Production and Marketing Challenges of Vegetable Farming: A case study of Kumasi Metropolis of Ashanti Region, Ghana

[1]S.K. Darkey*, [2]E.L. Okorley, [2]N.A. Gyimah, [3]F.A. Bluwey and [1]B.M. Dzomeku
[1]CSIR - Crops Research Institute, P. O. Box 3785, Kumasi, Ghana, West Africa.
[2]Department of Agricultural Economics and Extension, PMB,
University of Cape Coast, Ghana.
[3]University of Education, Winneba, P. O. Box 25, Winneba, Ghana

*Corresponding author: solodark599@yahoo.com

Received: 16th February 2016 Accepted: 14th April 2016

Abstract
The availability of large markets in urban communities has given cities enormous potential for food production especially vegetables. This potential partly accounts for mass exodus of people into cities. Poverty is however accompanying urbanisation but food production potential of cities could reduce urban poverty. This study assesses the production and marketing challenges of urban vegetable production in the Kumasi Metropolis of the Ashanti Region, Ghana. A simple random sampling technique was used to select a sample of 300 urban vegetable farmers from the study area. A structured interview schedule was used to collect data for analysis. Vegetable producers were basically smallholder farmers with land sizes between 0.1 and 3.2 ha. The result also revealed that greater proportion of cultivated land was put to leafy vegetables (lettuce, cabbage and spring onions). Again, majority (97.3 percent) of the respondents disposed of their produce through middle men at the farm gate level. The Kendall's coefficient of concordance analysis also showed that there was 51.8 percent agreement among respondents on the ranking of vegetable production challenges they encountered at 5 percent significant level. On the contrary, only 40.8 percent among the respondents agreed on the ranking of the marketing challenges they were confronted with. Agricultural extension training and education on innovative agricultural practices would increase farmers' income and enhance their livelihood. This study seeks to identify the production and marketing constraints urban vegetable farmers face in the Kumasi Metropolis of Ashanti Region, Ghana.

Keywords: Urbanisation, urban vegetable farmers, urban poverty, production, respondents

Résumé
La disponibilité des grands marchés dans les communautés urbaines est un facteur qui a fait des villes d'avoir un énorme potentiel de production alimentaire en particulier les légumes. Ce potentiel explique en partie l'exode massif de personnes dans les villes. La pauvreté, cependant accompagne l'urbanisation, mais la production alimentaire dans les villes pourraient réduire la pauvreté urbaine. Cette étude évalue les défis de la production et commercialisation végétale urbaine dans la métropole de Kumasi, de la région d'Ashanti, au

Ghana. Une technique d'échantillonnage aléatoire simple a été utilisée pour sélectionner un échantillon de 300 producteurs de légumes urbains de la zone d'étude. Un entretien structuré a été utilisé pour recueillir des données pour l'analyse. Les producteurs de légumes ont été essentiellement les paysans avec des tailles de terres entre 0,1 et 3,2 ha. Le résultat a également révélé qu'une plus grande proportion de terres cultivées a été mise à légumes à feuilles (laitue, le chou et les ciboules). Encore, la majorité (97,3 pour cent) des répondants disposés de leurs produits par le biais d'intermédiaires au niveau de la ferme. Le coefficient de Kendall de l'analyse de concordance a également montré qu'il y avait 51,8 pour cent accord chez les répondants sur le classement des défis de production de légumes qu'ils ont rencontré à 5 pour cent niveau significatif. Au contraire, seulement 40,8 pour cent chez les répondants étaient d'accord sur le classement des défis de marketing auxquels ils étaient confrontés. La formation de vulgarisation agricole et de l'éducation sur les pratiques agricoles novatrices pourraient augmenter les revenus des agriculteurs et à améliorer leurs moyens de subsistance. Cette étude vise à identifier les contraintes de production et de commercialisation que des maraîchers urbains font face dans la métropole de Kumasi, de la région d'Áshanti, au Ghana.

