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The Role of Household Characteristics in Determining Food Security in Kisii Central Sub-County, Kenya

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Abstract
This paper examines the role of household characteristics in determining food security in Kisii sub-County, Kenya. A total of 209 respondents were drawn from three sub-Locations with the highest population densities within the agro-ecological zones of the area. Data was collected using a questionnaire on the following household characteristics; age, gender, marital status, and education level of household heads. Farm size and the amount of land allocated to crop production data were also collected. Food security assessment was based on household head's self-report for a period of 12 months. Descriptive and inferential statistics were used to analyze data and in particular Pearson's Chi-square test was used to determine the relationship between household characteristics and food security. Results indicated that 77.5% of the households were food secure and 22.5% were food insecure. Both the marital status (0.018) and the level of education of the household head (0.000) played a significant role in determining household food security. The other significant characteristics were farm size (0.002) and amount of land allocated to crop production (0.006). This study recommends that farmers be encouraged to acquire formal education and also intensify crop production through adoption of modern farm technologies.
Key words: Household Characteristics, Food Security, Marital Status, Pearson's Chi-square test

1.0 Introduction

Studies that attempt to link household characteristics to household food security have received increased attention over the past few decades and this is due to the realization that components of economic and social status that distinguish and characterize people are significant indicators of food security (Dauda, 2010). According to Scanlan (2003), food insecurity is a complex issue that requires multiple theories and integrative methods to fully explain it. Maxwell and Smith (1992) also argue that household characteristics are crucial and that food security must be treated as a multi-objective phenomenon that is best explained by the food insecure people themselves.

The concept of food security originated in the mid 1970s when the world faced food problems due to the 1972 to 1974 global food crisis. Discussion on food security during that period was focused on national and world food availability and it was not until the 1980s when attention moved to issues of household and individual access to food as well as entitlement (Maxwell and Smith, 1992; Sen, 1981). Food security has been defined as a situation that exists when all people at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food prevalence for an active and healthy life (FAO, 2003). The latest Food and Agricultural Organization (FAO) estimates indicate that global hunger continues to decline although 805 million people in the world today still do not have enough food to lead a healthy active life (FAO, IFAD, WFP, 2014). Positive global trends in the reduction of hunger masks disparities within regions, for example, sub-Saharan Africa still has the highest prevalence of under-nourishment in the world (one person in four) with only modest progress in recent years. Food insecurity denotes hunger and according to the International Food Policy Research Institute (IFPRI), millions of people are food insecure because they cannot afford to buy all the food they need and do not have access to resources to produce it themselves (IFPRI, 2012).

It is estimated that about 86% of rural families depend on small-scale agriculture for their livelihoods and a high proportion of them (>80%) are food insecure (World Bank, 2007; Valdès *et al.,* 2010). The causes of food insecurity and malnutrition are diverse, multi-factorial and interlinked and include among others; conflicts, discrimination, demographic factors and unsustainable resource management (Pinstrup-Anderson, 2009). In the sub-Saharan region poverty and food shortage are the main catalysts of food insecurity and about 48.5% of the people live in poverty which constrains the ability of farming households to invest in productive assets and agricultural technologies resulting in insufficient agricultural productivity (World Bank, 2013; Fosu, 2009). In addition, food crop production is not increasing at a rate necessary to meet population growth currently averaging 2.4% annually across Africa and this food scarcity continues to drive up food prices resulting in food insecurity (Folaranmi, 2012). In sub-Saharan Africa, erratic weather patterns often accompanied by prolonged drought are a major cause of widespread food insecurity, but despite this realization, only 5% of the cropped

land is irrigated in the region compared to 14% in Latin America and 37% in Asia (Ringler *et al,* 2010; Ogallo, *et al.,* 2002).

In Kenya, food insecurity has remained a challenge. For example, between 2004 and 2008 about 33% of Kenya's population experienced chronic food insecurity (FAO, 2005; FAO, 2011). Food insecurity continued to deteriorate and by 2012, about 10 million people were food insecure (IFPRI, 2012; WFP, 2009). Inadequate food availability has been singled out as one of the most important causes of food insecurity and is attributed to among other factors; insufficient domestic production and imports. This has been due to low agricultural productivity and high poverty rate (over 50% below the poverty line) which limits access to food because households have no sufficient means to pay for the required food (Glopolis, 2013; FAO, 2006). Other studies have linked household food security status to household socio-economic factors such as the level of education of household heads, crop yields, household size, amount of land owned and household income among others (Walingo *et al.,* 2009: Volege, 2005). Grimm (2012) also found that factors causing food insecurity in Central and Western highlands of Kenya were multi-dimensional and included high prices of agricultural inputs, poor marketing structures and agricultural practices.

