative sample of 4,129 households drawn from 20 randomly selected counties within six of Kenya’s Agro-ecological zones. The food security score study consulted one adult respondent in each household on the experiences, practices and behaviours of household members that have a bearing on food insecurity, including concerns such as: (a) not having enough food to feed the entire household; (b) cutting back on meal rations because of insufficient amounts of food

stuffs; (c) lack of resources to buy food, and (d) going to bed hungry because of an absence of food to feed the household. Out of the 4129 households surveyed, 4060 responded to all four key questions selected to compute the FSS for Kenya. The results of the study revealed that whereas 67 percent of Kenyan households are food secure, 30 percent are food insecure, meaning that they lack access to enough food to sustain an active, healthy life for all members of their households. From the category of the food insecure group, a total of 9 percent are chronically food insecure. Based on this FSS, food security varied significantly amongst various counties and agro ecological zones. Agro-ecological zone (p -value <0.001) and county (p -value <0.001) are significantly associated with food security. Counties with higher rates of food insecurity than the nationally defined levels are mainly found in the coastal lowlands, inland lowlands and upper midlands agro-ecological zones. In line with the Constitution of Kenya (2010), efforts towards achieving food security need to focus on ensuring that all Kenyans are food secure. Although the two variables relating to the specific agro-ecological zones and counties significantly impact on food security in Kenya, these are not amenable to interventions. Hence, they can be used to target the most vulnerable regions and monitor improvements

after implementing appropriate interventions to ameliorate food security. However, further research is recommended to validate the FSS

Key words: Food Security, Food Security Score, Agro-Ecological Zones

regionally and internationally in order to improve its universality of interpretation.

1.1 Introduction

In its effort to contribute towards the achievement of zero tolerance to hunger in Kenya, the African Women's Studies Centre (AWSC) undertook a project titled: *Towards Food and Nutrition Security - Implementation of Article 43 (1)(c)*, with the aim of advocating for and promoting the implementation of Article 43 (1)(c) of the Bill of Rights, which states that: "Every person has the right to be free from hunger, and to have adequate food of acceptable quality."¹ One of the specific objectives of this study was to develop a summarizing measure (composite score) to investigate food security in Kenya. This paper aims at meeting this objective by constructing a Food Security Score (henceforth, FSS) for Kenya and use it to classify the food security status of each county and agro-ecological zone in the country.

The Food and Agricultural Organization (FAO) defines food security as a situation when: "...all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life."² The four pillars of food security are stipulated as: *availability, access, utilization and stability*.³ In contrast, food insecurity exists when food is not easily accessible and households have difficulty securing adequate

food (FAO, 2004). Food insecurity leads to poor health, low productivity, poor physical and cognitive development and high mortality⁴. Moreover, food security and poverty are directly interlinked and highly correlated, especially in an agrarian economy such as Kenya's.⁵ Food insecurity studies identify some common domains that describe the experience of food insecurity which includes: (a) anxiety/uncertainty about whether the food budget or supply would be sufficient to meet the basic needs of the household; (b) perceptions of inadequate quality or quantity of food; (c) reduction of adult food intake; (d) reduction of child food intake; and (e) coping actions taken by the household to augment the food budget or food supply.⁶

The (2013) Food and Agriculture Organization (FAO) *Report on the State of Food Insecurity in the World* observes that 842 million people in 2011–13; one in eight people in the world were estimated to be suffering from chronic hunger, regularly not getting enough food to conduct an active life. The most affected are sub-Saharan countries, where one in four people suffer from chronic hunger.⁷ In Kenya, over 10 million people are food-insecure, with

¹ Constitution of Kenya (2010)

² FAO (2002)

³ ADB (2012)

⁴ Dreze and Sen (1989,

⁵ Rukhsana (2011)

⁶ Coates et al (2006)

⁷ FAO, IFAD and WFP (2013)

the majority of them forced to rely on food relief⁸.

