Developing Country Studies
ISSN 2224-607X (Paper) ISSN 2225-0565 (Online)
Vol.5, No.5, 2015

The Impact of Socio-Economic Characteristics on Cash and Food Crop Production: Implications on Household Food Situation in Kisii Central Sub-County, Kenya

Janepha K. Kumba[1] Francis Wegulo[1] Joseph Otieno[2]
1.Department of Geography, Egerton University ,P.O. Box 536-20115, Egerton, Kenya
2.Department of Humanities and Social Sciences, University of Kabianga ,P.O. Box 2030-20200, Kericho, Kenya
*Email of corresponding author: kemuntokumba@yahoo.com

Abstract
Socio-economic characteristics of households have significant implications on decisions related to utilization of household farms in order to meet food and non-food needs. This paper aims to establish the impact of socio-economic characteristics on cash and food production and the resultant household food situation in Kisii Central sub-County, Kenya. A structured questionnaire was used to collect data from 209 household heads drawn from three sub-Locations with the highest population density within the LM_1, UM_1 and LM_2 agro-ecological zones. Data on gender and education level of the household heads, household size, farm size and household income was collected. The cash and food crop production data collected was the number of households involved in their production and the amount of land allocated to each activity. Assessment of the food situation was based on self-report by household heads in relation to levels of food availability within a period of one year. Descriptive and inferential techniques were used in data analysis and in particular, Pearson's Chi-square test was used to analyze the impact of socio-economic characteristics on cash and food crop production and household food situation. The level of education of the household head (0.021) and household income (0.019) had significant impact on the food situation of households engaged in both cash and food crop production. Farm size had an impact on households engaged in food crop production (0.001). Most households were found to be food secure (77.5%). This study recommends that rural populations be encouraged to acquire formal education. Household income levels should also be enhanced through investment in value addition and establishment of cottage industries.
Keywords: Cash and food crop production, Household socio-economic characteristics, Food situation

1.0 Introduction

Decision-making in agriculture is complex, and in particular those decisions related to utilization of household farms in order to meet food and non-food needs. How a farmer rations his or her land among different activities depends on the socio-economic environment in which he or she operates, his or her aspirations, needs and knowledge (IIbery, 1978). Cash crops are an intergral part of strategies to improve food security as they enable farmers and farm workers to improve their living standards, thus contributing to food security. This is because income from cash crops offers households opportunities for investment and improvement of management of their farms, stimulating agricultural innovations thereby increasing yields (Achterbosch *et al.,* 2014). However, household food security also requires adequate home production of food, therefore, the ability of a household to command adequate food resources through self-production is important (Ruel and Levin, 2001). In Africa most cropland is used for the cultivation of food crops mainly cereals (maize) and root crops. Although cash crops may contribute to food security through generation of foreign currency and income which could be used to import food or invest in domestic production, this in itself is not sufficient to improve food security (Achterbosch *et al.,* 2014). Moreover, adoption of cash crop production by small-scale farmers is not always guaranteed because of factors such as their level of risk aversion, education level, sufficient assets (land and non-land) and availability of local markets to purchase food (Schneider and Gugerty, 2010).

The latest report on global hunger indicates that about 805 million people were estimated to be chronically undernourished between 2012 and 2014, a decline from more than 100 million over the last decade (FAO, IFAD, WFP, 2014). Despite this improvement, sub-Saharan Africa has not performed well since it is associated with the highest prevalence of undernourishment in the world (one in four people). A major cause of food insecurity in sub-Saharan Africa is inadequate food production due to declining arable land per person (0.25 ha. to 0.08 ha.) mainly as a result of population growth and land degradation (Uploff, 2012). Poverty also is a cause which has a double impact on household food security; it not only reduces the capacity of households to access farm inputs due to capital limitations thus hindering increased food production, but also prevents households from accessing food because of their low or non-existent purchasing power (Nyangweso *et al.,* 2011). About 48.5% people live in poverty in sub-Saharan Africa (World Bank, 2013).