Recent studies show that household food security is a problem in Kisii Central sub-County because only 34% of the population enjoys food security while 23% is faced with chronic food insecurity (Wachira, 2014). Some of the factors contributing to this situation are diminishing land resource due to high population density (1056 persons per square kilometer by 2012), continued sub-division of arable land resulting in reduced average land holdings (about 0.5 hectares), a poverty level of about 54.2% which is associated with negative influence on agricultural production and income levels (Kisii Central District, 2009: Kisii County, 2013).

2.0 Methodology

2.1 Study Area and Sampling

Kisii Central sub-County is located in Kisii County in the Western Highlands of Kenya. It lies between latitudes $0^0$30' and $0^0$58' south, longitudes $34^0$42' and $35^0$05' East. It occupies a total area of 361.0 km^2 (Kisii Central District, 2008). Kisii Central sub-County is a highland region with most of its area lying between 1500m and 1800m above sea level with mild temperatures of 18^0C - 21^0C (Jaetzold *et al*., 2009). Average rainfall ranges between 1200mm to about 2400mm per annum. The main agro-ecological zones are the Lower Highland (LH) and Upper Midland (UM) with a few of their subzones, about 75% of the area is a Coffee-Tea zone (UM_1) (Jaetzold *et al.,* 2009). The area's population was expected to grow at 2.72% to reach 381,159 by 2012 with a density of 1056 persons per Km^2 and household size of 5 persons (Kisii Central District, 2008). Mixed farming is the main economic activity and over 80% of the agricultural land is devoted to the growth of food and cash crops mainly maize, finger millet, sorghum, beans, sweet potatoes, tea, coffee and sugarcane (Kisii Central District, 2008).

The sampling frame comprised all rural farm households in Kisii Central sub-County within LH_1, UM_1 and LM_2 agro-ecological zones. The sub-Location with the highest population density within each agro-ecological zone was selected and a sample of 209 household heads was picked randomly.

2.2 Sources of Data

Household heads provided information on their age, gender, marital status and level of education. They also provided data on farm size and amount of land allocated to crop production. Data on household food security was collected based on self-report by household heads in reference to the Experience-based Method (Amaza *et al.,* 2009).

2.3 Data Analysis

Data was analyzed using both descriptive and inferential techniques. The first step involved generation of statistical summaries namely percentages and means. Tables were then constructed to present the results. Pearson's Chi-square test (Yates, *et al.*, 1999) was used to test the impact of household characteristics on household food security. Only Chi-square values significant at ≤ 0.05 were considered as representing significant relationships between variables

3.0 Results and Discussion

3.1 Household Characteristics and their Role in Determining Food Security

This section presents results and discussions of household characteristics and their role in determining household food security in the study area (as shown in Table 1 and 2). Age is an important characteristic that influences management and distribution of roles in a household. This is because age defines the various roles played by different household members and has an impact on decision-making especially in relation to land use and food security. Respondents were aged between 21 and 78 years with a mean age 43.98 years. Distribution of age categories among the sample population showed that 12% of the household heads were between 21-30 years, and majority were aged between 30 and 50 years of age (59.3%). These results compare favourably with those of Ogeto *et al.,* (2013) who found that majority of the farmers in Nakuru County were aged between 30 to 59 years with an average age of 43 years. In addition, studies conducted in Uganda and Malawi showed that the average

age for household heads in farming communities was 40 years and 41.1 years respectively (Turyahabwe *et al.,* 2013; Nyambose and Jumbe, 2013). The low proportion of household heads aged between 21 and 30 years of age may be due to the fact that these are young people who probably might still be in college and had not established their own households.

Analysis of the relationship between household food security and age showed that 80% of the households headed by people aged between 21-30 years were food secure, the proportion of food secure households declined to 59% for the 31-40 year age category, then increased to 73% for those aged between 41 and 50 years. Although household food security seemed to decline with increase in the age of the respondents, this relationship was not consistent therefore, the role of age in determining household food security was not clear. Other research findings have demonstrated this inconsistency, for example, the age of the household head has a significant impact on food security and according to Babatunde *et al.,* (2007) young and energetic household heads are expected to cultivate larger farms compared to older and weaker ones, seek and obtain off-farm jobs to improve their food security status. On the other hand, Arene and Anyaeji (2010) found older household heads to be more food secure than the younger ones because they are more knowledgeable in farming activities. The Chi-square results indicated that age had no significant (0.278) impact on household food security. These findings agree with those of Nata *et al.,*(2014) which showed that the age of a household head did not have a significant influence on the adoption of either soil improving practices nor household food security in Ghana.

The gender of the household head is an important factor in households because it influences farm organization and income earning opportunities of a household which in turn determines household food security. The results of the study indicated that 81.3% of the households were headed by males and 18.7% by females. This showed that there were more male headed households than the female headed ones, a situation reflected in most rural areas in Kenya where 70% of the households are male headed while 30% are female headed (KNBS, 2007). The slightly higher incidence of male heads in farming households in the study area as compared to the national proportion could be due to the fact that there are limited employment opportunities in other economic sectors therefore male household heads find farm activities as a viable livelihood alternative. This explanation agrees with that of FAO (2003) that in sub-Saharan Africa more women household heads (31%) are found where the male family members leave the rural households to try and find waged labour in urban centers to increase family income.

A large proportion of male headed households were food secure (68.8%) compared to female headed ones (53.8%) which implies that households headed by males had a higher likelihood of being food secure than those headed by females. These findings were supported by a study in Kenya by Kassie *et al.,* (2012), which found that female headed households are 13% less likely to be food secure than male headed households. Despite these findings, the role of gender in determining household food security in the study area was found to be insignificant at 0.075. These results contrasted those by Yengoh (2012) who found that female managed farms recorded lower yields compared to male managed ones in small-scale food crop farming systems in Cameroon. The differences in yields was due to variations in the use of factors of production (inputs and management) where more than 85% of the males used inorganic fertilizers in crop production compared to 54% of the females.

Household headship is often defined as a source of authority which is determined by culture and economic contribution to the household among other factors. In the study area, however, female headship is complicated by the fact that only males are allowed to inherit land and this situation makes females unwilling to own up as household heads, even where they are. The result is that, there is unequal participation of women and men in socio-economic activities and this gender disparity affects women in terms of control, ownership and accessibility to productive resources and participation in decision making them vulnerable to food insecurity (Kisii County, 2013).

A household's economic stability largely depends on the contribution of household members in terms of labour and participation in off-farm income generating activities. A large proportion of household heads were married (93.8%) while 2.4% and 3.8% were single and widowed respectively implying that most farms were managed by married couples. These findings compare well with those of Kiprono (2013) which showed that 83.7% of smallholder tea farmers in Kenya were married. The relationship between the marital status of the household head and food security was as follows; 68.4% of the households whose heads were married were food secure, 40% of those households headed by singles and 25% of those headed by widows were also food secure. This implies that households heads who were married had a higher likelihood of being food secure. It is therefore implied that both the husband and wife contribute their labour and other resources to improve the household food security. According to Yusuf *et al.,* (2015), married household heads have a higher incidence of food security compared to single, divorced and widowed heads. This could be attributed to the fact that married household heads are likely to have larger households which are engaged in income generating activities, therefore, contributing more to household income compared to households headed by either singles or widowed.

The marital status of the household head was found to have a significant role in determining household food security (0.018). This finding is supported by other studies that have also found that a household head's marital

status has a positive and significant association with household food security (Haile *et al.,* 2005 and Kaloi *et al.,* 2005) which indicates that married couples were likely to be more food secure than single or widowed headed households. While confirming the significance of marital status on household food security in Ghana, Aidoo *et al.,*(2013), argues that households headed by unmarried people were likely to be food secure than those headed by married ones. This is because households with married people may have larger households and this means many mouths to feed.