According to the (2012) Global Hunger Index Report, amongst the world's regions, South Asia and Sub-Saharan Africa continue to have the highest reported levels of hunger.⁹ These results represent extreme suffering for millions of poor people. Hence, there has been a growing need to monitor global hunger levels; assess these needs and target food insecure households with appropriate interventions; as well as provide a summary measure for food security.¹⁰ Although a number of methods have been proposed, most of them are fraught with methodological challenges including complex data collection requirements.¹¹

Kenya has no food security index that recognizes the complex elements influencing the food security landscape so as to be able to assess areas of strength and weakness that can inform policy making. This study reviewed the available literature on food security measurements, selected reliable indicators, and then proceeded to construct a Food Security Score (FSS) for Kenya.

The Economic Intelligence Unit of the Economist group developed a Global Food Security Index using a simple descriptive method. The Index is the weighted average of the scores assigned to each of the four food security elements, namely: (a) affordability; (b) availability; (c) quality; and (d) safety. In turn,

the overall score for each element is the weighted average of the scores allocated to each indicator used as a proxy for the said element. The indicators vary – ranging from those that measure a population's ability to purchase food products; those that measure the volume and consistency of food supply in the country; to a combination of consumption pattern determinants, and micronutrient availability in the local food supply.¹²

The Community Childhood Hunger Identification Project (CCHIP) index, the household dietary diversity score and the food variety score are among the measures developed for this purpose in the United States of America (USA).¹³ This index defines hunger as the mental and physical condition arising from not eating enough food because of insufficient economic resources within the family or community. In contrast, the household dietary diversity score and the food variety score measure the average number of food groups or items consumed within a household over a period of 24 hours: from a total of 12 possible food groups and of 45 possible items, respectively. The World Food Program (WFP) has also constructed a Food Consumption Score (FCS), which includes information about diet quality, which examines whether individuals are able to meet all their daily nutrient requirements.

The USA food security measurement methods assess food insecurity as experienced by households based on their-self-reports of behaviours, experiences, and conditions that are known to characterize households having

⁸ Kenya Food Security Portal (2010)

⁹ Food and Agriculture Organization (FAO) Report (2013) by the International Food Policy Research Institute (IFPRI), (2013) *Concern Worldwide, and Welthungerhilfe*.

¹⁰ Bickel, et al (2000); Carlson et al (1999); United States Department of Agriculture (1995); and Girvan (2001).

¹¹ Wiesmann et al (2009).

¹² This method has also been used in India by Shakeel et al (2012) and Rukhsana (2011).

¹³ Swindale et al (2006); Steyn et al (2006); and Kaaks (1994).

difficulty meeting their food needs. The Household Food Security Scale is a measure of the severity of household food stress or food access problems. This method has been used in the USA and the Dominican Republic, and has been validated using data from Haiti, Burundi and Sri Lanka. Food and Nutrition Technical Assistance (FANTA) Projects have also used and adapted the food insecurity (access) scale approach in a number of countries for a range of different purposes.¹⁴

Most of the studies on methods of measuring food security reviewed were unsuitable for this study due to methodological and data limitations. For instance, the Global Food Security Index uses aggregate data while the Kenya study is based on a household level analysis. This study, therefore, adapted the USA food security measurement methods to derive the FSS for Kenya due to methodological and data limitations. However, because of a lack of data, the selected FSS for Kenya prioritised 4 food security indicators on food availability and access. Unfortunately, there is insufficient data on sustainability and nutrition.

1.2 Materials and Methods

This study on the FSS for Kenya was nested within a cross-sectional baseline study titled: “*Towards Food and Nutrition Security*” carried out by the African Women’s Studies Centre (AWSC) in collaboration with the Kenya National Bureau of Statistics (KNBS). The objective of the baseline study was to assess the state of food security in Kenyan households. A representative sample of 4,129 households was drawn from twenty (20)

randomly selected counties within six (6) of Kenya’s Agro-Ecological Zones.¹⁵

The baseline study collected household background information, livelihood strategies, perceived hunger, main sources of food and key government donor support programmes including food storage methods, access to land, livestock assets and ownership and coping strategies. The study was based on the FAO (1996) conceptual framework on food security which introduces the four dimensions of food security/ availability; access; utilization; and stability. The methods of data collection covered both quantitative and qualitative approaches.

