

# Relationship between Mothers' Socio Demographic Characteristics and Food Security Status in Kangai and Mutithi Locations of Mwea West Sub County, Kenya

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## Abstract

The purpose of the study was to determine the relationship between mothers' socio demographic characteristics and food security status in Kangai and Mutithi Locations of Mwea West Sub County, Kenya. The design was cross sectional survey while the data instrument was a structured researcher administered household questionnaire. Sampling techniques included probability proportionate to population, The Socio Demographic data were analyzed by the use of proportions and t-tests while food security status data were analyzed by the use of Health Canada's, Household Food Security Survey Model (Health Canada, 2012). Logistical regression model was used to determine the relationship between Socio Demographics and Food Security Status. It was found out that the socio demographics of the mothers in the two locations were significantly different. The house hold food security status for the Sub County was that 39% of households were food secure, 21% were moderately food insecure while 40% were severely food insecure. Gender of the household head, marital status, religion, age, occupation, education, income sources, expenditure on food and land size were the most pronounced proxy indicators for food security status in the Sub County and they underscore the poverty levels in the area. Further research is suggested on possible interventions for food insecurity in the sub county.

**Keywords:** Food Security Status, Socio Demographic Characteristics, Socio Economic Characteristics, Poverty

## 1. Introduction

Studies have found socio demographic and socio economic characteristics are useful in the issue of household food security status (Maxwell, 2013; Segal-Correa, 2008). Some important characteristics include: Gender of household head, marital status and age, education, income, housing quality and ownership of livestock, assets and land. In relation to household headship, which is usually the man's responsibility in case of married couples, Kennedy and Peters (1992), cited in Kiriti and Tisdell, (2003), reported that household food security status and micronutrient intake were influenced by interaction and gender of the household head. They reported that in situations where the official household head (man) was away for more than 50 percent of the time, the women took over the headship and controlled a low budget and other resources. In cases like this, the study reported that the nutritional status of the pre scholars was better than in higher income but male headed households. The report concluded that improving women's income and empowering them to control the income is vital in maintaining food security and micronutrient intake in households.

A married woman may be at an advantage over a single, divorced or widowed woman when it comes to household food security since two are better than one. On the other hand, the age of the respondent is also an important variable. This is because young household heads may not be having their own resources and may be depending on other adults for their livelihoods. In addition, younger household heads, living in rural areas have been found to be more food insecure than the older ones (Kakol et al., 2005). Households with larger dependency ratio tend to be more food insecure (WFP, 2011; Kakol et al., 2005; Matheson and McIntyre, 2013). It has been reported that households with large families and many dependents, may not be able to provide sufficient quantity and the right quality of food intake for each member of the family. Studies have found that at certain times of the year family members may take one meal a day (AWSC, 2014). However, it is also a known fact that large families living in the rural areas contribute in the farming activities and hence in household food production. The joint family effort in labor provision can help to increase food production as long as other resources such as land are available.

Women's access to education is a determinant factor in level of access to quality food which has an impact on nutrition and health status for the household members. Studies have revealed that children of mothers who have spent five years in primary school are 40 percent more likely to live beyond the age of five years (FAO, 2011). Also households headed by women who have Kenya Certificate of Education are more food secure than households headed by men at the same level (AWSC, 2014). Unemployment is an indicator of low household food security and micronutrient intake. It has been found that women's cash earning outside the household is an important source of income (Kiriti- Nganga 2003 as reported in AWSC, (2014). In her study of Nyeri district, Kiriti reported that income earned by women can be used for food expenditure. She further reported that women

are known to spend a greater percentage of their income on food than men. In her study, she found that employed women were contributing Ksh 1000- 9000 to the total household income and as is known, most of women's income is used for food purchases. Kiriti's study (2003) concluded that women play a major role in food security, dietary diversity and household's health. But unfortunately, women are more likely to be unemployed than men since they spend a lot of their time doing unpaid domestic work and caring for children and other household members.

The African Women Studies Center (2014); collaborative initiative of ICRW/ IFPRI/ USAID, (2005); supported by Smith et al (2008), report that women do not often own the land they work on. Therefore they lack the authority to decide where, what and when to plant; whether or how to irrigate the land; when to rest the land or to use inputs to improve soil fertility; how to prevent soil erosion to preserve crop nutrients; how much crop to sell and what to do with money obtained after sale of crops (Smith, et al 2008). In addition, women have very heavy workloads. They have to work on the farm to ensure food security, care for children and the sick members of the family. Their workload is made heavier by inadequate access to improved water supplies and excessive dependence of wood fuel as a source of domestic energy. All these factors contribute to food insecurity (Migiro, 2004; Sekitoleko, 2004).