The education level of a household head is significant in a household, it may determine the absorption of extension information, the type of off-farm employment one can undertake and the income earned. These, in turn, influence access to food, land and other resources. Results from the study indicated that 5.7% of the household heads had no formal education, 45.9% had attained primary level of education, and 39.7% had secondary level of education while a small proportion (8.6%) had post-secondary education. This implies that most of the farmers were literate and had attained primary and secondary level of education (85.6%). These findings are comparable with those of Kiprono (2013) who found that majority (80.6%) of the tea farmers in Kenya had attained secondary school education.

Household heads with no formal education had very low incidences of food security (25%) and as the level of education of household heads increased to primary, the proportion of food secure households increased to 58.3%, then to 78.3% for those with secondary education and finally to 77.8% for those whose household heads had attained post-secondary education. According to Kirimi *et al.,* (2013), the level of education of the household head has a positive relationship with household food security. This is because education enhances skills and ability to make decisions which can enable access to better economic opportunities or better utilization of information including use of technology and farming practices to improve agricultural production hence food security. The relationship between the education level of the household head and household food security was found to be significant at 0.000 implying that education had a strong and positive role in determining household food security. These findings compare favourably with those of several studies which indicated that the years of formal education were significantly related to household food security (Asogwa & Umeh, 2012; Olayemi, 2012). According to Kumba *et al.,* (2015a), more educated farmers in the study area were found to engage in cash crop production compared to less educated ones, and this boosted their food security status.

The distribution of farm sizes among households was as follows; 20.1% owned to less than 1 acre, 48.3% owned between 1.0 and 2.0 acres and 31.6% owned over 2.0 acres. The average farm size was 2.08 acres. This implies that most households (68.4%) owned less than the average farm size. These results confirm those of Pender *et al.,* (2006), who found that as a consequence of high population densities, farm sizes in the western highlands of Kenya are small ranging between 0.6 hectares (1.5 acres) and 1 hectare, and that most farms are less than 0.5 hectares in many parts of the region.

Households who owned less than one acre were had a lower proportion of their households food secure (47.6%) compared to those with 1- 2 acres (64.4%) while the ones with over 2 acres of land had the highest proportion of food secure households (80.3%). This shows that household food security improved with increase in farm size. The reason could be that households with larger farms are able to diversify their agricultural activities to improve food security, for example, according to Kumba *et al.,* (2015_a), a large percentage of households in the study area who owned less than one acre (97.6%) were involved mainly in food production while those with higher acreage were engaged in both food and cash crop production which increased their chances of being food secure. This relationship was found to be significant at 0.006 implying that households with larger farms had a higher probability of being food secure. These findings confirm those of Esenu (2005) who found that the amount of land owned by households had a positive impact on food availability in Teso farming systems. Haile *et al* (2005) also found that farm size was positively and significantly related to the probability of a household being food secure in Ethiopia and that this probability increased by 6% for every increase of one hectare of farm size.

The amount of land allocated to crop production is also an important indicator of household food security. Results indicated that 33.5% of households had allocated less than 1acre of land for crop production, 40.2% had allocated between 1-2 acres while 26.3% had allocated over 2 acres. This means that majority of the households (73.7%) allocated most of their land for crop production considering that the average farm size in the study area was slightly over 2 acres. These findings concur with those of Kumba *et al.,* (2015_b) which showed that over 90% of the arable land in Kisii Central sub-County was devoted to crop production (food and cash crops).

Data analysis showed that 51.4% of the households who had allocated less than 1 acre to crop production were food secure while 48.6% were food insecure. As allocation to crop production increased to 1-2 acres the proportion of food secure households increased to 71.4% then to 76.4% for those who had allocated over 2 acres. This shows that the amount of land allocated to crop production had a positive impact on household food security. The reason may be because most of the land allocated to crop production is used for food crop cultivation, therefore, increasing households' likelihood of being food secure from own production. This view is supported by Eunice *et al.,* (2000) who asserts that where more land is brought under cultivation, holding other factors constant, more production is expected leading to more food security. There was a positive and significant

relationship (0.006) between land allocated to crop production and household food security. These results concur with those of Lang'at *et al.,*(2011) who found that the ratio of land allocated to crop production (tea) significantly influenced household food security in Nandi South, Kenya. Kirimi *et al.,* (2013) also argue that access to more land for cultivation would get households out of risky food security situations.

3.2 Household Food Security

Analysis of the household food situation in the study area showed that 77.5% of the households were food secure while 22.5% were food insecure. These findings compare well with other studies conducted in Kenya, for example, Kaloi *et al.* (2005) found that 62% of the households in Mwingi district, Kenya were food secure while 38% were not.

4.0 Conclusion and Recommendation

The study shows that majority (77.5%) of households in Kisii Central sub-County were food secure. Households headed by married people who had attained higher education had a higher probability of being food secure. Farm size and the amount of land allocated to crop production also had a positive and significant role in household food security. This study recommends that rural populations be encouraged to acquire formal education through increased school enrolment and participation in adult literacy programmes. Households should also be encouraged to intensify crop production by adopting new farming technologies.

5.0 References

Aidoo, R., Mensah, J.O., & Tauffuor, T., (2013). Determinants of Household Food Security in the Sekyere-Afram Plains District of Ghana. Paper presented to the 1st Annual International Interdisciplinary Conference, AIIC 2013, 24,-26 April, Azores, Portugal.

Amaza, P., Abdoulaye, T., Kwaghe, P., & Tegbarn, A., (2009). Changes in household Food Security and Poverty Status in PROSAB area of Southern Borno State, Nigeria. International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria.

Arene, C. J., & Anyaeji, J., (2010). Determinants of Food Security among Households in Nsukka Metropolis of Enugu State, Nigeria. Pakistan. *Journal of Social Sciences* 30(1):9-16.

Asogwa B. C., Umeh J.C., (2012). Food insecurity determinants among rural farm households in Nigeria. Proceedings of International Conference on Ecology, Agriculture and Chemical Engineering (ICEACS) 2012, Phuket (Thailand), December 18th - 19th, 2012.

Babatunde, R. O., Omotesho, O.A. & Sholotan, O.S. (2007). Factors Influencing Food Security Status of Rural Farming Households in North Central Nigeria. Agricultural Journal 2(3) 351-357.

Cruz, L. (2010). Responsible Governance of Land Tenure. An Essential Factor for the Realization of the Right to Food. Land Tenure Working Group Discussion Paper 15, FAO. Rome.

Dauda, R.O.S., (2010). Women's Status, Household Food Security and Coping Strategies in Nigeria: A Survey Based Analysis. Pakistan *Journal of Social Sciences* 7 (3):262-268.

Esenu, N.B. (2005). Gender Relations in Livestock Production and Ownership: Implications for Household Food Security in Teso Farming Systems. Msc Thesis in Agricultural Economics, Makerere University.

Eunice, O., Doppler, W., Patrick, M.K., (2000). Pillars of Food Security in Rural Areas of Nigeria. International Institute of Tropical Agriculture. Ibadan, Nigeria

FAO, IFAD & WFP (2014). The State of Food Insecurity in the World 2014. Strengthening FAO, Rome.

FAO, (2011). Gender: Food and Agriculture Programme Organization programme. http://www.fao.org/gender/gender -home/genderprogramme/gender- food/en/ Date of access: 17 October. 2013.

FAO (2006). The State of Food and Agriculture 2006. Food Aid for Food Security? Food and Agriculture Organization of the United Nations, Rome.

FAO, (2005). The State of Food and Agriculture. Food and Agriculture Organization, Rome.

FAO (2003). The State of Food Insecurity in the World 2003. FAO, Rome

Folaranmi, T. (2012). Food Insecurity and Malnutrition in Africa: Current Trends, Causes and Consequences. www.consultancyafrica.com/i..ssion-papers&Itemid=268

Fosu, A.K. (2009). Inequality and the Impact of Growth on Poverty: Comparative Evidence for sub-Saharan Africa. *Development Studies*, 45(5):726-45.

Glopolis, (2013). Food Security and Agricultural trade in Kenya. The Impact of the Economic Partnership Agreement (EPA) on Food Security of Poor Kenyans. Prague Global Policy Institute-Glopolis.

Grimm, O., (2012). Understanding Spatial Patterns of Food Insecurity in Kenya as a Contribution to Sustainable Rural Development Policies. M (Phil) Thesis. Center for Development and Environment, University of Berne.

Haile, H. K., Alema, Z. G., & Kudhlande, G., (2005). Causes of Household Food Insecurity in Koredegaga Peasant Association, Oromiya Zone, Ethiopia. Working Paper, Department of Agricultural Economics, University of Free State, South Africa.

IFPRI, (2012). Annual Report. International Food Policy Research Institute. Washington DC.

Jaetzold, R., Schmidt, H., Hornetz, B., & Shisanya, C., (2009). Farm Management Handbook of Kenya Vol. II: National Conditions and Farm Management Information. 2nd Edition Part A West Kenya Sub-part A2 Nyanza Province.

Kaloi, E., Tayebwa, B., & Bashaasha, B., (2005). Food Security Status of Households in Mwingi District, Kenya. *African Crop Science Conference Proceedings*, 7:867-873.

Kassie, M., Ndiritu, S. W. & Shiferaw, B. (2012). Determinants of Food Security in Kenya, a Gender Perspective. www.ageconsearch.umn.edu/...12%2520conference.pdf

Kiprono, P. (2013). Socio-Economic Impact of Climate Change on Smallholder Tea Farming in Kenya: A Baseline Survey. www.fao.org/fileadmin/templa...10-Economics_Survey.pdf

Kirimi, L., Gitau, R., & Olunga, M., (2013). Household Food Security and Commercialization among Smallholder Farmers in Kenya. www.ageconsearch.umn.edu/...0Millicent%20Olunga.pdf

Kisii Central District (2008). 2007 Crops Development Annual Report. Ministry of Agriculture, Kenya.

Kisii Central District (2009). Kisii Central District Development Plan 2008-2012. Office of the Prime Minister, Ministry of State for Planning, National Development and Vision 2030.

Kisii County (2013). The First County Integrated Development Plan 2013-2017. Kisii County Government.

Kisii County (2013). The First County Integrated Development Plan 2013-2017. Kisii County Government.

KNBS, (2007). Kenya Integrated Household Budget Survey 2005/2006. Ministry of Planning and National Development

Kumba, J. K., Wegulo, F. & Otieno, J., (2015a). The Influence of Agricultural Land Use on Household Food Security Situation in Kisii Central sub-County, Kenya. *Economics and Sustainable Development* 6(6):147 - 152

Kumba, J. K., Wegulo, F. & Otieno, J., (2015b). The Impact of Socio-Economic Characteristics on Cash and Food Crop Production: Implications on Household Food Situation in Kisii Central sub-County, Kenya. *Developing Country Studies.* 5(5):115-122

Langat, B.K., Sulo, T.K., Nyangweso, P.M., Ngeno, V.K., Korir, M.K., and Kipsat, M.J., (2011). Household Food Security in a Commercialized Subsistence Economy: A Case of Smallholder Tea Farmers in Nandi South District, Kenya. *Journal of Development and Agricultural Economics* 3 (5):201-209.

Maxwell, S., & Smith (1992). Household Food Security: A Conceptual Review. Institute of Development Studies, University of Sussex, Brighton, U.K. Mimeo.

Nata, J.T., Mjelde, J.W. & Boadu, F.O. (2014). Household Adoption of Soil-improving Practices and Food Insecurity in Ghana. *Agriculture and Food Security*. 3:17

Nyambose, W., & Jumbe, C. B., (2013). Does Conservation Agriculture Enhance Household Food Security? Evidence from Smallholder Farmers in Nichotakota in Malawi. www.ageconsearch.umn.edu/...5%20B.L.%20Jumbe.pdf

Ogallo, *et al.,* (2002). "Factors Affecting Food Availability and Access," Greater Horn of Africa Food Security Bulletin, issue no 7, http://reliefweb.int.

Ogeto, R.M., Cheruiyot, E., Mshenga, P. & Onyari, N.C. (2013). Sorghum Production for Food Security: A Socio-Economic Analysis of Sorghum Production in Nakuru County, Kenya. *African Journal of Agricultural Research*. 8(47):6055-6067

Olayemi, A.O., (2012). "Effects of Family Size on Household Food Security in Osun State, Nigeria", *Asian Journal of Agriculture and Rural Development,* 2(2):136-141.

Pender, J., Place, F. & Ehui, S.,(2006). Strategies for Sustainable Land Management in the East African Highlands. www.ifpri.org/sites/default/files/publications/oc53.pdf

Ringeler, C., Zhu, T., Cai, X., Koo, J. & Wang, D. (2010). Climate Change Impacts on Food Security in sub-Saharan Africa: Insights from Comprehensive Climate Change Scenarios, IFPRI Discussion Paper No. 1042 Washington DC: I…

Scanlan S. J., (2003). Food Security and Comparative Sociology: Research, Theories, and Concepts. *International Journal of Sociology*. 33(3).