Mots-clés: Urbanisation, agriculteurs potagers urbains, la pauvreté urbaine, la production, les répondants

Introduction

Urban populations continue to rise globally as a result of massive exodus of the youth in particular from rural areas to urban centres. There appears to be a corresponding increase in urban poverty, food insecurity and malnutrition as a result of the rural - urban migration. Urbanisation of poverty occurs everywhere, but is deeper and more widespread in developing countries. It is a fact that a frightening percentage of these city dwellers live in abject poverty. For instance 34 percent of the urban population in Latin America lives under the poverty line. In Africa, the situation is even worse as 43 percent of the urban population lives in poverty (UN-Habitat, 2008). In 2001, 14 percent of the world's total population dwells in slums of Latin America and the Caribbean, 20 percent in Africa and 60 percent in Asia (Mougeot, 2005). People without resources and social networks are most vulnerable to food insecurity. Food has become increasingly difficult to access for the urban poor, especially in the bigger cities (Mougeot, 2005).

At least 20 million West Africans currently live in urban households with some kind of urban agriculture (Drechsel *et al.,* 2006). Ghana's urban population has also increased considerably from 32, 43.8 and then to 50.9 percent in 1984, 2000 and 2010 respectively (Ghana Statistical Service, 2012). Ashanti Region has the second highest proportion of urban population of 60.6 percent after Greater Accra Region. Poverty is accompanying migration and the urbanisation process. If poverty continues to consistently accompany the urbanisation process, then the urban share of poverty will reach 40 percent in 2020 at a time when the urban share of the population is projected to reach 52 percent. Ghana is known as one of the countries harbouring a large number of the poor in the world today (World Bank Report, 2010). One of every three persons in Ghana cannot afford the basic necessities of life. Thirty percent of its people are poor and mostly found in rural areas (World Bank Report, 2010). This has led to the migration of rural folks to the urban centers in search of jobs to make a better

living. Cities, like rural areas have the potential in food production.

Urban farming is constrained by land and labour as such typical farm sizes range between 0.05ha 0.2ha. Even with plot sizes that are significantly smaller than in rural areas, urban farmers earn at least as much as rural farmers. Monthly net income from mixed vegetable production ranges between US$10 and US$ 300 per farmer depending on farm size (Danso *et al.,* 2003). Vegetable farmers identified inadequate water for irrigation especially during the dry season as their major challenge. High input cost, fluctuating demand, pests and diseases also remain their production challenges (Oboubi *et al.,* 2006). According to Cornish *et al,* (2001), poor price information and lack of cold transport and storage facilities were identified as common bottlenecks of traditional market structures

Vegetables are a rich source of essential micronutrients (especially, vitamins, iron, and calcium) and generally have high fibre content. Production and supply of vegetables influence their consumption (Ali, 2000). A daily intake of 400 grams or 146 kg per year of vegetables is recommended by WHO and FAO. However, vegetable consumption in Sub-Saharan African countries is far lower compared to Asian and Latin American countries (Ruel *et al.,* 2004). The importance of urban vegetable production to vitamins and micronutrients supply especially for the urban poor can therefore not be over emphasized.

Objectives of the Study

The main objective of this study was to identify the production and marketing challenges in vegetable farming within the Kumasi Metropolis of Ashanti Region, Ghana

Materials and Methods

The study was conducted in the Kumasi Metropolis, the capital of Ashanti Region of Ghana in July 2010. The region is about 270 km north of the national capital; Accra. Kumasi is between latitude 6.350- 6.400 N and longitude 1.300- 1.350 W with an elevation between 250-300 meters above sea level. The metropolitan area constitutes 254 square kilometers (Kumasi Metropolitan Authority, 2006). The region lies within the forest zone of Ghana with sub-equatorial type of climate. About 21.5^0C and 30.7^0C constitute average minimum and maximum temperatures respectively. The rainfall pattern of the area is bimodal from March to July and from September to November for major and minor seasons respectively. The major soil type is ochrosol and Subin, Wewe, Susan, Aboabo, Oda, Owabi, Suntreso, Acheampomene, Akrudu and Asuoyeboa constituting the major rivers and streams. The total land area of the Region is about 24,389 square kilometers. The population of Kumasi Metropolis is estimated as 2,069,350 (Ghana Statistical Services, 2013). The dominant staple food crops grown include cassava, plantain and maize on upland sites often accompanied by dry - season vegetable farming especially along streams.