Small-scale farming households in Kenya devote most of their farms (75- 90%) to food crop production although this has not improved rural livelihoods (Omamo, 1998). According to Gladwin *et al.,* (2001), problems

of food insecurity, lack of income and unemployment have all been attributed to small-scale farmers' dedicating most of their land to the production of food crops such as cereals. Adoption of cash crops by small-scale farmers is therefore seen as a strategy for reducing hunger and poverty in Kenya and this is because cash crops are viewed as having the potential to generate income that could be used to invest in inputs that could increase agricultural output (Govereh and Jayne, 2003). Despite these efforts, Kenya still faces food insecurity and in 2007 about 47.2% of people in the rural areas had food consumption levels that were insufficient to meet their basic daily energy requirement (KNBS, 2007). In the following year, about 1.3 million people in the rural areas and 3.5 - 4.0 million in the urban areas were food insecure and this number has increased to 10 million in the past few years (IFPRI, 2012; WFP, 2009). Inadequate food availability has been attributed to among other causes, insufficient domestic production and imports. This has been due to low productivity and poverty (over 50% below the poverty line) which limits access to food because households have no means to pay for food (Glopolis, 2013; FAO, 2006).

According to Jaetzold *et al.,* (2009), most of the land in the study area is used for the production of food crops followed by cash crops. The main food crops are maize and beans while tea is the most preferred cash crop. Other important crops include coffee, sugarcane, napier grass and bananas. This implies that food production is the first choice for land in the area which demonstrates the need for households to be food secure through their own production (Kisii Central District, 2009). Despite this, household food insecurity in Kisii Central sub-County is worrying because about 60% of the population is associated with food poverty (Kisii County, 2013). This situation has been attributed to many factors among them diminishing land resource due to high population density (1056 persons per square kilometer), reduction of arable land due to continued sub-division resulting in average land holdings of about 0.5 hectares for families of five people (Kisii Central District, 2009). Kisii Central sub-County is also associated with a high poverty level (54.2%) which has a negative influence on agricultural production and household food security (Kisii County, 2013).

The objective of this study was to establish the impact of socio-economic characteristics on cash and food crop production and their implication on household food situation in Kisii Central, sub-County. This is because efficient utilization of land resources will enable households to produce as much food and/or income as possible to improve access to food.

2.0 Methodology

2.1 Location and Sampling Techniques

Kisii Central sub-County is located in Kisii County in the former Nyanza province 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 and 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 (Kisii Central District, 2008). 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 households was picked randomly.

2.2 Sources of Data

Household heads were the focal point of this research. They provided information on following socio-economic characteristics; gender and education level of the household head, household size, farm size and household income. Cash production data collected included the total number of households engaged in cash and food production and the amount of land allocated for the cultivation of the following cash and food crops; tea, coffee, sugarcane, maize, beans, bananas, sorghum, finger millet and sweet potato. Data on household food situation 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 frequencies, percentages and means. Tables were then constructed to present the results. Pearson's Chi-square test (Yates, *et al.*, 1999) was used to analyze the impact of the socio-economic characteristics on cash and food crop production and household food situation. Only Chi-square values significant at ≤ 0.05 were considered as

representing significant relationships.

3.0 Results and Discussion

3.1 Cash and Food Crop Production

Allocation of agricultural land to cash and food production was varied. Cash crops were allocated about 25% of the crop land while food crop production took the largest share of farm land (about 65%). These findings corroborate those of Conelly and Chaiken (2000) who found that typical small scale farming households in Kenya devote 10-25% of their land to cash crops and the remaining portion to the food crops such as maize, beans and potatoes. Tea was the most prevalent and was grown by 60.3% of the households on average field sizes of 0.37 acres followed by coffee (32.1%) and then sugarcane (24.4%). Food crop production was conducted on field sizes ranging from 0.01-3.5 acres. Maize was the most popular food crop grown by 98.0% of the households. Maize is a primary stable food in the study area and its availability and abundance determines the level of food security at the household level. In Kenya, maize accounts for 20% of the agricultural production and contributes 68% of daily per capita cereal consumption (Shroeder *et al.,* 2013). More than 85% of the income earned by households was from agriculture mainly from tea and maize.