Low income is associated with food insecurity. Poor communities often have little income to spend on food. They therefore rely on monotonous plant based diet, low in animal products, and women are especially vulnerable, as their incomes are on average lower than men's. Income is commonly used as a socio economic (SES) indicator. Housing quality, that is, the quality of material used in a housing structure, is a good proxy indicator of the respondent's wealth (KU- CFSVA, 2010). Measures of housing condition include roofing, flooring, walling materials as well as primary energy source for cooking, household water source and sanitation facilities (Doocy et al., 2003). Poor communities use natural materials like grass for roofing and walling their dwellings while the well-off communities use stones or brick for wall, tiles or corrugated iron sheets for roofing and concrete floors. The wealthy households, as may be indicated by housing quality, are expected to be more food secure than the poor households.

According to the Government of Kenya (2007), Kenya Integrated Household Survey (KIHS 2005/2006), 66 percent of Kenyan households kept livestock. Majority of the rural households (84%) kept livestock. Large livestock like cows are owned by men but small livestock like chicken, goats and sheep are the property of women. The small livestock especially chicken can be used for high quality proteins in form of eggs and meat and enhance access and consumption of food to the household. Goats and sheep also provide high quality protein foods in pastoralist communities. Presence of cows in a household may indicate availability of milk which is rich in proteins and micronutrient. However, while presence of cows in the family may indicate availability of milk as a food, not all households allow the women to control the milk (AWSC, 2014). In order to reduce food insecurity, Lo Bianco, (2007) recommends that women can be supported in the role of livestock ownership to strengthen their ability to make decisions that can break the poverty cycle.

According to Morris et al., (2000), and Schellenburg et al., (2003), asset ownership is an indicator of socio economic status (SES). Since assets can be sold, a household with many assets can be assumed to have the ability to access adequate food for family members. Asset ownership is a proxy of wealth. It is associated with a level of resilience or ability to withstand the impact of a potential shock relating to food security (WFP, 2011). For purpose of providing a comparative tool in studies, an asset wealth has been created by counting the number of different assets owned by each household. Diversity of asset ownership alone cannot be taken as a measure of the entire wealth of the household, but can be considered as a good proxy (WFP, 2011).

## 2. Problem Statement

Women are more vulnerable to individual and household food insecurity (Sharkey et al., 2011). The gendered nature of food related hardships may be related to women being more likely than men living in poverty. They do low paying casual jobs, are responsible for unpaid domestic work such as caring for children and other family members, washing clothes and cleaning the house. Rural women are particularly vulnerable to household food insecurity and its consequences. They have unique characteristics including less education, less chances of employment opportunities while being more likely to be mothers and caring for children (Sharkey et al., 2011). In addition, it is well known fact that women are actively involved in the household food production. However, few studies have been done to highlight their food security status, hence this study sought to fill that gap by focusing on women in the household as the respondents and studying their demographic and socio economic characteristics. There was need, therefore, for this study focusing on women in Mwea West Sub County for determining food security status among the participants. Furthermore, except for national household surveys, no other study on household food security status has been conducted that is specific to the sub county.

## 3. Hypothesis

H<sub>01</sub>: There is no significant difference in mothers socio demographic and /socio economic characteristics in

Kangai and Mutithi locations of Mwea West Sub County.

H<sub>02</sub>: There is no significant relationship between mothers' socio demographic characteristics and food security status in Kangai and Mutithi Locations of Mwea West Sub County, Kenya

#### 4. Methodology

##### 4.1 Research Design, Target Population and Sampling

The survey design was cross sectional in nature and facilitated collection of self-reporting data of the respondents on demographic /socio economic status. The target population in this study included mothers in the households and there were 12,909 households (GOK, 2009). The sampling frame was all mothers with at least one child aged 2 to 5 years. The size of the sample was calculated using the formula proposed by Fisher et al., (1991) as indicated by the formula:

$$N = z^2 (PQ) \div D^2$$

Where: -

N= Desired sample size

Z= Standard normal deviate (1.96) corresponding to 95% confidence interval.

P= Current national prevalence rates for poverty (46%, GoK, 2005),

Q= 1- p which is the national population without poverty, 0.54%

D= degree of accuracy required (0.05)

N= 382 (Add 5% for incomplete data =19)

Total = 401

Probability proportionate to size of population sampling technique was then adopted as suggested by Turner (2003),

Table 06 Number of households and respondents by location (cluster)

<i>Location</i>	<i>Total number of household</i>	<i>Number of respondents</i>
Kangai	5,302	165
Mutithi	7,607	236
Total	12,909	401

Following Turner's guideline and with help of the Village in Charge, the research team approached the community from a market place, and moved from one homestead to the other administering the household questionnaires to the qualified respondents until the number of the respondents allocated to the location was attained.

##### 4.2 Data and Data Methods

The study looked at demographic and socio economic characteristics of the respondents in two locations which are in the same agro ecological zone. Using a researcher administered questionnaire (Appendix 5), several variables were investigated including gender of household head, marital status, religion, education, occupation (sources of income), livestock kept, asset ownership, expenditure on food as well as size of land owned. In addition, an observation was made on type of house (wall, roof, floor) the household had. The Household Food Security Survey Model (HFSSM), a Health Canada Model, (2012), was used to establish the food security status of the households namely: severely insecure, moderately insecure and secure in both dry and wet seasons. The student's t-test ( $\alpha=0.05$ ) was applied to test the hypothesis on whether there was any significance in differences in food security status between locations for the households. Consequently all the independent variables in the study were cross tabulated with food security status to check for their association. Logistical regression was used to determine the most influential variables to food security status and micronutrient intake.

#### 5. Findings

##### 5.1 Demographic and Socio Economic Variables

The t-test was used to test whether there were significant differences between the two locations (Kangai and Mutithi) in regard to all the demographic and socio economic variables used in the study.

Table 7 (t)-test on Demographic Variables

Demographic characteristic	t	Sig. (2-tailed)
Marital status of the woman	2.758	.066
Religion of household head	-2.725	.007
Gender	5.923	.510
Age in years	-5.370	.072
Occupation	10.938	.000
Education	5.350	.000
Type of house wall	-14.165	.000
Type of house floor	.803	.422
sources of income	5.893	.000
land ownership (in acres)	-5.579	.000

Findings show  $p < 0.05$  for occupation, education, type of house wall, and income of household head. The conclusion of t-test was that the demographic and socio economic characteristics in a Kangai and Mutithi are significantly different. The null hypothesis is therefore rejected.

## 5.2 Food Security Status

### 5.2.1 Household's Food Security Status by Location

The household's food security status by location was summarized as shown in Figure 3

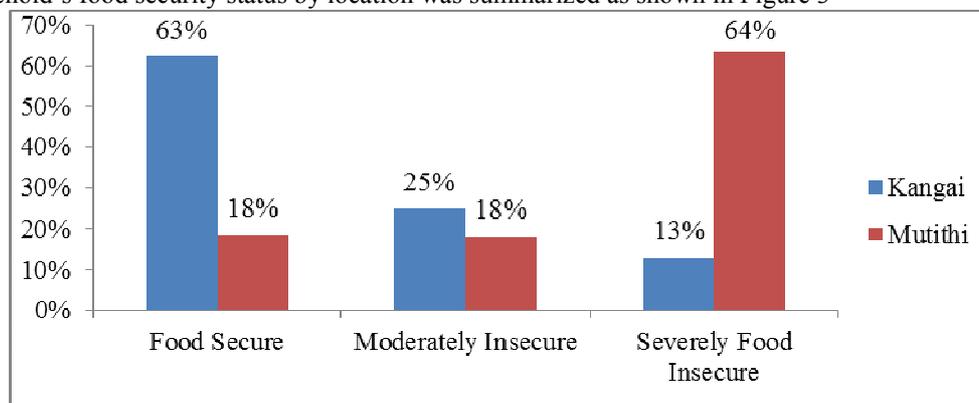


Figure 5 Household's food security status by locations

When comparing household's food security status for Kangai and Mutithi locations by examining anxiety and perceptions, the findings were that more of the Mutithi households (64%) were severely food insecure compared to 13% of the Kangai ones. On the other hand, more of the Kangai households (63%) were food secure compared to only 18% of the Mutithi ones.