This study focused on the challenges of open-space vegetable production and marketing in urban Kumasi. The study population constituted all open-space vegetable farmers. Major vegetable growing areas in the metropolis were covered including: Asokore Mampong, Kwame Nkrumah University of Science and Technology (KNUST) Hall 6, D-Line Weweso, Boadi, Ayeduasi New Site, Gyenyasi, Georgia Hotel area, Manhyia, Kwadaso, Poku Sika and KNUST Police Station area. A list of 408 farmers provided by Ministry of Food and Agriculture (MoFA) assisted in the selection of a sample size of 300. A simple random sampling procedure was employed. Interview schedule was used to elicit information to generate primary data for the study. The data was analysed using Statistical Package for the Social Sciences

(SPSS version 16). Vegetable production and marketing challenges were ranked according to their severity. The rankings were determined using Kendall's coefficient of concordance (W) at 5 percent significant level.

Results and Discussion

Sex Distribution of Respondents

Results of the study showed that urban vegetable farmers in the Metropolis were predominantly males (94.0 percent) (Table 1). This result tallies with the findings by IWMI (2006). Female respondents on the contrary, constituted only 6.0 percent. The insignificant number of female respondents is in agreement with the results of Wibers (2003). The significantly high number of males (94.0 percent) as compared with that of females (6.0 percent) might be due to the daunting nature of the vegetable production processes such as vegetable beds construction, nursery care, watering, nursery beds stirring and application of pesticides) making the industry unfavourable for females to venture.

Table 1: Sex of Vegetable Producers in the Kumasi Metropolis

Gender	*Frequency*	*Percent*
Male	282	94.0
Female	18	6.0
Total	300	100

Table 2: Age Distribution of Vegetable Producers in the Kumasi Metropolis

Age Range (in years)	*Frequency*	*Percent*
15 - 21	19	6.3
22 - 28	50	16.8
29 - 35	74	24.6
36 - 42	70	23.2
43 - 49	42	13.9
50 - 56	28	9.3
57 - 63	10	3.3
64 and above	7	2.6
Total	**300**	**100.0**

Age Distribution of Respondents

From the result, respondents between the ages of 15 - 49 years constituted 84.8 percent of the labour force of the vegetable industry in the study area (Table 2). This distribution confirms the general opinion that vegetable production is tedious, capital and labour intensive and must be ventured into by people of much energy and strength such as those in the age group identified by this study. The youthful nature of the age structure of the respondents suggests that they are energetic and physically strong. It also implies that this age structure would be quick to adopt and disseminate new technologies and innovations than the ageing and the aged who constituted only 15.2 percent of the respondents. The mean age of 37 further confirms the age structure of the respondents. Their modal age was 30 with a standard deviation of (11.4). This shows considerable age variations among the respondents. Though, the studies of Ojo *et al.* (2010) and Lewu and Assefa (2009) indicated varied age group among urban vegetable farmers, nevertheless, the majority of them falls within the age category of labour force. The results further revealed that the number of farmers decreased as they advanced in age with only 2.6 percent of the farmers aged over 63 years. This further buttresses the earlier assertion that labour intensive and laborious nature of the vegetable production processes do not work in favour of the aged.

