



THE EFFECT OF GENDER ON THE FOOD SECURITY OF URBAN AGRICULTURE HOUSEHOLDS: A CASE OF ELDORET, KENYA

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ABSTRACT

In many developing countries, urban agriculture (UA), which involves the production, processing, and selling of food can be a common coping mechanism in urban communities for creating livelihood opportunities. This study was carried out among the low-income horticultural food crop producers and sellers. The respondents gender differences in their socio-economic characteristics, accessing and use of knowledge and skills required for proficiency in UA, motivating sources of information, coping strategies and their household food security were determined using both quantitative and qualitative research methods. Quantitative data was collected using both open and closed ended questions whereas qualitative data was sort through one-to-one interviews, case studies, observations, and focus groups. Quantitative data was analyzed using the SPSS software and reported in Tables and graphs. Qualitative data was triangulated in the discussions of quantitative data. The results revealed that female respondents more than males had lower socio-economic values which affected capital access and use to enable them to meet their household food security needs. Nevertheless, females, more than males had a stronger and more determined will to use coping mechanisms that enabled them to harness resources and avail food for their families although the diet was deficient in quantity and quality. There is need to empower women in UA livelihoods with necessary resources that will enable them to become better food providers in order for them to achieve better food security for their households.

Keywords: gender, food security, urban agriculture (UA).

INTRODUCTION

In every region of the world, landscapes are being transformed into food producing and marketing areas. Rural people are migrating to urban centres in search of economic and social opportunities while city dwellers are becoming more interested in producing their own food. According to the UN population prospects (median variant), the world population is expected to grow by 34% from 6.8 billion today to 9.1 billion in 2050 (WFP, 2009). Moreover, more than 70% of the world's population is expected to be urban by 2050. This urbanization will bring with it changes in lifestyles, consumption patterns and also the structure of market chains. The global demand for food is projected to be 70% higher than today, involving an additional annual consumption of nearly 1 billion tonnes of cereals for food and feed and 200 million tones of meat. Urban and peri-urban agriculture is fast contributing to the availability of food in cities and therefore helping to improve the diet of urban consumers. This is particularly important in terms of horticultural food crops that can be produced and marketed for home consumption.

Halving the worlds poor population with an income of less than one dollar a day as well as those who suffer from hunger is the millennium development goal one (MDG1) (Mougeot, 2005). This calls for urgent organization of cities especially in the developing world since it is noted that by 2015 - 2020 more than half of the world's population will be living in urban and peri-urban areas (Mougeot, 2005). Access to urban ready markets open up the possibility of cultivating horticultural food crops such as fruits and vegetables on a commercial basis and urban farmers aim to maximize their smallholdings using hired labour or their own.

Among the poor households, urban agriculture (UA) is a very important employee for the urban poor, and urban food security is a matter of concern, as urban poverty is reflected in their nutritional status (Lintelo *et al.*, 2001). The aim of the smallholder urban farmer is usually to feed the household, although the surplus harvest may be sold to neighbours or to those involved in selling. Farming, processing and selling of the food produced enables families to spend more on other basic requirements. The more able urban farmer who can invest in classical farming can be a good employer for the jobless urban poor. The informal food sector has a major stake in enabling families that have no access to open spaces for growing some vegetables and fruits for home consumption to be provided with a platform of buying from the farmers and selling to the rest of the population. The importance of UA in enhancing food security and solving socio-economic problems should be encouraged by urban planners and local authorities (Madaleno, 2001) for the purposes of enhancing livelihood opportunities.

Gender considerations in urban agriculture may enable researchers to recognize the differences in experiences as far as context specificity and the dynamics of urban agriculture systems are concerned (Hovorka, 2003) because urban women have a dual role to play in urban agriculture. They are seen cultivating, processing and marketing the food crops and therefore face far more socio-economic, legal and cultural constraints than men. UA in the hands of women is a powerful tool that can be used to uplift women's social position as well as to improve their livelihoods and the food security of their families (Ratta, 1993). It is important to understand what the role of each member of the household is as far as



production, marketing and the control of resources from UA is concerned. Gardeners have started adapting to more entrepreneurial strategies in order to secure access to external markets and aid, which is very boosting to the economy. However, women gardeners still remain disadvantaged compared to men due to the economic reforms that have failed to create a market free of gender biases (Friedberg, 1996).

In Kenya, rapid population growth and urbanization has taken effect in the midst of a negative economic growth, rampant unemployment and inflation. With fewer opportunities and lower remuneration for employment, Kenyans are increasingly turning to various livelihood ventures which include UA. In Eldoret municipality, activities in UA are seen to have increased rapidly as this has become a common livelihood opportunity and coping mechanism especially for women. Lack of capital, job insecurity, limited access to profitable markets, below minimum wages and lack of knowledge and skills are some of the problems faced by UA entrepreneurs.

Urban life can be combined creatively so as to be an effective arena for the socio-economic development for all the stakeholders. The food system of producers, suppliers, sellers, and consumers if kept within sustainable local gender relationships can enable a successful contribution towards sustainable socio-economic development and hence food security for a healthy working nation. The problem facing UA horticultural food crop producers and sellers is their lack of consistency and co-ordination of tasks due to their transitory nature. In this study, it was important to come to grips with the diverse manifestations of the gender differences in the production and selling of horticultural food crops and their extent to create sustainable livelihoods and food security of their households. The integrative gender characteristics were of major interest as they may impact on the livelihoods of the poor and hence the food security of their households. The question at stake was whether low-income households are able to thrive on the jobs or self employment in UA food micro farms and firms despite their low levels of performance to create sustainable livelihoods for both men and women and the subsequent effect on the food security of their households.