3.2 The Impact of Socio-economic Characteristics on Cash and Food Crop Production and Household Food Situation

The results of the study are presented in Table 1 and 2. Analysis of the gender characteristic showed that (81.3%) of the household heads were males while 18.7% were females. These results show that there were more male headed households compared to the female headed ones, a scenario that is slightly different from the average Kenyan rural situation where 70% of the households are headed by males and 30% by females (KNBS, 2007). Research shows that variation in household headship depends on the economic potential of an area, and that incidences of female headed households seem to be high in areas of low agricultural productivity (Chipande, 1987). This was confirmed by a study in the marginal areas of Homa Bay and Rachuonyo sub-Counties (with low agricultural potential) that showed a high incidence (46%) of female headed households a situation attributable to male labour migration (Auma *et al*., 2010). Kisii Central sub-County has a high proportion of male headed households probably because it is a high agricultural potential area capable of providing males with viable livelihoods instead of migrating to other areas in search of employment. Results indicated that a large proportion of male headed households were engaged in cash crop farming (81.2%) compared to female headed ones (61.5%). On the other hand, all female headed households were engaged in food production (100%). Evidence shows that female participation in cash production is lower than that of males and a distinction is made in literature that cash crops and export crops are male crops while subsistence crops are female crops (Koopman, 1993; Kumar, 1987). The reason given is that women are responsible for feeding the family while the role of men is to provide cash income (Doss, 2001).

A large proportion of male headed households which cultivated cash crops (73.2%) were food secure compared to 66.7% of the female headed households. In regard to food crop production, 69.5% of male headed households were food secure compared to 53.8% of female headed households. The implication is that male headed households who had cultivated cash and food crops had a higher likelihood of being food secure compared to female headed households. These results agree with those of Omonona and Agoi, (2007) who found that female headed households were more food insecure compared to male headed ones. However, gender was found to have no impact on food situation of households who had cultivated either cash (0.51) or food crops (0.063). These findings are supported by Mallick and Rafi (2010) who found no significant differences in food security between male headed and female headed households among the indigenous ethnic groups in Bangladesh. The reason why gender had no significant impact on household food situation in the study area may be because there was no marked variation in proportion of male or female headed households engaged in food production.

Household heads had attained the following levels of education; 45.9% had primary education, 39.7% had secondary education, 8.6% had post-secondary education level and the rest had no formal education. Most household heads had attained primary and secondary level of education (85.6%). These findings were confirmed by Ogeto *et al.,* (2013) who found that majority (83.6%) of farmers in Nakuru County had primary and secondary school education. Household heads with no formal education had low participation in cash crop production (50%) compared to food crop production (100%). Higher education levels among household heads were associated with higher involvement in cash crop production and even more so in food crop production. There is an indication that education has a positive impact on the production of either food or cash crops but those with no formal education seem to prefer food crops. This is because educated farmers have a higher likelihood of investing in cash crops compared to illiterate ones because educated farmers are better at managing risks associated with a shift from food to cash crop production (Cole *et al.,* 2014).