Educational Status of the Respondents

The results revealed that most of the farmers had formal education up to the primary (35 percent) and Junior High School (JHS) (30 percent) levels (Fig. 1). Farmers who had education up to the Senior High School (SHS) level constituted only 7.0 percent of the total respondents. Respondents who had tertiary

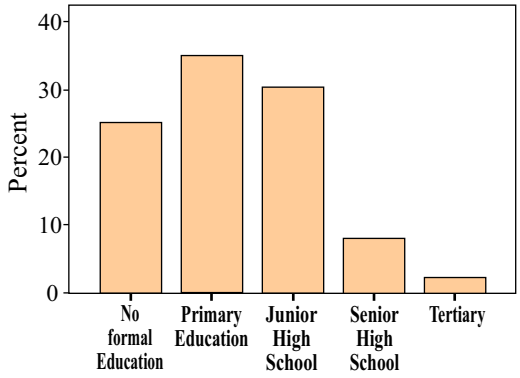

Fig 1: Educational Level of Vegetable Producers in the Kumasi Metropolis

levels education constituted only 2.0 percent. The proportion of respondents who possessed SHS or higher qualification (7.0 percent) was equally lower than the value reported in the Ghana Living Standard Survey's figure (13.6 percent) (Ghana Statistical Service, 2008). This implies that school enrollment figure has dropped perhaps due to unaffordability. Respondents without formal education also formed 26.0 percent of the total farmers. Generally, the literacy level of the respondents suggests that innovations would be easily understood, adopted and diffused among vegetable farmers. Educated farmers are expected to be more receptive to improve farming techniques and practices and therefore have higher level of efficiency than the less educated (Obwona, 2000). The low number (2.0 percent) of farmers with tertiary education might be that the individuals of higher academic qualifications have other options than seeking for employment or they might perceive farming as an occupation for the less educated. This result agrees with the findings of Ojo *et al.* (2010) who indicated that the majority of farmers are not educated beyond primary school level.

Land Holding for Vegetable Production

Urban vegetable farming is land and labour constrained and producers are mainly smallholder farmers with 0.1ha and 3.2 ha representing maximum and minimum land holdings respectively. Most of the respondents (49.7 percent) had land holdings of 0.2 ha and below. Respondents of land holdings between 0.2 ha and 0.4 ha constituted 29.7 percent. Approximately 21.0 percent had land sizes above 0.4 ha. (Table 3) The minimum land holding is consistent with the report of Tallaka (2005). However, their findings on maximum land holdings are lower than the result of this study. Farmers produced more leafy vegetables (lettuce, cabbage and spring onions) on total land area of 39.7 ha, 28.8 ha and 27.6 ha respectively (Table 4). This is consistent with the findings of IMWI (2006) that, farmers were into the production of mainly leafy vegetables. The biggest land area recorded under lettuce production also agrees with that of Drechsel *et al,* (2006) and Cornish and Lawrence (2001). The seasonal average production value of approximately GHC 9,200.00/ha reported by Abaidoo *et al.* (2009) is higher than all the seasonal average production values recorded by this study except for carrots and kenaf and garden eggs. The lowest value was recorded under okra perhaps because its market demand was very low as against supply.

Marketing of Farm Produce by Respondents

Marketing is a persistent problem in urban vegetable production mainly because the marketing of vegetables is done by middlemen. Again, most of these vegetables are perishable. The findings revealed that the majority (97.3 percent) of respondents marketed their produce through middlemen (Table 5). In Table 6, approximately ninety eight percent of farmers dispose of their produce at farm gate level. This agrees with the results of Obuobi *et al.* (2006). The sale of vegetables at farm gate level suggests that farmers were more vulnerable to the dictates and manipulation of these middlemen though

Table 3: Land Holding for Vegetable Production

Land Size	*Frequency*	*Percent*
= 0.2	149	49.7
0.2 - 0.4	89	29.7
>0.4	62	20.6
Total	300	100

Table 4: Vegetable Production in the Kumasi Metropolis

Vegetable crops	*Total land area for individual crops (ha)*	*Average production output value /ha/yr (GHC)*
Lettuce	39.7	7, 394.96
Cabbage	28.8	3,142.36
Spring onions	27.6	9, 088.04
Pepper	4.6	8,750.00
Jute mallow	4.1	4, 098.54
Cucumber	2.9	1, 175.86
Tomato	1.8	5, 347.22
Spinach greens	1.4	8, 752.86
Cauliflower	0.7	4, 527.14
Garden eggs	0.7	9, 285.71
Okra	0.6	300.00
Carrot	0.6	16, 350.00
Kenaf	0.5	11, 650.00
French beans	0.4	2, 150.00

produce pricing was the prerogative of the majority (64.7 percent) of farmers themselves (Table 7).