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

Turyahabwe, N., Kakuru, W., Tweheyo, M., & Tumusiime, D. M., (2013). Contribution of Wetland Resources to Household Food Security in Uganda. *Agriculture and Food Security.* 2(5)

Volege, M. I.,(2005). Measuring Food Security: Identifying Indicators for Monitoring and Evaluation of a Food Security Project in Vihiga District, Kenya Msc Thesis, College of Agriculture and Veterinary Services, University of Nairobi.

Wachira, (2014).Kisii Joins Turkana on List of Food Insecure Counties. www.knowledgebylanes.co.ke/??P=21883

Walingo, M. K., Liwenga T.E., Kangalawe, Y.M.R., Madulu, F.N., & Kabumbuli, R., (2009). Perceived Impact of Land Use Changes and Livelihood Diversification Strategies of Communities in Lake Victoria basin of Kenya. *Journal of Agricultural Biotechnology and Sustainable Development* 1(3):069-078.

WFP (2009). Kenya Food Security Update. World Food Program, New York.

World Bank (2007). World Development Report 2008: Agriculture for Development. Washington D.C: World Bank.

World Bank (2013). Working for a World Free of Poverty. Washington DC, World Bank.

Yates, D., Moore, D. & McCabe, G., (1999). The Practice of Statistics. (1st Ed.). New York: W.H. Freeman.

Yengoh, G. T. (2012). Determinants of Yield Differences in Small Scale Food Crop Farming Systems in Cameroon. *Agriculture and Food Security* 1:19

Yusuf, S.A., Balogun, O. L., & Falegbe, O. E., (2015). Effect of Urban Household Farming on Food Security Status in IBADAN Metropolis, Oyo State, Nigeria. *Agricultural Sciences.* 60(1):61-75

Pinstrup-Anderson P., (2009). "Food Security: Definition and Measurement". Springer Science + Business Media B. V. & International Society for Plant Pathology. *Food Science*, 1: 5-7.

Valdes, A. Foster, W., Anriquez, G. Azzarri, C., Covarrubias, K., Davis, B., DiGiuseppe, S., Essam, T., Hertz, T., Paula de la, A., O., Quinones, E., Stamoulis, K., Winters, P., & Zezza, A., (2010). *A Profile of the Rural Poor*. A Background Paper for IFAD Rural Poverty Report. IFAD. Rome. http://www.ifad.org/rural/rpr2010/background/2.pdf

Table 1: Household Characteristics and Household Food Security

Characteristics	Frequency (N=209)	Percentage (%)	Food Security	
			Food Secure	Food Insecure
Age				
21 - 30	25	12.0	80.0	20.0
31 - 40	61	29.2	59.0	41.0
41 - 50	63	30.1	73.0	27.0
51 - 60	49	23.4	61.2	38.8
61 - 70	8	3.8	50.0	50.0
71 - 80	3	1.4	66.7	33.3
Gender				
Male	170	81.3	68.8	31.3
Female	39	18.7	53.8	46.8
Marital Status				
Married	196	93.8	68.4	31.6
Single	5	2.4	40.0	60.0
Widowed	8	3.8	25.0	75.0
Level of Education				
No formal education	12	5.7	25.0	75.0
Primary	96	45.9	58.3	41.7
Secondary	83	39.7	78.3	21.7
Post-Secondary	18	8.6	77.8	22.2
Farm Size				
< 1 acre	42	20.1	47.6	52.4
1 - 2 acres	101	48.3	64.4	35.6
> 2 acres	66	31.6	80.3	19.7
Crop Production				
< 1 acre	70	33.5	51.4	48.6
1 - 2 acres	84	40.2	71.4	28.6
> 2 acres	55	26.3	76.4	23.6

Table 2: The Role of Household Characteristics in Determining Food Security

Characteristics	**χ^2Value**	***df***	**Significance**
Age	6.305	5	0.278
Gender	3.175	1	0.075
Marital Status	7.992	2	0.018*
Level of Education	18.232	3	0.000*
Farm Size	12.467	2	0.002*
Amount of Land allocated to crop production	10.363	2	0.006*

*Significant at ≤ 0.05

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