In regard to household food situation, 62.0% household heads with primary level of education who had cultivated cash crops were food secure, 81.4% of those who had attained secondary education and 86.7% of

those with post-secondary level of education were also food secure. In case of food crop production, while only 25.0% of those without formal education were food secure, a large proportion of those with primary (58.5%) and with secondary levels of education (78.3%) were food secure. These findings indicate that household food situation tended to improve with increase in the level of education of the household heads. Education is a socio-economic factor that has a direct link to household food security and the reason is that education enables people to diversify assets and activities, increase productivity and income and all these elements ensure food security in the long run (Olayemi, 2012). The level of education of the household head was significantly related to the food situation of households that had cash (0.021) and food crop (0.000) production. This implies that the level of education of the household head had a positive impact on cash and more so food crop production which in turn determined their household food situation. These findings confirm those of Kaloi *et al* (2005) who found that the education level of the household head was significantly and positively associated with food security in Mwingi district, Kenya. The implication of these findings is that education is important in agriculture because farmers with formal education are capable of utilizing skills and farm resources in a manner that will enable them to provide adequate food for their households.

Household sizes were divided into four categories as shown in Table 1. Most households had between 6 to 10 people (62.2%), 23% had between 1 - 5 people while the rest had over 11 people. The mean household size of 7.64 was higher than the Kisii Central sub-County average of 5 people and a national household average of 5.1 (Kisii Central District, 2009). These findings differ slightly from those of Nyangweso *et al.,* (2011) who found an average household size of 6.0 in Vihiga District, Kenya. Results indicate that 72.9% of the households with 1- 5 members were engaged in cash crop production while all the households (100%) in this household category were engaged in food crop production. As household sizes increased, food production was preferred by most households compared to cash crop production. This finding is supported by the fact that most of the land (>80%) allocated to cash and food crop production in the study area is devoted to the production of food crops (Kisii County, 2013).

Households which had engaged in cash crop production were associated with the following food situations: 80.0% of those with 1-5 members were food secure and the proportion declined to 71.2% for the 6 -10 household then to 70.0% for the 11-15 household size category and finally to 33.3% for those with over 15 members. Households with food crop production indicated that 70.8% of those with 1-5 members were food secure and the proportion of food secure households declined to 65.9% for those with 6-10 people and increased to 68.0% for household size of 11-15. Generally, household food security seems to deteriorate with increase in household size although the trend is not consistent. Household size is a significant factor in agriculture and food security as it influences availability of farm labour, total area cultivated, the amount of food retained for subsistence consumption and the marketed surplus (Aidoo *et al.,* 2013). Household size, however, was found to have no significant impact on food situations of households engaged in either cash (0.331) or food crop production (0.315). These findings somehow support those of Nyangweso *et al.,* (2007) who found that it is not household size *per se* but the number of adults in the household that is significantly associated with household food security. Other studies have found household size to have a significant but inverse association with household food security (Sekhampu, 2013; Kaloi *et al.,* 2005).

Distribution of farm sizes among the sample population was as follows: about 20% had less than 1 acre, majority (48%) had 1-2 acres and 31.6% had over 2 acres of land. The average farm size was 2.08 acres. These findings compare well with those of Jaetzold *et al.,* (2009) who found that the amount of arable land available for households in the study area ranges between 0.4 hectares (about 1 acre) and 0.8 hectares with an average of 0.5 hectares. A large proportion of households who owned less than 1 acre of land were involved in food production (97.6%) compared to cash crop production (52.3%). This implies that households with small farm sizes opt to grow food crops instead of cash crops and as the acreage increases so does the number of households engaged in both cash and food crop production. Households prefer to cultivate food crops first to provide food and they are likely to engage in cash crop production if they have access to larger farm sizes. This is supported Lukanu *et al.,* (2004) who found that farmers might be better of if they could produce only cash crops and use the earned income to purchase food, however, farming households perceive this to be a risky livelihood strategy.