Vegetable Production and Marketing Challenges

The results revealed that there was 51.8 percent agreement among the respondents on the ranking of vegetable production challenges encountered (Table 8). The coefficient of concordance (W) was significant at 5 percent. Whilst high input cost and lack of credit facilities were ranked as 'very severe', incidence of pests and diseases was ranked 'severe' among the production challenges. Inadequate water was ranked 'moderately severe'. Poor soil fertility and irrigation of crops were also ranked 'slightly severe' among the production challenges. This suggests the significance of the vegetable production challenges to the respondents apart from poor fertility status and irrigation of crops. These results partly agree with the findings of Oboubie et al (2006). Whilst results of this study revealed inadequate water and lack of credit facilities as 'moderately severe' and 'very severe' respectively, Oboubie *et al.* (2006) however, reported that it was 'very severe' and 'moderately severe'. It was also observed that approximately 41 percent of the respondents agreed on the ranking of vegetable marketing challenges (Table 9). This implies that respondents were different in opinion regarding their ranking of the marketing challenges. This result partly agree with that of Cornish *et al.* (2001); Drechsel and Kunze (1999) who indicated that fluctuating demand and lack of cold transport and storage

Table 5: Marketing Channels of Vegetable Produced in Kumasi Metropolis

Channels	*Frequency*	*Percentage*
Middlemen	292	97.3
Middlemen & Retailers	3	1.7
Retailers	5	1.0
Total	300	100

Table 6: Sale Points of Vegetable Produced in the Kumasi Metropolis

Mechanism	*Frequency*	*Percent*
Farm gate	293	97.6
Urban market	5	1.7
Local market	2	0.7
Total	300	100

Table 7: Pricing of Vegetable in the Kumasi Metropolis

Produce pricing	*Frequency*	*Percent*
Self (farmer)	194	64.7
Negotiated	96	32.0
Market providers	10	3.3
Total	300	100

Table 8: Ranking of Production Challenges Among Urban Vegetable Producers

Production challenges	*Mean ranking*	*Rank*
High input cost	2.09	1
Lack of credit facilities	2.2	2
Incidence of pests and diseases	2.91	3
Inadequate water	3.93	4
Poor soil fertility	4.65	5
Irrigation of crops	5.16	6

n = 300; W = 0.518; df = 5, significance at 0.05 percent; Scale: 1 = Extremely severe; 2 = Very severe; 3 = Severe; 4 = Moderately severe; 5 = Slightly severe; 6 = Not severe

Table 9: Ranking of Marketing Challenges Among Urban Vegetable Producers

Marketing challenges	*Mean ranking*	*Rank*
Fluctuacting demand	1.64	1
Low price offer	2.62	2
Postharvest losses	2.95	2
Female dominance	3.74	3
Lack of cold transport and storage facilities	4.05	4

n = 300; W = 0.408; df = 4, significance at 0.5 percent; Scale: 1= Very Severe; 2 = Severe; 3 = Moderately Severe; 4 = Slightly Severe; 5 = Not Severe

facilities were the most important marketing challenges confronting vegetable producers in the Kumasi metropolis. Though, the result of the study found fluctuating demand to be the most important marketing challenges, lack of cold transport and storage facilities were least important.

Conclusion

Urban vegetable producers were found to be smallholder farmers vulnerable to exploitation by middle men. Agricultural Extension Agents should therefore encourage these farmers to form Farmer Based Organisations (FBOs). These organisations will address some of their production and marketing challenges. Agricultural extension education should also be intensified to improve on the adoption diffusion process of innovations in modern commercial vegetable production. This would essentially improve output and marketing in commercial vegetables production. Inevitably, these would upscale production, increase income, improve livelihoods and reduce malnutrition in the Metropolis.