The FSS study employed survey-based methods adapted from The USA Food Security Measurement Project and the FANTA Project. The USA food security measurement methods have been adapted for use in a number of other countries.¹⁶ The USA tool has eighteen (18) questions (full module) about self-reported food conditions of the household as a whole and a section focusing on children. However, in this study, the number of questions administered was reduced to eight (8) and were about self-reported food conditions of the household as a whole. Although households surveyed had children (0-17 years), the survey did not include questions about their food conditions.

The FSS study sought information from one adult respondent derived from each household consisting of a series of questions about experiences, practices, and behaviours of household members that indicate food insecurity. This included concerns about

¹⁴FANTA (2009).

¹⁵AWSC and KNBS (2014)

¹⁶Coates et al (2006b) & Health Canada (2007)

insufficient amounts of food; reducing the meal rations because of insufficient amounts of food stuffs; or sleeping hungry because of the absence of food. The FSS of the household was assigned based on the number of food-insecure conditions reported. Each of the eight questions interrogated whether the condition or behaviour occurred at any time in the last 10 months prior to the survey. The responses to the questions were scored on the following Likert scale:

1=Never; 2=Sometimes; 3=Often; 4=Always.

The Instrument used was based on eight (8) questions about the food conditions of a household (see Appendix I) grouped in the following domains:

- Anxiety and uncertainty about household food access
- Insufficient quality (includes variety, preferences, and aspects of social acceptability)
- Insufficient food intake and its physical consequences

1.3 Food Security Score

The food security data for Kenya was summarized in the form of a FSS, which consists of the total score of the food insecure conditions and behaviours based on household reports. Food-insecure conditions are indicated by responses such as “often”, “always” or “never” to the following questions:

- Did you worry that your household would not have enough food?
- Did you or any other household member eat fewer meals in a day because there was not enough Food?
- Was there a time when there was no food at all in your household because there were not enough resources to go around?

- Did you or any household member go to sleep at night hungry because there was not enough food?

These four questions are reflective of food sustainability, availability, access as well as utilization as demonstrated by the FAO (1996) conceptual framework. Questions 2 to 4 refer to food preference and social acceptability and are often context specific, and therefore, difficult to standardize, since they refer not only to a “need” but also a “want”, which one can do without. Questions 5 to 6 are highly correlated and thus, to avoid double counting, Question 5 was not included in the analysis.

The continuous variable for the FSS based on household reports (in response to the four questions) ranges from 4 to 16 points as follows: the responses at the extreme are “never” and “always” which corresponds to 1 and 4 points respectively. It therefore follows if a household responded “never” to the 4 questions it had a total score of 4 points on the Likert scale, and if it responded “always” to the 4 questions it had a total of 16 points. This indicator is a sensitive indicator of incremental changes in household food insecurity.¹⁷ However, beneficiaries, program implementers, and policymakers usually want to know what proportion of households is food insecure (access) and how that proportion has changed as a result of program activities. A continuous FSS does not provide this information.

A categorical indicator that classifies households into different categories based on the severity of food insecurity (access) is, therefore, needed. The following three categories were used:

¹⁷Swindale and Bilinsky (2006)

Total Points	Category
4-8	<i>food secure</i>
9-12	<i>low food security</i>
13-16	<i>chronically food insecure</i>

- i. “*Food secure*” refers to a combination of “*never*” and “*sometimes*” responses to the 4 questions. On a Likert scale, “*never*” is equal to 1 point and “*sometimes*” to 2 points. “*Food secure*”, therefore, ranges from 4 to 8 points as follows: if a household responded “*never*” to the 4 questions it had a total score of 4 points on the Likert scale, but if it responded “*sometimes*” to the 4 questions it had a total of 8 points.
- ii. “*Low food security*” consists of a combination of “*sometimes*” and “*often*” responses to the 4 questions. On a Likert scale “*often*” is equal to 3 points. It follows, therefore, that a household responding “*often*” to the 4 questions had a total score of 12 (3 points per question “*times*” 4 questions). “*Low food security*” ranges from 8 to 12 points
- iii. “*Chronically food insecure*” consists of responses that range from “*often*” to “*always*”. Where a household responded “*always*” to the 4 questions, the total score was 16 points. “*Chronically food insecure*”, therefore, ranges from 12 to 16 points.