About 59% households with less than 1 acre who engaged in cash crop production were food secure and the proportion increased to 70.4% for those with 1 - 2 acres and to high of 79.7% of those with larger farm sizes (> 2 acres). Households who cultivated food crops also appeared to improve their food situation with increase in farm size, for example, 46.3% of those with less than 1 acre were food secure and the proportions increased to 65.7% for those with 1 - 2 acres and finally to 80.3% for those with more than two acres. Clearly, household food situation improved with increase in farm size and more so for households engaged in food crop production. Farm size has been found to be closely linked to food security and this is because large farms enable households to expand areas devoted to food production and to diversify their agricultural activities which may lead to higher incomes and food security (Van Der Veen and Tagel, 2011). In this study, farm size was found to have a significant impact on food situation of households that were engaged in food crop production (0.001) but not

cash crop production (0.161). A study by Volege (2005) in Vihiga district, Kenya provides evidence that the amount of land owned by households is a direct indicator of household food security. However, the existing empirical evidence of the impacts of cash crops on food security is fairly mixed. A study in Nicaragua showed that upgrading of farmers activities through specific cash crops leads only to short term positive impact on food security (Carter *et al.,* 2012).

Most of the households (77%) earned less than Kshs 120,000 per annum, 15.8% earned between Kshs 120,000 and 240,000 and only 2.4% earned over Kshs 360,000 per annum (Table 1). The average income was Kshs 95,800 per year implying that on average, households earned about Kshs. 8,000 (about 88 US dollars) per month. This income was low given that in Kenya, the poor are defined as those who survive on 1 US dollar or less a day, therefore, for an average household size of 5 the poverty line is at Kshs 12,245 (177 US dollars) or less per month (Olielo, 2013). A lower proportion households with income of less than Kshs 20,000 were engaged in cash crop production (77.6%) compared to food crop production (100%). Generally, households with higher incomes were involved in both cash and food production with a slight variation between the two crops.

About 67% of the households who earned less than Kshs 120,000 per year and who were engaged in cash crop production were food secure and the food situation improved to 91.3% of the households who earned Kshs 120,000 - 240,000 per annum and finally to 100% of those earning over Kshs 240,000. Households who cultivated food crops performed as follows; 62.0% of those who earned less than Kshs 120,000, of the households were food secure and a large proportion of households (78.8%) with incomes ranging between Kshs 120,000 - 240,000 were also food secure. These results showed that higher income levels were associated with improved household food situation. This is because households with diversified sources of income or those with higher incomes are likely to be more food secure than those with low income because they have the means to purchase the required food and also the capability to withstand shocks in prices that cause food shortages (Loopstra *et al.,* 2013). Household income was found to have a significant impact on food situation of households engaged in cash (0.019) and food crops (0.019) production. These findings are supported by Arene and Anyaeji (2010) who found that a significant relationship exists between household income and household food security, and that the higher the income the greater the chances of households being food secure.

3.3 Household Food Situation

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 on issues of food insecurity 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 conclusion of the study is that the level of education of the household head and household income were the two socio-economic characteristics with significant impact on cash and food crop production which ultimately influenced household food situation in the study area. Farm size on the other hand was significantly associated with the food situation of households engaged in food crop production. In view of these findings, this study recommends that rural populations be encouraged to acquire formal education through increased school enrolment and participation in adult literacy programmes. Household income should be enhanced through increase in farm productivity, value addition at the farm level and establishment of cottage industries.

5.0 References

Achterbosch, T., Berkum, S. & Meijerink, G., (2014). Cash Crops and Food Security.Contribution to Income, Livelihood Risk and Agricultural Innovation. www.wageningenur.ni/.../a16b98bc-948d-41f0-8e58-6e1b8070297_201...

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.

Auma, J. O., Langat, J. K., & Ngigi, M. W., (2010). A Comparison of Male Female Household Headship and Agricultural Production in Marginal Areas of Rachuonyo and Homa Bay District, Kenya. *Jordan, Journal of Agricultural Sciences* 6(4).

Carter, M.R., Toledo, P., & Tjernstrom, E., (2012). Investing in Small-farm Productivity:Impact Dynamics and Heterogeneity in Nicaragua. Working paper.

Chipande, G.H., (1987). Innovative Adoption among Female-Headed Households: The Case of Malawi. *Development and Change*, 18:315 -327.