References

Abaidoo, R. C., Keraita, B., Amoah, P., Drechsel, P., Bakang, J., Kranjac- bersavlje-Vic, G. 2009. Safe-guarding Public Health Concerns Livelihoods and Productivity in Wastewater Irrigated Urban and Periurban Vegetable Farming.

Cornish, G. A., Aidoo, J. B. & Ayamba, I. 2001. Informal irrigation in the peri-Urban zone of Kumasi, Ghana. Analysis of Farmer activity and productivity, DFID's Water KAR Project R7132. Report OD/TN 103, February 2001. Wallingford, UK: HR Wallingford. pp39

Danso, G. Drechsel, P.; Akinbolu, S. & Gyiele, L. 2003. Review of Studies and Literature on the Profitability and Sustainability of Urban and Peri-urban Agriculture. Final Report (PR 25314) submitted to FAO, IWMI, Accra

Drechsel, P. & Kunze, D. 1999. Synopsis from International Workshop on Urban

and Peri-urban Agriculture: Closing the Nutrient Cycle for Urban Food Security and Environmental Protection, Accra August 1999. Retrieved June 28, 2010 from http://www.CityFarmer.org

Drechsel, P., Graefe, S Sonou, M. & Cofie, O. O. 2006. Informal Irrigation in Urban West Africa: An Overview. IWMI Research Report 102.

Ghana Statistical Service) (GSS) 2014. 2010. Population and Housing Census. District Analytical Report. Kumasi Metropolitan.

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.

Ghana Statistical Service (GSS) 2008. Ghana Living Standards Survey Report of the Fifth Round, September, 2008.

International Water Management Institute (IWMI) 2006. Irrigated Urban Vegetable Production in Ghana. Characteristics, Benefits and Risks.IWMI-RUAF-CPWF.

Kumasi Metropolitan Assembly 2006. Accessed September 29, 2010 from: http://www. Kma. Ghanadistricts.gov.gh/

Lewu, F. B. & Assefa, Y. 2009. Farmers Knowledge in the cropping systems of northern KwaZulu- Natal South Africa. Current challenges and solutions for Sustainable future food production. African Journal of Agricultural Research 4 (11):148-153.

Mougeot, L.J.A., ed. 2005. AGROPOLIS. The social, political and environmental Dimensions of urban agriculture. London, Earthscan

Obuobie, E., Keraita, B., Danso, G., Amoah, P., Cofie, O. O., Raschid-Sally, L. & P. Drechsel. 2006. Irrigated urban vegetable production in Ghana:

Obwona, M. B. 2000. Determinants of Technical Efficiency Differentials Among Small and Medium Scale Farmers in Uganda: A case of Tobacco Growers. Final Report, AERC Workshop, Kenya

Ojo, O. D., Connaughton, M., Kintomo, A. A., Olajide-Taiwo, L.O. & Afaloyan, S. O. 2010. Assessment of irrigation Systems for dry season vegetable Production in urban and peri-urban zones of Ibadan and Lagos South-western Nigeria.

Smit, J, Ratta, A & Nasr, J. 1996. Urban Agriculture: Food, Jobs and Sustainable Cities, UNDP Habitat II Series, vol.1 UNDP, New York.

Ruel, M. T, Minot, N. & Smith, L. 2004 Patterns and determinants of fruit and vegetable consumption in sub-Saharan Africa: a multi-country Comparison. Report of the Joint WHO/FAO Work-Shop on Fruit and Vegetables for Health. Kobe Japan, 2004. Available from www. Who.Int/dietphysicalactivity/Fruit/En/index1.html. Accessed January 10th 2010.

Tallaki, K. 2005. The pest control systems in the market gardens of Lome, Togo. In: Mougout, L. (ed.). AGROPOLIS. The social, political and environmental Dimensions of urban agriculture. IDRC, Ottawa, Earthcan, London, p. 51-67.

UN-HABITAT 2008. State of the World's Cities 2008/2009: Harmonious Cities, (Earthscan: London).

Wilbers, J. 2003. Urban Agriculture and Gender: Some key issues.Discussions paper 1RUAF, ETC. 15pp.