Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 14, Issue 1, 2014
PRINT ISSN 2284-7995, E-ISSN 2285-3952

CONTRIBUTION OF URBAN VEGETABLE PRODUCTION TO FARMERS' LIVELIHOOD: A CASE OF THE KUMASI METROPOLIS OF ASHANTI REGION OF GHANA

Solomon Kodjo DARKEY[1], B.M. DZOEMKU[1], E.L. OKORLEY[2], N.A. GYIMAH[2], F.A.BLUWEY[3]

[1]CSIR-Crops Research Institute, P. O. Box 3785, Kumasi, Ghana, West Africa,
Email: bmdzomeku@gmail.com
[2], University of Cape Coast, Department of Agricultural Economics and Extension, PMB, Ghana, EmaiL: leokorley@yahoo.com
[3]University of Education, Winneba, P. O. Box 25, Winneba, Ghana

Corresponding author: bmdzomeku@gmail.com

Abstract

The number of urban poor is rapidly increasing as urban population grows. Urban vegetable production is therefore a response to the available market demand and the challenges of unemployment and food insecurity resulting from the urbanisation. The study examined the contribution of urban vegetable production to farmers' livelihoods in the Kumasi Metropolis of Ashanti Region of Ghana. Descriptive survey design was used for the study. Based on a simple random sampling technique, 300 urban vegetable farmers were selected and interviewed. Cronbach alpha coefficient values showed high reliability and consistency of the farmers' livelihood subscales. The study that the contribution of urban vegetable production to farmers' livelihoods differed significantly regarding different livelihood subscales (ANOVA). Post-hoc multiple comparisons test (Dunnett's T3) result revealed that the contribution of urban vegetable production to farmers' mean livelihoods was generally 'low'. However, it contributed 'moderately high' to their natural and physical capitals. The strength of association between farmers' mean livelihood subscales also showed that urban vegetable production impacted differently and significantly on their livelihoods. It is recommended that Farmer Based Organisations (FBOs) should be formed to help empower and protect farmers' from the exploitation of prospective buyers. It would also help address common challenges confronting members including high input cost, lack of credit facilities and inadequate marketing avenues.

***Key words*:** *financial capital, human capital, information capital, livelihood assets, natural capital, physical capital, social capital, urban vegetable production*

INTRODUCTION

The number of people living in urban centres continues to grow at approximately twice the rate of rural areas. It is expected that urban population the world over will increase from 2.76 billion in 1995 to 5.34 billion in the year 2025 (UNFPA, 1996). In Sub-Saharan Africa, it is projected that by 2015, there would be 25 countries including Ghana with higher urban population than rural. It is further estimated that by 2030, this would increase to 41 countries (UNPD, 2004). Already, about 44 percent of the population in the West African sub-region is urban compared to only four percent in 1920. United Nation (1995) reported in 2000 that 38 percent of Africans lived in urban areas. This figure is expected to increase to about 55 percent by 2030.

Ghana has also witnessed increase in its urban population from 43.8 percent in 2000 to 50.9 percent in 2010 (Ghana Statistical Service, 2012). As a result, poverty is gradually concentrating in the urban areas (Baud, 2000). The United Nations Food and Agriculture Organization estimated that nearly 870 million people of the world's 7.1 billion population were suffering from chronic undernourishment in 2010-2012. Almost all the hungry people, 852 million, live in developing countries. There are 16 million people undernourished in developed countries (FAO, 2012). Urban authorities are therefore faced with challenges of creating adequate employment, providing basic services and other socially sustainable

strategies. Consequently, cities are fast becoming intervention and planning centres for strategies that aimed at eradicating hunger and poverty and improve livelihoods to enhance food security and nutrition for the urban poor and vulnerable households.

Urban agriculture is one such strategy that enhances food security, stimulates local economic development, and facilitates social inclusion and poverty alleviation (Hovorka and Keboneilwe, 2004). As a remedy to the urban poverty, an increasing number of city dwellers have resorted to all kinds of income generating activities in the urban informal sector. These include intensive irrigated agriculture; mostly vegetables for either all-year-round or dry season production (Cofie *et al.,* 2003). Irrigated urban agriculture contributes significantly to urban food supply especially leafy vegetables for low income households. Income from irrigated farming is about 2-3 times that of the traditional rain-fed agriculture (Danso *et al.,* 2002). The comparative advantages of urban over peri-urban agriculture are market proximity, needless of refrigeration and storage facilities for perishable crops and minimal transportation costs (Obuobie *et al.,* 2006). Urban agriculture in cities like Accra and Kumasi in Ghana for instance supply up to 90 percent of the most perishable vegetables (Drechsel *et al.,* 2006).

These vegetables serve as major and efficient sources of micronutrients considering both per unit of land occupied and per unit production cost compared to other crops (AVRDC, 1996). The importance of urban vegetable production to improve vitamin and micronutrient supply especially for the urban poor is recognized by international policy-makers (FAO, 1996). A minimum daily intake of 200 grams of vegetables is necessary to meet the micronutrient requirements of the human body. However, vegetable consumption in most developing countries is far below the recommended level (Gura, 1995).

Urban vegetable farming contributes substantially to the economy of Ghana in general and the Kumasi Metropolis in particular beyond the provision of livelihoods and food security. Though, extensive work has been done on urban vegetable production over the years in Ghana and Kumasi Metropolis in particular, the contribution of urban vegetable production to farmers' livelihoods has not been adequately examined. The study therefore seeks to fill in this information gap.

The objective of this study was to determine the contribution of urban vegetable production to farmers' livelihoods in the Kumasi Metropolis of Ashanti Region of Ghana.

MATERIALS AND METHODS

The study was carried out in Kumasi, the capital of the Ashanti region. It is between latitude 6.40^0 N and longitude 1.30^0- 1.35^0 W. The total land area of the region is about 24,389 Km^2 with a projected urban population **of** 1,889,934 by 2009 with an annual growth rate of 5.4 percent (KMA, 2006). The average minimum and maximum temperatures are 21.5^0C and 30.7^0C respectively. The region has bimodal rainfall regime stretching from April to July for the major season and from late August to November for the minor season. The mean annual rainfall is 214.3 mm and 165.2 mm for the major and minor seasons respectively.

The study focused on open-space vegetable growing areas in urban Kumasi. The population for the study consisted of all open-space vegetable farmers in the Kumasi Metropolis of Ashanti Region of Ghana. A simple random sampling technique was used to select a sample size of 300 vegetable farmers. A list of 408 farmers provided by the Ministry of Food and Agriculture (MoFA) helped in minimizing bias to ensure representativeness, reliability and generalisability of the results. Primary data for the study was generated through the use of interview schedule. The enumerators were trained by the researcher on the instrument administration.

Farmers' livelihoods were sub-scaled under natural, information, financial, human, social and physical capitals. The livelihood indicators were developed by asking farmers direct questions. These questions were similar to those developed by DFID (1999), Bosompim (2006) and Akaba (2008) in their measure of

livelihood. Likert-type scale was developed and used by the farmers to rate the livelihood subscale indicators. The reliability and internal consistency of the subscales were determined using Cronbach's alpha coefficient test. The test results of the livelihood subscales showed that the instrument was reliable and consistent according to Palant (2001) and Hueta and Lugo (1996). The data was analysed using Statistical Package for the Social Sciences (SPSS).

One-way analysis of variance was computed to determine whether statistically significant differences existed among the farmers' mean livelihood subscales as a result of their urban vegetable production. Levene's test was then used to determine the appropriate post-hoc multiple comparisons to be used to find where significant differences actually existed among the mean livelihood subscales. Dunnett's T3 was chosen as the appropriate post-hoc multiple comparisons test for the mean livelihood subscales. The strength of association between the farmers' mean livelihoods (Eta Squared) was also calculated to assess the importance of the significant differences by dividing the sums of square between groups by the total sums of square. The result was then interpreted using Cohen (1988) conversion guideline.

RESULTS AND DISCUSSIONS

Urban vegetable production is a major business venture in the major cities of Ghana. It contributes to the livelihoods of the urban poor.