### 5.2.2 Overall Households' Food Security Status

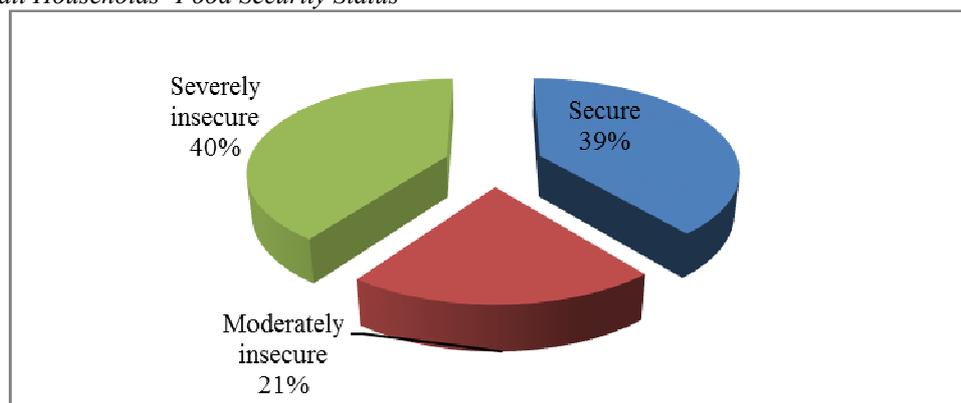


Figure 6 Household's food security status

On the whole, 39% of studied households were food secure, 21% were moderately food insecure while 40% were severely food insecure.

### 5.3 Relationship between Household Food Security Status and social demographic characteristics

#### 5.3.1 Education level of the respondents and household food security status

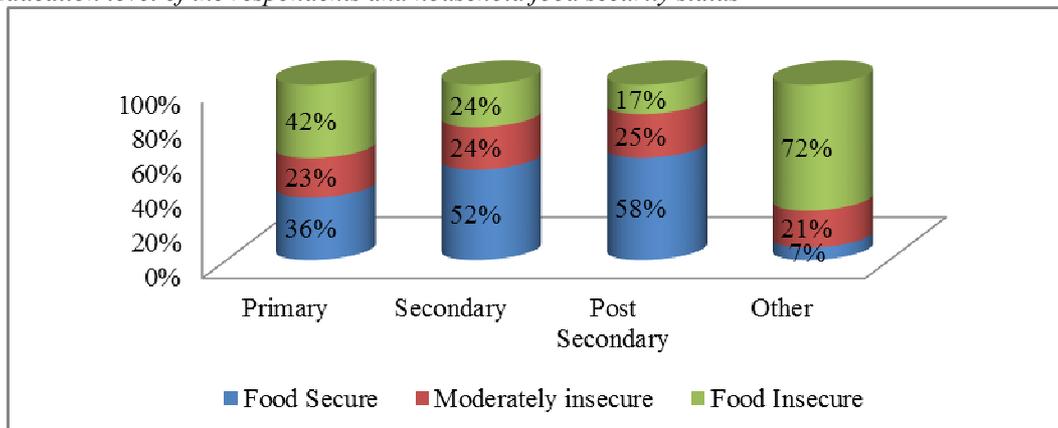


Figure 7 Education Levels of the Respondents by Household Food Security Status

The respondents who were possibly either primary school dropout or did not attend primary school (72%) were severely food insecure. This shows a strong correlation between food insecurity and low level of education. More than half of those who attended post-secondary educations were food secure. These findings tally with those of Kaloi et al., (2005). In their studies “food security status of households in Mwingi District, Kenya”, the researchers found that the level of education of the household head positively correlated with food security status. They argued that an increase in formal education lead to an increase in food security. This is further confirmed by a study on “prevalence of hunger and food insecurity in Rhodes Island “(Department of Health, Division of Family Health, Rhodes Island, 2001 as in Kaloi et al., 2005

#### 5.3.2 Mother’s occupation and Household Food Security Status

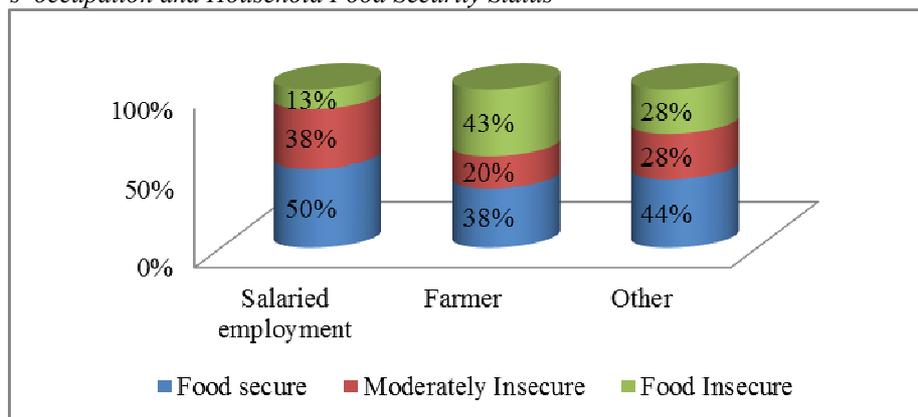


Figure 8 Occupation of the Respondents by household food security status and Micronutrient Intake

The farmers (43%) as well as the casual workers (28%) were the most food insecure. This suggests a strong relationship between source of income and the household food security status. It was noted that the farmer was not quite food secure. A study done in Nepal on food security found that the 85.9 % of the respondents lived on farming (Maharjan 2006).

### 5.3.3 Type of dwelling House and Household Food Security Status

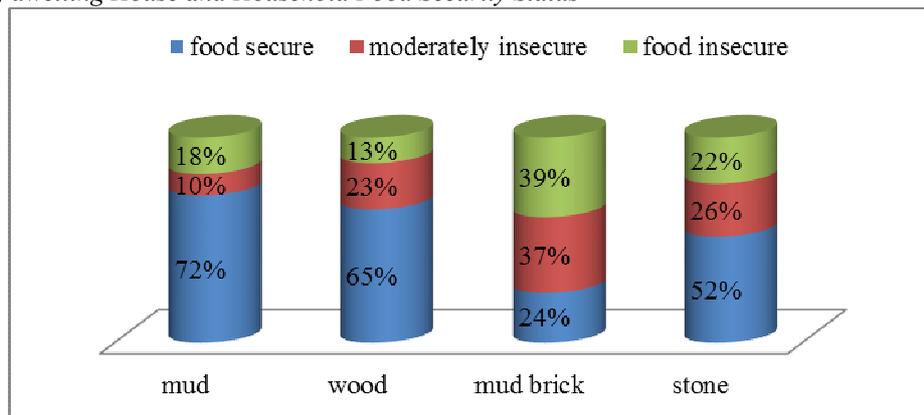


Figure 9 The Relationship of Type of House Wall with Food security status

The type of house a family has especially the wall is an indicator of socio economic status. In this study, majority of the respondents had mud and mud brick walled houses. This predicated poverty as well as food insecurity.

### 5.3.4 Household Assets and Food Security Status

Table 8 Asset ownership by food security status and micronutrient intake

Asset	Food secure		Moderately insecure		Severely food insecure		Total	
	N	%	N	%	N	%	N	%
Car	3	2	1	1	2	2	6	2
Bicycle	95	67	36	53	43	41	174	55
Motorbike	4	3	2	3	5	5	11	3
Radio	37	26	28	41	54	51	119	38
Donkey/oxcart	1	1	0	0	2	2	3	1
Television	2	1	1	1	0	0	3	1
<b>Total</b>	142	100	68	100	106	100	316	100

The findings were that out of 316 respondents, 142 (45%) were food secure, 68(22%) were moderately insecure while 106 (33%) were severely food insecure. It should be noted that the respondents were mothers who we likely not to own the assets. Most assets are owned by men in the households.

### 5.3.5 Mother's income and Food Security Status

Table 9 household income and food security status

Income /month	Food secure		Moderately insecure		Severely food insecure		Total	
	N	%	N	%	N	%	N	%
Below 500	130	92	41	87	78	87	249	89
500-1000	7	5	4	9	11	12	22	8
1001-2000	2	1	2	4	1	1	5	2
2001-3000	0	0	0	0	0	0	0	0
3001-4000	1	1	0	0	0	0	1	0
4001-5000	1	1	0	0	0	0	1	0
5001>	1	1	0	0	0	0	1	0
<b>Total</b>	142	100	47	100	90	100	279	100

The findings were that, 142 (51%) out of the 279 respondents were food secure out of which 130 (92%) had an income of less than Ksh. 500. On the other hand, 47 of the respondents were moderately food insecure out of which the majority 41 (87%) had an income of less than Ksh 500per month. Finally, 90 of the respondents were food insecure out of which 78 (87%) earned less than Ksh 500. This study was done in rural area where majority of the respondents were mothers who depended on farming. In rural set up income can only be obtained after crops have been planted, matured, harvested and then sold for cash. In good season little cash may be needed if enough food is produced, but when rain fails, food insecurity is experienced.