Cole, S., Gine, X., & Vickery, J. (2014). How does risk Management Influence Production Decisions? Evidence from a Field Experiment. Havard Business School Working Paper. 13-080. www.hbs.edu/.../13-080_138f3c30-b5c2-4997-bf5b-9821f89cbd3.pdf

Connely, W.T., & Chaiken, M. (2000). Intensive Farming, Agro-diversity, and Food Security under Conditions of Extreme Population in Western Kenya. *Human Ecology,* 28(1): 19-51

Doss C. R., (2001), Men's Crops? Women's Crops? The gender patterns of cropping in Ghana. Yale Center for International and Area Studies. Paper to be presented at the AAEA meetings August 2001, Chicago, Illinois

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

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

Gladwin, C., Thomson, A., Peterson, J., & Anderson, A. (2001). Addressing Food Security in Africa via Multiple Livelihood Strategies of Women Farmers. 26(177-207).

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.

Govereh J. & Jayne, T. S., (2003). Cash cropping and Food Productivity: Synergies or Trade-off? *Agriculture Economics,* 28,29-38

IFPRI, (2013). Global Policy Report. International Food Policy Research Institute. Washington DC.

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

IIbery, B.W., (1978). Agricultural Decision-Making: A Behavioural Perspective.www.phg.sagepub.com/content/2/3/448.full.pdf

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.

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

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

KNBS, (2007). Kenya Integrated Household Budget Survey-2005/06. Ministry of Planning and National Development.

Koopman, J. (1993). The Hidden Roots of the African Food Problem: Looking within the Rural Household. In Folbre, N., B. Bergman, B. Agarwal and M. Floro. Eds. *Women's Work in the World Economy,* 82-103. New York: New York University Press.

Kumar, S.K. (1987). Women's Role and Agricultural Technology. In Mellor, J.W., C.L. Delgado, and M.J. Blackie. Eds. *Accelerating food production in sub-Saharan Africa,* 135-47. Baltimore, MD: Johns Hopkins University Press.

Loopstra, R., & Tarasack, V., (2013). Severity of Household Food Insecurity is Sensitive to Change in Household Income and Employment Status among Low Income Families. *The Journal of Nutrition.* 2013; June 12.

Lukane, G., Maryann, G., Peter, G., & Steve, W., (2004). Farmers' Cash Crop Cultivation Decisions in Southern Niassa Province, Mozambique. *Development Southern Africa* 21(3): 531-554.

Mallick, D., & Rafi M., (2010). Are Female-Headed Households more Food Insecure? Evidence from Bangladesh. *World Development* 38 (4): 593-605.

Nyangweso, P.M., Odhaiambo M.O., Odunga P.O., Korir M.K. & Otieno, D.C. (2011). Disentangling Farmers' Preferences and Cost Allocation Among Inputs for Food Security in Vihiga District, Kenya.

Nyangweso, P.M., Odhaiambo, M.O., Odungari P., Korir, M.K., Kipsat, M.J. & Serem, A.K., (2007). Household Food Security in Vihiga District, Kenya: Determinants of Dietary Diversity. Proceedings of the 8th African Crop Science Society Conference, El-Minia University, Egypt. October 27-31:1383-1390.

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.

Omamo, S.W. (1998). Transport Costs and Small Cropping Choices: An Application to Siaya District, Kenya. *American Journal of Agricultural Economics,* 80(1), 116-123.

Omonona, B.T., & Agoi, G.A., (2007). An Analysis of Food Security Situation among Nigeria Urban Households: Evidence from Lagos State, Nigeria. *Journal of Central European Agriculture* 8 (3):397-406.

Ruel, M.T.& Levin, C.E. (2001). Assessing the Potential for Food-based Strategies to Reduce Vitamin A and Iron Deficiencies: A Review of Recent Evidence. Food Consumption and Nutrition Division Discussion Paper no 92. International Food Policy Research Institute, Washington DC, 2000.