Table 1.Analysis of Variance of Farmers' Mean Livelihood Assets

Livelihood capitals	Mean	SD	F- test	Sig.
Physical Capital	2.44	1.21	93.37	0.000
Natural Capital	2.07	1.23		
Social Capital	1.82	1.14		
Financial Capital	1.80	1.05		
Human Capital	1.35	1.06		
Information Capital	1.25	1.09		

n= 300 p<0.05 Scale: 3 = High (H); 2 = Moderately High (MH); 1= Low (L)
Source: Field Survey Data, 2010

The results showed significant differences among farmers' mean livelihood subscales at 0.05 alpha levels (Table 1). The study revealed that physical and natural capitals contributed moderately high to the livelihoods. However, social, financial human and information capitals contributed low to the livelihood assets (Table 1). This implies that urban vegetable production was responsible for the observed differences and not due to chance. This suggests that urban vegetable production contributed differently to farmers' mean livelihood subscales.

Table 2. Multiple Comparisons of Contribution of Urban Vegetable Production to Farmers' Livelihood Subscales

Livelihood Assets	Mean Difference		
A B	(A-B)	Std Error	Sig
NC IC	0.867*	0.067	0.000
NC FC	0.153	0.073	0.424
NC HC	0.207	0.073	0.068
NC SC	0.121	0.067	0.663
NC PC	- 0.488*	0.071	0.000
IC FC	- 0.715*	0.060	0.000
IC HC	- 0.660*	0.053	0.000
IC SC	- 0.746*	0.057	0.000
IC PC	-1.355*	0.066	0.000
FC HC	0.054	0.066	1.000
FC SC	- 0.031	0.059	1.000
FC PC	- 0.641*	0.064	0.000
HC SC	- 0.086	0.059	0.917
HC PC	- 0.695*	0.064	0.000
SC PC	- 0.609*	0.057	0.000
n = 300 * Mean difference is significant at p<0.05			

NC= Natural Capital; HC = Human Capital; SC = Social Capital; IF = Information Capital;
PC = Physical Capital; FC = Financial Capital

Results showed that the mean differences among farmers' natural ($\overline{X}$ =2.07; SD = 1.23), information ($\overline{X}$ = 1.25; SD = 1.09), financial ($\overline{X}$ = 1.80; SD= 1.15), human ($\overline{X}$ = 1.35; SD = 1.06), social ($\overline{X}$ = 1.82; SD = 1.14) and physical capitals ($\overline{X}$ = 2.44; SD = 1.21) were statistically significant with one another at predetermined alpha level of 0.05 (Table 2). This suggests that the significant differences among the mean livelihood subscales were as

a result of the farmers' urban vegetable production. The results also revealed that natural and physical capitals which were the most affected and recorded 'moderately high' mean livelihood subscales according to the scale of measurement, were significantly higher than information, financial, social and human capitals. The result is partly consistent with the findings of Bosompim (2006) that farmers are likely to invest profits accrued from their farms in the purchase of inputs and other equipment that will assist them maintain their farms than investing it in other aspects of their livelihoods. The findings of Akaba (2008) that urban vegetable contributed 'high' to farmers' natural capital and 'low' to their financial and human capitals are also consistent with this study result. On the contrary, his 'high' impact recorded on farmers' social capital and 'low' contribution to their physical capital are at variance with this research result.

Table 3.Strength of Association between Farmers' Mean Livelihood Subscales

Livelihoods subscales	Sum of Squares	df	Mean Square	F	Sig.
Between livelihood subscales	284.41	5	56.88	93.37	0.000
Within livelihood subscales	1092.87	1794	0.60		
Total	1377.28	1799			
Eta Squared	0.2				

The results also suggest that urban vegetable production contributed differently and significantly to farmers' livelihood subscales (Table 3). This is confirmed by the large (0.2) effect size value obtained according to Cohen (1988) convention guidelines.

Through vegetable production, farmers in the Kumasi metropolis can improve on their natural and physical capital assets more and significantly than information, financial, human and social capital assets. Multiple benefits can be generated from a single physical asset when land (natural capital) which is used for both direct productive activities may also be endowed with financial capital when used as collateral for loans. Therefore, integrated approach needs to be designed towards improving farmers' livelihoods collectively to enhance productivity and incomes for sustainable livelihood of farmers.

CONCLUSIONS

The level of contribution of urban vegetable production to the farmers' livelihood subscales in the Kumasi metropolis is generally 'low'. However, it impacted 'moderately high' on their natural and physical capitals according to the scale of measurement. Urban vegetable production contributes differently and significantly to farmers' means livelihood subscales. In conclusion, the formation of FBOs would also enhance farmers' access to information (information capital), build mutual trust among farmers and lower the cost of working together. It will further improve the effective management of common resources (social capital) and effective and efficient use of tools and equipment (physical capital) to increase farmers' productivity for more income (financial capital).

REFERENCES

[1]Akaba, S., 2008, .Household food security and perceived improvement in livelihood benefits of vegetable producers in the Ketu District of the Volta Region of Ghana.
[2]AVRDC, 1996, Combating micronutrient deficiency through vegetables. Asian Vegetable Research and Development Center, Shanhua, Tainan, R.O.C. AVRDC Centerpoint, Vol.14 (1): 4-5.
[3]Baud, I.S.A., 2000, Copping with globalization. The need for research concerning the local response to globalization in developing countries. Den Haag, RAWOO.
[4]Bosompim, M., 2006, Cocoa farmers' perceived Impart of the cocoa high technology programme on their livelihoods in the Eastern Region of Ghana.
[5]Cofie, O.O, van Veenhuizen, R., Drechsel, P., 2003, Contribution of urban and peri-urban agriculture to food security in Sub-Saharan Africa. Paper presented at the Africa Day of the 3rd WWF in Kyoto, 17-3-2003.

[6]Cohen, J., 1988, Statistical Power Analysis for the Behavioural Sciences Hillsdale.NJ: Erlbaum.
[7]Danso, G., Drechsel, P., Wiafe-Antwi, T., Gyiele, L., 2002, Comparison of farm income and tradeoffs of major urban, peri-urban and rural farming systems around Kumasi, Ghana. Urban Agriculture Magazine 7: 5-6.
[8]DFID, 1999, .Sustainable livelihoods guidance sheets. Retrieved March 30, 2010 from http://www.livelihoods.org
[9]Drechsel, P. Graefe, S., Sonou, M., Cofie, O.O., 2006, Informal Irrigation in Urban West Africa: An Overview. IWMI Research Report 102.
[10]FAO, 1996, Food for consumers-marketing, processing and distribution. Food and Agricultural Organization of the United Nations, Rome.
[11]Food and Agriculture Organization, 2012, "The State of Food Insecurity in the World 2012" http://www.fao.org/docrep/016/i3027e/i3027e00.htm
[12]Ghana Statistical Service (GSS), 2012, 2010 Population and Housing Census, summary report of final results. Accra, Ghana: Ghana Statistical Service. A publication of the Ghana Statistical Service. Accra
[13]Gura, S., 1995, egetable production - a challenge for urban and rural development. Entwicklung und Lndlicher Raum 4:3-6.
[14]Hovorka, A., Keboneilwe, D., 2004, 'Launching a policy initiative in Botswana', Urban Agriculture Magazine 13, Trees and Cities – Growing Together:p.46
[15]Huerta, J.M., Lugo, D., 1996, FCL Program Impact on Extension Volunteers and Leaders in Puerto Rico. Impact Evaluation of Family Community Leadership Conference San Juan, Puerto Rico: pp. 1-11
[16]Kumasi Metropolitan Assembly, 2006, Retrieved September, 29, 2010 from: http://kma.ghanadistricts.gov.gh/
[17]Obuobie, E., Keraita, B., Danso, G., Amoah, P., Cofie, O.O., Raschid-Sally, L., Drechsel, P., 2006, Irrigate urban vegetable production in Ghana:Characteristics, benefits and risks. IWMI-RUAF-IDRC-CPWF, Accra,Ghana: IWMI, 150 pp.p.46
[18]Pallant, J., 2001, SPSS Survival Manual: A Step-by Step Guide to Data Analysis Using [19] SPSS for Windows (version 10). Crow's Nest, New South Wales: Allen &Unwin, Autralia. Project R7 132, Report OD 144, HR Willingford, Willingford, UK, 54pp.
[20]UNFPA, 1996, The state of the world population. United Nations, Geneva.
[21]United Nations, 1995, World urbanization prospects: the 1994 revision. New York.
[22]United Nations Population Division, 2004, World Urbanization Prospects: The 2003 revision. Department of Economics and Social Affairs. New York, USA: United Nations