### 5.3.6 Land Owned by Households and Food Security Status

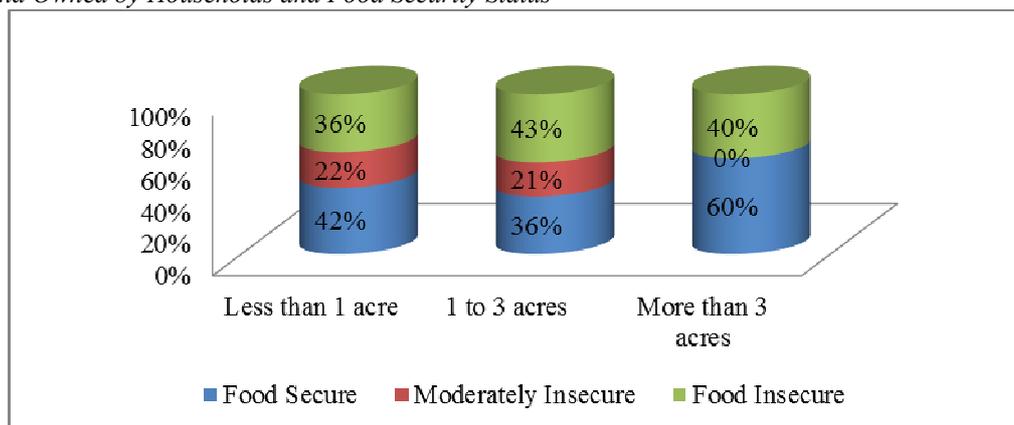


Figure 10 Relationship between Size of Land Owned and household food security status

The findings were that those who had very little land (<0.5ac) were likely to be food insecure. This could mean that the land was too small to be relied on as a source of food. On the other hand, those who had 3 > were also found to be food insecure. This finding was unexpected because food security should increase as the size of land increases. It is assumed that the more land owned, the food is available for the household, even allowing some of the food to be sold for cash to purchase animal source foods ( meats, eggs, milk ) as well as other non-food materials ( soaps , salt ,sugar, cooking oil). However, it could be that the land was unproductive and could not produce enough food. Another explanation could be that the land was too big for an individual to manage without appropriate farming tools.

### 5.3.7 Logistical regression on demographic variables and food security status

Logistical regression test was used to determine the most important demographic and socio economic factors in reference to food security status

Table 10 Demographic Variables and Food Security Status

Model Fitting Information				
Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	311.391			
Final	38.345	273.046	160	.000
Pseudo R-Square				
Cox and Snell			.801	
Nagelkerke			.952	
McFadden			.877	
Likelihood Ratio Tests				
Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	38.345	.000	0	.
Gender of house head	62.717	24.372	2	.000
Marital Status	53.122	14.777	6	.022
Religion	72.758	34.413	8	.063
Age	158.343	119.997	56	.000
Occupation	132.505	94.160	10	.000
Education	78.76	40.422	10	.000
House wall	41.444	3.099	8	.928
House floor	69.147	30.802	2	.000
Income sources	124.184	85.839	10	.000
Expenditure on food	96.469	58.123	8	.000
Land size	114.684	76.339	20	.000

There are many different ways to calculate an R<sup>2</sup> for logistic regression, and no consensus on which one is best. The McFadden R<sup>2</sup>, as Menard (2000) argues, satisfies almost all of Kvalseth's (1985) eight criteria for a good R<sup>2</sup> when the marginal proportion is around 0.5, and is therefore preferred as a better choice (Allison, 2013). The findings therefore show that gender, marital status, religion, age, occupation, education, house construction, income sources, expenditure on food and land size contributed up to 87.7% of the variations in food security

status in the Sub County.

## 6. Conclusion

The socio demographics of the mothers in the two locations were significantly different ( $p < 0.05$ ). Therefore, the null ( $H_{01}$ ) hypothesis was rejected. The house hold food security status for the Sub County was that 39% of households were food secure, 21% were moderately food insecure while 40% were severely food insecure. Gender of the household head, marital status, religion, age, occupation, education, income sources, expenditure on food and land size were the most pronounced proxy indicators for food security status in the Sub County and they underscore the poverty levels in the area. The null hypothesis ( $H_{02}$ ) was therefore rejected. These findings confirm findings of various studies (Esturk, et al 2014; Jones, 2013; USAID, 2013; Temilope, 2012; Kakota et al., 2015, AWSC, 2014)) that poverty is the key cause of household food insecurity. Further research is suggested on possible interventions for food insecurity in the sub county.

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