Schneider, K., & Gugerty, M. K., (2010). The Impact of Export-Driven Cash Crops on Smallholder Households. EPAR Brief No. 94 Evans School of Public Affairs, University of Washington.

Sekhampu, J. J., (2013). Determinants of the Food Security Status of Households receiving Government grants in Kwakwatsi, South Africa Mediterranean. *Journal of Social Sciences,* 4(1).

Shroeder, C., Onyango, K'Oloo, T., Ranabhat, N.B., Jick N. A., Parziers H. K., & Gemenet, D. C., (2013). Potentials of Hybrid Maize Varieties for Small-holder Farmers in Kenya: A Review Based on SWOT Analysis. *African Journal of Food, Agriculture, Nutrition and Development.* 13(2):7562-7586

Uploff, N., (2012). Supporting Food Security in the 21st Century through Resource Conserving Increases in Agricultural Production. *Agriculture and Food Security* 1:18.

Van Der Veen, A., & Tagel, G., (2011). Effect of Policy Interventions on Food Security in Tigray, Northern Ethiopia. *Ecology and Society* 16(1):18
http://www.ecologyandsociety.or/vol16/iss1/art18/

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.

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

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.

Table 1: Socio-economic Characteristics of Households Engaged in Cash and Food Crop Production

Household characteristics	Frequency N=209	(%)	Households engaged in production of: Cash crop	Food crop
Gender				
Male	170	81.3	81.2	98.2
Female	39	18.7	61.5	100
Educational level				
No formal education	12	5.7	50	100
Primary	96	45.9	73.9	97.9
Secondary	83	39.7	84.3	100
Post-secondary	18	8.6	83.3	85
Household size				
1-5	48	23	72.9	100
6 - 10	130	62.2	80	99.2
11-15	27	12.9	74	92.5
>15	4	1.9	75	100
Farm size				
< 1 acre	42	20.1	52.3	97.6
1 - 2 acres	101	48.3	80.1	98
>2 acres	66	31.6	89.3	100
Household Income (Kshs '000)				
< 120	161	77	77.6	98.1
120 - 240	33	15.8	69.7	100
240 - 360	10	4.8	90	100
360 - 480	1	0.5	100	100
>480	4	1.9	100	100

Table 2: Results of the Impact of Socio-economic Characteristics on Cash and Food Crop Production and Household Food Situation

	Food Situation for Households Engaged in:					
	Cash Crop Production			Food Crop Production		
Household characteristics	Food secure (%)	Food Insecure (%)	Chi-square Results	Food secure (%)	Food Insecure (%)	Chi-square Results
Gender			**0.51**			**0.063**
Male	73.2	26.8		69.5	30.5	
Female	66.7	33.3		53.8	46.2	
Educational level			**0.021***			**0.000***
No formal education	50	50		25	75	
Primary	62	38		58.5	41.5	
Secondary	81.4	18.6		78.3	21.7	
Post-secondary	86.7	13.3		82.4	17.6	
Household size			**0.331**			**0.315**
1-5	80	20		70.8	29.2	
6 - 10	71.2	28.8		65.9	34.1	
11-15	70	30		68	32	
>15	33.3	66.7		25	75	
Farm size			**0.161**			**0.001***
< 1 acre	59.1	40.9		46.3	53.7	
1 - 2 acres	70.4	29.6		65.7	34.3	
>2 acres	79.7	72.2		80.3	19.7	
Household Income(Kshs '000)			**0.019***			**0.019***
< 120	67.2	32.8		62	38	
120-240	91.3	8.7		78.8	21.2	
240-360	100	0		100	0	
360-480	0	100		0	100	
>480	75	25		75	25	

*Significant at ≤ 0.05

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Academic conference: http://www.iiste.org/conference/upcoming-conferences-call-for-paper/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar