

*Full Length Research Paper*

# Gender analysis of land use for urban agriculture and sustainability of livelihoods in Freetown, Sierra Leone

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Accepted 17 January, 2012

**This paper examined the gender analysis of land use for urban agriculture and sustainability of Livelihoods in Freetown, Sierra Leone. This is predicated on the fact that despite the stated contribution of urban agriculture (UA) to household food security, employment generation and poverty reduction, it has not received due recognition and policy support. The study was carried out in Freetown, Sierra Leone using a cluster sampling approach. From a list of 20 clusters, 6 were randomly selected and 10% of members in each cluster selected randomly ( $n_{\text{male}} = 30$ ;  $n_{\text{female}} = 61$ ;  $n = 91$ ) were interviewed. A survey research design was adopted in this study and the respondents for the study were stratified in terms of gender and UA enterprises. The majority of producers were female with the gross margin on male and female managed farms were 15130 and 23895 Leones per farm/ season respectively. Also, female managed farm had a higher return than male managed farms. Significant determinants of contribution of the UA income to household income are household size ( $t = -5.13$ ), access to credit ( $t = 4.09$ ), membership of farmers' association ( $t = 4.23$ ), gender ( $t = -2.40$ ), age ( $t = 1.78$ ) and farm size ( $t = -4.97$ ). As household size and the number of male producers increases, income from UA decreases.**

**Key words:** Gender, urban agriculture, livelihoods, land use.

## INTRODUCTION

Cities in sub-Saharan Africa (SSA) are growing fast, with annual 3.7%, the current urban growth rate is almost double the worldwide average and by 2030, half of Africa's population will be urban, (UN, 2008). This rapid urbanization has implications in the areas of social, economic, environmental protection, and the supply of adequate shelter, food, water and sanitation (UNFPA, 2007). The mass migration to cities in West Africa is sex selective with the male household members moving first, later followed by the female household members. International migration to Greater Freetown Area (GFA) is high and, dominated by males (a sex ratio of 130.3) as at 2004. GFA has the highest number (that is, 391,737 out of 1,047,413) and proportion (about 37.4%) of emigrants in Sierra Leone (Sesay et al., 2006). Nevertheless, it was

found that rural- urban migration in the country was very low for GFA (about 5.1) compared to the national average of 21.6. Migration from GFA to the rest of the country or elsewhere was observed to be far above (about 52.8) the national average of 21.6. This translates to a declining net migration (- 47.7) for GFA in 2004 despite overall increase in all the rates since 1985 (Sesay et al., 2006). Yet, GFA continues to be the primary city in Sierra Leone hosting 15.3% of the total population in 124 urban places in 2004 (Sesay et al., 2006). The current population of GFA is about 15.5% of the national figure of 4,976,871 in 2004 (Sesay et al., 2006). Urbanization has led to mass unemployment, poverty and inadequate food supply not only in the rural areas but also within and near the cities.

Most rural migrants have used farming within and near towns and cities, also referred to as Urban Agriculture (UA), as both a coping strategy and a way of life to meet their livelihood goals. The practice of growing food crops,

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especially horticultural crops, and tending small livestock (poultry, goats, sheep) in pockets of urban spaces and around the peripheries of cities in West Africa has, in recent years, emerged as a critical element in household food security. It provides income and economic livelihoods for producers and their households. It also offers opportunities for productive employment (Mougeot, 2005). Kekana (2006) maintains that urban agriculture is an informal set of activities focusing on farm production in an urban setting. The South African Council for Scientific and Industrial Research defines urban agriculture as any form and scale of agricultural activity within the boundaries of urban environment. It includes horticulture, floriculture, forestry, aquaculture and livestock production (Reuther and Dewar, 2005). Mougeot (2005) describes urban agriculture as an 'industry located within (intra-urban) or on the fringe (peri-urban) of a town, city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re-) using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area. Drechsel and Dongus (2010) reported that urban agriculture can have many different expressions, varying from backyard gardening to poultry and livestock farming, as well as crop production on larger open spaces in cities of sub-Saharan Africa. In this paper, UA is defined as the production of crops and livestock within and around Freetown city.