The score has the following policy uses:

- i. *Measurement tool*. It provides a measure of the suffering in the country and can be employed to assess the relevance of hunger in relation to other world issues like climate change and poverty.
- ii. *Accountability tool*. Kenya is committed to combating hunger and

this can be monitored by tracking hunger indices over time.

- iii. *Targeting tool*. A food security score can guide the allocation of funds between counties and within counties.

Accordingly, households were classified as “*food secure*”, if the total score of the 4 questions ranged from 4-8; “*low food security*” (if it ranged from 9-12 points) and “*chronically food insecure*” (if the total score ranged from 13-16 points).

Although this questionnaire for FSS is meant to be universal, the results are country and context-specific. This is because this scale is not empirically tested, meaning that the tool has universality of content but lacks universality of interpretation.

1.4 Results and Discussion

1.4.1 Distribution of Household Responses to the Food Security Questions

Out of 4129 households surveyed, over 98 percent responded to all the questions, which were then analysed. Twenty seven percent of the households did not worry that they would not have enough food, 44 percent did sometimes worry, 17 percent often worried, while 13 percent always worry that they would not have enough food. This information is reflected on *Table 1*.

Table1: Percentage distribution of household responses to questions on food security

Question	Never	Sometimes	Often	Always
Did you worry that your household would not have enough food?	26.6	43.6	17.1	12.6
Was any household member not able to eat the kinds of foods you preferred because of lack of resources?	21.4	45.4	21.1	12.1
Did any household member eat a limited variety of foods due to lack of choices in the market?	38.3	38.1	15.0	8.6
Did any household member eat food that you preferred not to eat because of a lack of resources to obtain other types of food?	22.4	46.0	20.7	10.9
Did any household member eat smaller meals in a day because of lack of resources to obtain enough?	25.6	44.6	19.6	10.2
Did any household member eat fewer meals in a day because there was not enough Food?	28.4	43.5	17.8	10.2
Was there a time when there was no food at all in your household because there were not enough resources to go around?	42.1	36.9	14.6	6.5
Did any household member go to sleep at night hungry because there was not enough food?	52.1	32.1	10.6	5.2

Twenty one percent of households surveyed are able to eat the kinds of foods they prefer, while twelve percent are always not able to eat the kinds of foods they prefer for lack of resources. Thirty eight percent of the households were able to access foods of their choices in the market, while nine percent eat limited varieties of foods due to lack of choices in the market. Twenty two percent of households eat the food of their preference, while 11 percent always eat what they do not prefer for lack of resources to obtain other types of foods.

Twenty six percent of the interviewed households had enough food to eat everyday, 45 percent sometimes ate smaller meals in a day for lack of resources to obtain enough, while ten percent of the households ate smaller meals in a day due to insufficient financial resources. Twenty eight percent of the sampled households had never eaten fewer meals in a day for lack of enough food, while ten percent rationed their meals daily because food was not available. Forty four percent reported eating fewer meals in a day because they did not have enough food to eat.

Due to insufficient financial resources, seven percent of the households are always without food, while 42 percent had never experienced a situation without food due to lack of resources. Five percent always go to sleep at night hungry for lack of enough food, while 52 percent have never gone to sleep hungry for lack of enough food.

1.4.2 Food Security Score (FSS)

A total of 4060 households surveyed responded to the 4 questions selected to compute the FSS for Kenya. Based on this, Kenya is 67 percent food secure. Thirty three percent of these households are food insecure; 24 percent have low food security and nine percent were classified as chronically food insecure (see Table 2).

Table 2: Food Security Score for Kenya

Total points		Frequency	Percent
4-8	Food secure	2702	66.6
9-12	Low food security	991	24.4
13-18	Chronically food insecure	367	9.0
	Total	4060	100.0

Food Security by Agro- Ecological Zone

Kenya has seven agro-ecological zones, namely: (1) Urban Areas (UA); (2) Upper Highlands (UH); (3) Lower Highlands (LH), (4) Upper Midlands (UM); (5) Lower Midlands (LM); (6) Inland Lowlands (IL); and (7) Coast Lowlands (CL). Based on the new score, the Upper Highlands (UH) zone is the most household food secure, with over 85 percent of households being food secure, and only 2 percent chronically food insecure (see Table 3). The Lower Highlands (LH); Urban areas (U) and Lower Midlands (LM) zones are fairly food secure, with over 69 percent of the households being food secure. However, ten percent of households in the Lower Highlands (LH); nine percent in urban areas (U); and over six percent in the Lower Midlands zones are chronically food insecure.

Households in the other agro-ecological zones such as the Upper Midlands (UM); Inland Lowlands (IL) and the Coastal Lowlands (CL) suffer elevated food insecurity. Less than 47 percent of the households in Coastal Lowlands (CL), 51 percent in Inland Lowlands (IL) and 59 percent in Upper Midlands (UM) are food secure. Forty three percent of households in the Coastal Lowlands often experience food insecure conditions, with 19 percent of the households located in the Inland Lowlands (IL), and over ten percent in the Upper Midlands (UM) zones being chronically food insecure (see Table 3).

Table 3: Food Security Score (FSS) by Agro-Ecological Zone

	Food secure	Low food security	Chronically food insecure	Number of households surveyed
Urban Areas (UA)	69.4%	21.5%	9.0%	432
Upper Highlands (UH)	85.5%	12.1%	2.4%	620
Upper Midlands (UM)	58.8%	30.7%	10.5%	600
Lower Highlands (LH)	70.0%	20.3%	9.8%	400
Lower Midlands (LM)	69.4%	24.2%	6.4%	1215
Inland Lowlands (IL)	51.1%	29.8%	19.1%	581
Coastal Lowlands (CL)	46.9%	43.1%	10.0%	209
Total	66.6%	24.4%	9.0%	4057

Based on the FSS, the agro-ecological zone is significantly associated with food security. Households in the Upper Highlands (UH) are twice as food secure as those in the Coastal Lowlands (CL), while household in the Inland Lowlands are ten times more likely to be chronically food insecure than those in the Upper Highlands (UH).

1.4.3 Food Score by County

Turkana, Kisii and Migori are the most food insecure counties in Kenya. About 39 percent of households in Turkana County experience chronic food insecurity; followed by 24 percent in Kisii and 20 percent in Migori. Only 23 percent of the households in Turkana County are food secure; 34 percent in Kisii and 42 percent in Migori (see Table 4).

Table 4: County Food Security Score

	<i>Food secure Percentage</i>	<i>Low food security Percentage</i>	<i>Chronic food insecure Percentage</i>	<i>Number of households surveyed</i>
Baringo	75.4	16.1	8.5	211
Bomet	83.7	14.8	1.5%	196
Bungoma	65.4	30.8	3.8	211
Elgeyo Marakwet	76.0	20.2	3.8	208
Isiolo	47.6	37.7	14.6	212
Kajiado	80.7	17.9	1.4	207
Kiambu	84.2	15.3	.5	215
Kirinyaga	94.8	4.7	.5	192
Kisii	33.8	41.9	24.2	198
Kwale	46.9	43.1	10.0	209
Laikipia	75.7	16.8	7.6	185
Makueni	66.5	26.1	7.3	218
Migori	41.7	37.5	20.8	168
Mombasa	65.1	28.4	6.4	218
Nairobi	73.8	14.5	11.7	214
Nakuru	86.4	10.9	2.7	221
Nandi	65.1	23.3	11.6	215
Taita Taveta	74.0	20.0	6.0	215
Trans-Nzoia	55.9	36.6	7.5	186
Turkana	23.4	37.3	39.2	158
Total	66.6	24.4	9.0	4060

Kirinyaga, Nakuru, Kiambu and Bomet are the most food secure counties in Kenya. Kirinyaga registered 95 percent; Nakuru 86 percent; while Kiambu and Bomet registered 84 percent food security. Only 3 percent of households in Nakuru are chronically food insecure; less than 2 percent in Bomet; and less than 1 percent in Kirinyaga and Kiambu counties.

Turkana is the most food insecure county in Kenya. Thirty nine percent of the 159 households surveyed are chronically food insecure, while 37 percent have low food insecurity. Kirinyaga is the most food secure county in Kenya with 95 percent of the 192 households interviewed reporting food security and only one percent being chronically food insecure. Seventy five percent of the 211 households surveyed in Baringo county are food secure, 16 percent have low food security while nine percent are chronically food insecure.

Based on this FSS survey, the County variable is significantly associated with food security in Kenya. Food security in Kirinyaga County is more than 4 times higher than that of Turkana, while a household in Kiambu is 70 times less likely to suffer chronic food insecurity than one in Turkana County.

1.5 Conclusion

According to this FSS investigation, slightly above two thirds (67 percent) of the surveyed households were found to be food secure. This is an obvious noncompliance with the definition of food security and the *Constitution of Kenya (2010)* on the Bill of Rights, Article 43 (1)(c) that clearly stipulates: “Every person has the right to be free from hunger, and to have adequate food of acceptable quality.” Slightly less than a quarter (24 percent) of Kenyan households has low food status-meaning that they are currently not meeting their food security needs. More critically, nine percent of

households are chronically food insecure. Marked differences in food security exist among the county and agro-ecological zones. It was established that the counties with higher rates of food insecurity than the national levels were mainly located in the Coastal Lowlands (CL), the Inland Lowlands (IL) and the Upper Midlands (UM) agro-ecological zones. The high rates of food insecurity among counties in the Upper Midlands (UM) agro-ecological zone may be the result of the high land fragmentation observed in Kisii and the lack of food storage culture in Trans Nzoia County as explained in a qualitative study which was part of the baseline study conducted by the AWSC.

In line with the Kenyan Constitution, all efforts should be put in place to make sure that all Kenyans enjoy food security and that the country should embrace the motto of *“Zero Tolerance to Hunger,”* as endorsed by the African Women’s Studies Centre (AWSC) and the Kenya Bureau of Statics (KBS). In Kenya, food security varies depending on the agro-ecological zone and the county. It was noticed

that in certain counties such as Kirinyaga, most households are food secure, whereas in Turkana County, 40 percent of the surveyed households suffer chronic food insecurity. Consequently, national food policies should target the most vulnerable counties and agro-ecological zones.

In the short term, an Emergency Food Programme scheme that supplements food rations and provides school feeding programmes needs to be urgently implemented in the counties currently experiencing high level of chronic food insecurity. However, in the long term, the Government of Kenya needs to implement projects to help alleviate poverty, implement routine data systems to monitor food security, provide incentives to farmers to increase food production and modernize food distribution systems. Further research is also recommended to validate the Food Security Score to improve the universality of its interpretation.

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Appendix I: Reduced model of “Household Food Security Score” Questionnaire

A. Anxiety and uncertainty about household food access:

1. Did you worry that your household would not have enough food?

B. Insufficient quality (includes variety, preferences, and aspects of social acceptability):

2. Were you or any household member not able to eat the kinds of foods you preferred because of lack of resources?
3. Did you or any household member eat a limited variety of foods due to lack of choices in the market?
4. Did you or any household member eat food that you preferred not to eat because of a lack of resources to obtain other types of food?

C. Insufficient food intake and its physical consequences:

5. Did you or any other household member eat smaller meals in a day because of lack of resources to obtain enough?
6. Did you or any other household member eat fewer meals in a day because there was not enough Food?
7. Was there a time when there was no food at all in your household because there were not enough resources to go around?
8. Did you or any household member go to sleep at night hungry because there was not enough food?