Urban agriculture has, for centuries, served as a vital input in the livelihood strategies of urban households in the developing countries. As a response to the economic crises exacerbated by the structural adjustment programs and increasing migration, urban agriculture has expanded rapidly within the last few decades (Bryld, 2003). Even so, urban agriculture is a vital element in the survival strategy of the household members who can generate extra income through the utilization of the potentials of urban cultivation (Zeeuw et al., 2000).

Urban gardens have evolved rapidly with the increased rate of urbanization. The result is that urban agriculture as a practice is observed in almost every city of Sub-Saharan Africa. Farming in urban environments has been found to benefit poor households through direct savings on food purchases, income generation through the sale of produce, and provision of a varied range of nutritious products. The greatest proportion of urban agriculture is undertaken as a survival strategy by individual households, generally in backyards to augment household real income (Landon-Lane, 2004; Kekana, 2006; Reuther and Dewar, 2005).

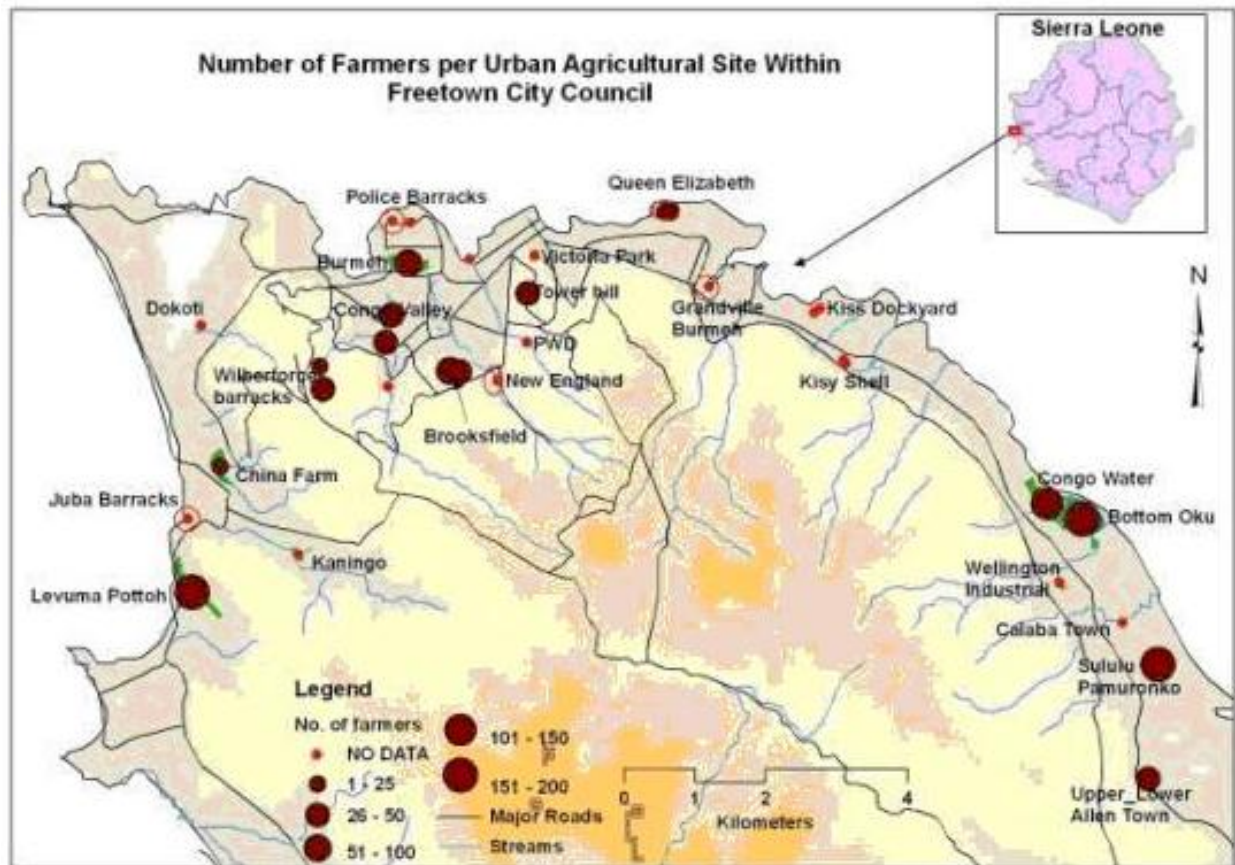
Urban agriculture has, for a significant period of time, been recognized as a key facet of urban survival in Zambia and normally forms part of multi-livelihood strategies. This has been through contribution to food security and poverty alleviation in developing countries. It

can also help to improve public health and resource management by reusing excreta, wastewater and organic solid waste (Hampwaye, et al., 2007; Belevi and Baumgartner, 2003). Over 70% of the residents of Windhoek, and Oshakati in Namibia practiced urban and peri-urban agriculture producing more than twenty three types of vegetables and fruit trees are grown on tiny plots, which are consumed by the household and contribute to improvement of their nutritional status. Existing marketing outlets are limited to the locality and hence not reliable. Animal production is limited to small stock and poultry, while fishing is seasonal activity. However, the absence of policy on urban and peri-urban agriculture is seen as a serious constraint towards its intensification and development (Dima et al., 2002).

In Sierra Leone, urban agriculture results from a complex interaction of economic, agronomic and social processes. It appears to have grown in significance as a local level response to the food and nutritional demands of a rapidly expanding and vulnerable urban population. Another important feature of urban agriculture as reported by several authors is the participation by female and male practitioners.

The recognition and integration of gender concerns into various national and international policies and programmes have increased over the years. Some studies investigated the gendered character of economies, labour systems, resource allocation and livelihoods, (Evers and Walters, 2000; Whitehead, 2002; Tsikata, 2009; Grown et al., 2000; Hansen and Vaa, 2004); and draw attention to the importance of situating analysis within the wider political economy and paying attention to historical processes, the role of institutions, intra-household labour and land relations, and of considering gender relations in terms of the distribution of work, the division of labour, access to and control of livelihood resources and decision-making. Understanding the socio economic situation and with it, gender issues and challenges is integral to sound policy analysis, and essential for effective development. Programmes and activities that take into account the reality of gender roles and relations have a higher likelihood of sustainability and effective poverty reduction impacts.

Feminist research shows how gender, in interaction with other socioeconomic differentiation theories on class and ethnicity, influences agrarian transition, health patterns, and economic development ((Preibisch, 2002; Lu, 2010). In recent years it has become increasingly clear that sustainable implementation of rural development projects is a function of socio-economic and gender context in which they operate. Gender analysis is important because productivity and efficiency are enhanced when interventions are targeted towards the actual users (Nyakudya et al., 2006). The general conceptions that women are always at disadvantage in terms of access to productive resources, extension services, marketing information and credit and that they



**Figure 1.** Map of Freetown showing study locations. Source: Resource Centers on Urban Agriculture and Food Security (RUAF) (2005): <http://www.ruaf.org/node/1133>.

are not capable of doing similar farming activities as men need to be tested on case by case basis. Gender analysis in urban agriculture is essential for policy formulation and programme planning to ensure equity in resource allocation and a balanced development that benefits both male and female urban dwellers (Danso et al., 2002). Kamara and Denkabe (1993) noted that gender differences exist between women heads-of-households and men heads-of-households. Female farmers in female headed households tend to limit their labour input in farm activities because of heavy commitment to reproductive roles such as nurturing and caring for children and attending to elderly members of the household. It turns out that in many cases, women use their land primarily for subsistence crops to feed their families, while men cultivates cash crops and keep the income.

Anecdotal evidences suggest that in Freetown, like in most other cities in the world, urban agriculture seems to be dominated by females. The reasons for this pattern of gender-based occupational participation in urban agriculture and livelihood outcomes associated with the persistence of the observed gender differences in participating in urban agriculture is not clearly explained

and understood. In the absence of this information, it has been difficult to recognize the importance of urban agriculture as a viable enterprise to be institutionalized and integrated into the urban planning, policy making, and programming agendas. The objective of the study is to explain gender differences in livelihood outcomes in urban agriculture in Freetown, as case study.

## MATERIALS AND METHODS

GFA is located in the Freetown Peninsular within the Western Area of Sierra Leone about 8° and 9° North of the Equator and 4° and 5° West of Greenwich Meridian (Figure 1). It is bounded on the West by the Atlantic Ocean and Adonkia Village, the North by the Sierra Leone River Estuary, the East by Allen Town and the South by Wilberforce and Hill Station. The total Land area of the present day administrative boundary of GFA is about 82 km<sup>2</sup>. That amounts to a percent of the total land area in the country (Sesay et al., 2006). Greater Freetown experiences tropical climatic conditions resulting in two distinct, namely wet and dry, but sub-divided regimes of seasons. That is early, middle and late wet and dry seasons (GOPA, 1995). The rainy season is normally from late April to early November. The rest of the year is the dry season. The temperature varies from 22° to 27°C almost throughout the year with the exception of occasional extreme lows at night and highs some days

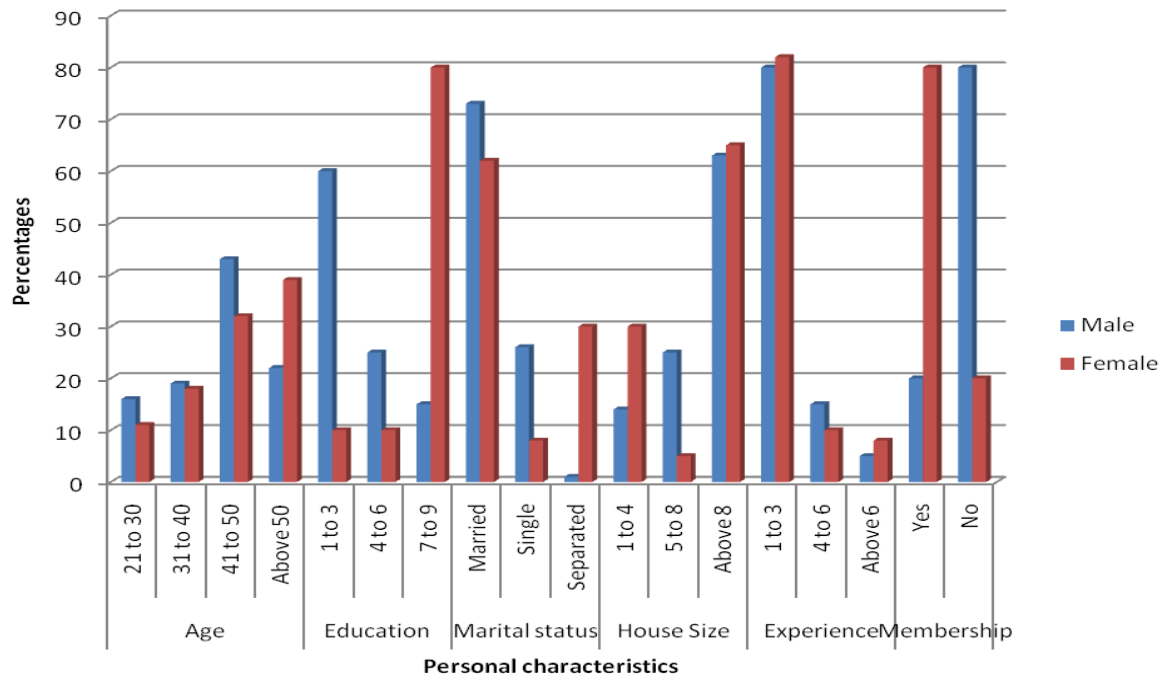


Figure 2. Personal characteristics of male and female urban agriculture farmers.

in the middle rainy and dry seasons, respectively. The relative humidity is high reaching 100% in the rainy season (GOPA, 1995). The highest average annual rainfall is about 800 mm occurring in August.

In order to carry out a gender analysis of UA enterprise and their livelihood, a cluster sampling approach was applied. From literature and preliminary surveys, vegetable production in urban areas that is market oriented is mostly carried out along perennial sources of water or lowlands. This constrains farmers to cluster around these sources of water. Therefore, cluster sampling is considered appropriate. For example, in Freetown, past studies (Winebah et al., 2006) and recognition survey shows that UA practice is in clusters in different part of Freetown.

From a list of 20 clusters (MAFS Western District), 6 were randomly selected and 10% of members in each cluster selected randomly ( $n_{male} = 30$ ;  $n_{female} = 61$ ;  $n = 91$ ) were interviewed as representative sample of each cluster. These are New England, Western Bormeh, Eastern Bormeh, Lumley, and Pandema road (PWD, Prisons) (Figure 1). Homestead land was not included because vegetable production on such lands is mostly for consumption only and not for sale. Besides, sampling this category of farmers may be difficult because they are scattered with very small land area for vegetable production.

A survey research design was adopted in this study and respondents for the study were stratified in terms of gender. This is to maximize variance as variables in the research questions were measured in the most quantifiable forms so that comparison can be made within each study location. All data were gender disaggregated such that activities in production were analyzed as male or female roles. The premise is based on the hunch that an UA enterprise that is owned or managed by men or women does not imply that all the activities associated with the enterprise are carried out by the owner or manager. The interwoven nature of gender roles and responsibilities on UA enterprises were ascertained. The data collected for this study (personal characteristics, livelihood activities, cost and revenue of vegetable production and number of food deficit days) were analyzed using

descriptive statistics, gross margin analysis and econometric tools. Descriptive statistics were employed to summarize the socio-economic characteristics of farm households, (which include age, educational levels, gender, family size and farm size. Gross margin and regression analysis were conducted using the Ordinary Least Square (OLS) estimation procedure to isolate the factors that affect the income made from urban agriculture because all assumptions for multiple regression were met. Factors hypothesized in this study were farmer’s age, years of schooling, household size, farm size, number of extension visit, access to credit, membership of farmer’s cooperative or social associations and accessibility to water.

## RESULTS

Gender disaggregated personal characteristics of vegetable producers in Freetown are presented. The gender distribution shows that 67% are female, while 33% are male. Winebah et al. (2006) reported that urban vegetable production is dominated by women in Freetown as men take up other jobs within the city. However, the proportion of male participation in vegetable production reported by Winebah (2005) was not as high as 33% reported in this study. This may be attributed to the increasing involvement of men in vegetable production due to its profitability relative to other income generating activities and the effect of urban vegetable production for meeting household food security. In Figure 2, majority of the male producers are between 41 to 50 years of age, while female producers were above 50 years, 63% for men and 56% for women. This age category represents the active labour force that is exploring urban agriculture as a livelihood option.

**Table 1.** Livelihood activities of producers.

Livelihood activities	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Vegetable farming along lowlands only	14	48	37	60
Vegetable farming along and above lowlands only	9	30	12	20
Artisan and Vegetable farming along lowlands only	3	10	6	10
Trading and Vegetable farming along lowlands only	4	12	6	10
Total	30	100	61	100

**Table 2.** Number of extension visits per year.

Number of visits	Male		Female	
	Frequency	Percentage	Frequency	Percentage
None	10	35	27	45
1	8	27	12	21
2	6	19	11	18
3	5	17	7	12
>4	1	2	2	3
Total	30	100	61	100

However, there are more women in the age categories that were above 40 years than men. It is also important to note that urban vegetable production has become an inter-generational income generating activity.

In terms of the years of formal education among vegetable producers in Freetown, 80% of women producers have 7 to 9 years of formal education, while 60% of men had completed 1-3 years of formal education (Figure 2). This implies that literacy level is low among producers. It is however a reflection of the general literacy rates of the populace in the study area. Winebah (2005) reported the same trend of literacy rates among urban vegetable producers in Freetown. Majority of the respondents are married, 73% and 62% are married for male and female vegetable farmers, respectively. While 23% of men are single, 30% of female producers are separated. This finding is similar to that of Winebah et al. (2006) on the report on gender and urban agriculture: a case study of three communities in Greater Freetown.

The prevalent category of household size among producers is those that have more than 8 persons per household. About 62% of the male managed farm households and 51% of female managed farm household belong to this category. This shows that large household sizes are preferred in the study area. Most of the respondents, 80% for male and 85% for female, have been engaged in urban agriculture for 1 to 3 years, a trend that could be associated with the growing importance and awareness of urban agriculture and the growing efforts of international organizations, such as International Water Management Institute, Cornell University and Action Aid on the subject. Drechsel and Dongus (2010) noted that spatio-temporal analysis of

urban agriculture in some West African cities shows that urban agriculture is not a short-lived or transitional phenomenon – probably as long as it can maintain its comparative market advantage. Membership of trade group is very prominent among female vegetable producers as many of them belong to groups. Eighty percent of female managed farms belonging to trade associations through which they collectively act as pressure groups for resources from nongovernmental organizations and government parastatals. Only 15% of the male producers belong to the trade association.

Table 1 shows that vegetable farming along lowlands only is the most prominent among producers, it is however higher among female (60%) than men (48%). There were more men (30%) in vegetable farming along and above lowlands than women (20%). Table 2 also reveal that vegetable farming along and above lowlands is also combine with artisan (10% each for male and female) and trading (12% for male and 10% female). Drechsel and Dongus (2010) indicated that open-space vegetable production in urban areas is dynamic, viable and largely a sustainable livelihood strategy, especially for poor urban dwellers.

Table 2 presents the number of extension visits received by vegetable producers. Although the number of extension visits was generally poor, the proportion of women (45%) not receiving extension contact is higher than men (35%), yet they are the most prominent producer. As the number of extension visits increased, the proportion of farmers reached decreased sharply. Nyakudya et al. (2006) reported that extension agents had been made to go through a refreshers training to be able to serve the need of urban farmers in Zimbabwe.

**Table 3.** Cost and revenue of UA producers per season (Leones)\*.

Parameter	Male managed farm			Female managed farm		
	Total cost	Total revenue	Net** income	Total cost	Total revenue	Net** income
Per farm	14970	30100	15130	25105	49000	23895
Per hectare	74850	150500	75650	125525	245000	119475

\*1USD = 3000Leones at time of study. \*\*No fixed cost or capital.

**Table 4.** Number of food deficit days among producers (per season).

Number of food deficit days	Male		Female	
	Number of farmers before UA	Number of farmers after UA	Number of farmers before UA	Number of farmers after UA
None	15	5	27	17
1	8	3	9	6
2	7	4	12	10
3	5	1	12	8

The cost and returns per farm and estimation for a hectare is given in Table 3. Female managed farm had higher return than male managed farms. This may be due to the fact that women had been involved in urban vegetable production than men. The results on the number of food deficit days among male and female vegetable producers in Table 4 shows that there is a major reduction in the number of food deficit days after they engage in UA activities. For the producers, the vegetables serve for immediate household income made from the sales. A particular trend however exists among the female producers in that the number of food deficit days is still high after their involvement in UA activities. This may be due to the fact that these women are very elderly and maintain large household sizes as widows. A review of revenues from mixed vegetable production in open-space urban agriculture showed that in many cases, monthly incomes range between US\$ 35 and 85 per farmer. These can go up to US\$ 160 or more when given larger space, extra labor and a more efficient water lifting device for irrigation (Drechsel and Dongus, 2010). In Dakar, Niang et al. (2006) showed that for lettuce only, revenues for farmers can reach US\$ 213-236 per month. If farmers have water access and produce throughout the year, they have a good chance to pass the poverty line of US\$ 1 per day, especially if other household members contribute their own incomes. Without water access, however, production might be limited to a few months, and other income sources are required in the dry season. Danso et al. (2002) found that urban farmers on irrigated land earn about two to three times the income from traditional rainfed agriculture in Ghana.

The impact of the contribution of UA income to household income was explored bearing in mind the

various factors identified from literature to be affecting it. In this study, income made from UA is regressed against farmer's age, years of schooling, household size, farm size, and access to extension services, access to credit, membership of farmer's cooperative or social associations and accessibility to water. Table 5 shows that all the independent variables have a positive relationship with the amount of income from UA except access to extension services. The multiple R shows that there is a strong correlation between the dependents and other variables of the study, while the R<sup>2</sup> shows that 48% of the variation in the dependent variable was explained by the independent variables. The F value = 5.41 and p = 0.026 indicate a significant relationship between the independent variables and contribution of UA income to household income. Significant determinants of contribution of the UA income to household income are household size (t = -5.13), access to credit (t = 4.09), membership of farmers' association (t = 4.23), gender (t = -2.40), age (t = 1.78) and farm size (t = -4.97).

## DISCUSSION

Urban agriculture is vital for the survival of the urban poor in most developing countries. It is a response to the still increasing urbanization and economic worsening of the situation of the poor as a consequence of structural adjustment programs and increasing migration. For many citizens, it is a paramount addition in the quest for improving urban food security. It has, thus, become a vital element in the household survival strategies in the urban areas in the developing countries, through the improvement of nutrition and economic base of the

**Table 5.** Determinants of income from UA.

Variable	Regression coefficient	Standard error	Coeff/S.E
Constant	570.25	21203.58	0.026
Age of farm manager	820.34	460.91	1.78
Years of schooling of farm manager	4143.40	2284.81	1.85
Gender	-6311.15	2620.48	-2.40
Household size	-1493.66	291.73	-5.13
Farm size	-27339.3	5500.96	-4.97
Access to extension	69.817	4518.61	0.01
Access to credit	29461.73	7192.65	4.09
Membership of farmer's association	23147.03	5465.58	4.23

F = 5.41, p < 0.05, R = 0.65, R<sup>2</sup> = 0.48.

household. In Freetown, there are more women than men in vegetable production. In terms of the years of formal education among vegetable producers in Freetown, women producers have 7 to 9 years of formal education, while 60% of men had completed 1-3 years of formal education. The prevalent category of household size among producers is those that have more than 8 persons per household. Although the number of extension visits was generally poor, the proportion of women not receiving extension contact is higher than men, yet they are the most prominent producers. Furthermore, female managed farms had higher returns than male managed farms and there is a major reduction in the number of food deficit days among male and female vegetable producers after they engage in UA activities. Significant determinants of contribution of UA income to household income are household size, access to credit, membership of farmers' association, gender, age and farm size. It is important that policy recommendations on urban agriculture should take into consideration these significant variables in order to ensure that the needs of producers are met.

The findings of the study show that urban agriculture enhances livelihoods sustainability and land use among practitioners in Freetown. Urban agriculture has been a response to increasing urbanization and the worsening economic situation of the poor especially in a post-war Sierra Leone and with an increasing migration to the city. The implications of urban agriculture practices are that programme and legislation can be introduced to institutionalize urban agriculture, reduce the contamination of wastes, modify agricultural practices, and educate cultivators. The practice of urban agriculture should be legalized and incorporated into city plans in order to enhance land security and reduce the fear of disruption which in turn motivate high yield cultivation and reducing food shortages in the city. Urban agriculture as an informal safety net strategy should not be overlooked or discouraged, but rather be supported by the national government. Also, support services, such as agricultural extension services and microfinance should be included

in the policy and directed to urban agriculture practitioners.

## ACKNOWLEDGEMENTS

This study was carried out within the frame of the Cities Farming for the Future (CFF) programme of the International Network of Resource Centres on Urban Agriculture and Food Security (RUAF Foundation). The authors acknowledge the financial support from DGIS and IDRC as well as the contribution of local partners to CFF implementation in Freetown.

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