The study attempted to answer the following question

What effects do gender differences have on the performance of the livelihoods of the low income horticultural producers and sellers in urban agriculture?

The study was significant because it tackles an area in which a majority of the poor engage in livelihoods and therefore the real scenario of their interplay can be realized for use by interested stakeholders for the purposes of planning for sustainable practices and working towards achieving the millennium development goal 1 (MDG1), towards reducing the worlds poor population by half by 2020, and focusing on Kenya's vision 2030, whose aim is to be a globally competitive and prosperous nation with high quality life for all by 2030.

Theoretical framework

This study used the livelihood framework, which distinguished seven types of assets or capitals. These included financial capital (e.g. credit, cash); physical capital (e.g. transport, markets); human capital (e.g. labour, knowledge and skills); natural capital (e.g. land, water); political capital (e.g. policies and infrastructure) were examined in terms of access, information sources, and knowledge and skills. Social capital which refers to the networks of trust, exchange and mutual support (e.g. support groups, friends), and cultural capital (e.g. indigenous knowledge and values) which all individuals and households maintain to a greater or lesser degree and use motivating information sources and coping strategies to interact were also investigated. All these tangible and intangible assets were examined to see how their availability and access affects livelihoods and food security of households within the context of UA.

Applying the sustainable livelihoods approach highlights the multifaceted interactions between groups and the vulnerability context of households, their asset bases, intervening institutions, and livelihood strategies. Therefore culture, power and history were important aspects for integration to understand how urban agriculture impacts on livelihoods. Gender differences were hence focused on by including parts of the social relations framework (Kabeer, 1994) into the livelihood framework in order to bring out the differences in the urban agriculture characteristics, the resources that are accessed and used, and the effect on the food security of their households. Using the vulnerability framework, Moser (1998) tried to emphasize the importance of identifying what the poor have, rather than what they do not have, thus focusing on their assets. This may help to facilitate interventions, promote opportunities and remove obstacles so as to ensure that the urban poor use their assets more productively.

This study also used aspects of the social learning theory, where one sees a continuum between self and other and between internal and external sources of influence (Rotter, 1966). The social environment creates equality, respects diversity, draws upon individual experiences, facilities, shared responsibility, incorporates experimentation and innovation, accounts for emotional attachments to places and people within the group, and encourages social interaction (Carr, 1994). A context of urban agriculture that is multidisciplinary and interactive with some coordinated synergism may be able to flourish. Communities of interactive learning based on principles of experience, practice and native intellect are successful especially where local agricultural knowledge is created, socialized and exchanged (Kroma and Flora, 2001). A knowledge and skills model was used to determine the proficiency of urban agriculture entrepreneurs and to establish the adequacy of their knowledge and skills for the purposes of productivity, economic security and food security.



Urbanization and food security

The global number of hungry people keeps rising, and in sub-Saharan Africa, it is estimated to be one in three, totaling to 239 million (FAO, 2010). At the World Food Summit (WFS, 1996), the global community agreed to halve this number by the year 2015. The number of people living in urban centers continues to grow at approximately twice the rate of rural areas. It is expected that the global city population will increase from 2.76 billion in 1995 to 5.34 billion in the year 2025, thus exerting greater pressure on the natural environment than ever before (UNFPA, 1996).

Malnutrition has recently become an urban phenomenon and the urban poor carry the majority of the starving urbanites. The rapid growth of urban population has prompted concern about food security as far as availability and accessibility is concerned (FAO, 1995). Rapid urbanization in Sub-Saharan Africa has resulted in urban poverty, which is recorded to be severe enough to put livelihoods and food security at risk. Apart from this, urban growth has also brought forth other problems such as unemployment and environmental degradation.

In Kenya today, over 54 percent of the population live in poverty. More than 12 million of them live in "absolute poverty" surviving on less than one dollar per day. They do not have access to basic social services that the people in developed nations take for granted (Machinga, 2000). Comparatively, it is estimated that 15 percent of the rural population in Kenya are absolutely poor, and in the urban area, 49 percent live on less than one dollar everyday. The number of people living in urban centers continues to grow at approximately twice the rate of rural areas. It is expected that the city population will increase from 2.76 billion in 1995 to 5.34 billion in the year 2025, thus exerting greater pressure on the natural environment than ever before (UNFPA, 1996). Kenya has an estimated 4.3 million people in 26 districts, almost 10 percent of the entire population of the country who are in danger due to lack of food (GOK, 2012). In the same scenario, rapid urbanization has been developing in an environment of negative economic growth, rampant unemployment, and inflation.

Most of Africa's urban population spends 80 percent of their earning on food only, as compared to the US, who spend an insignificant 2 percent only (FAO, 2011). However, food per se is not everything a human being needs in life as other social amenities such as shelter, clothing, transport, education and healthcare are necessary for worthy living. Thus there is need for income generating opportunities especially for the vulnerable resource poor to earn an income from various micro-activities. Taken seriously, UA can help reduce poverty by providing employment and income for basic needs. The issue of food security has been recognized as a major problem in many parts of the world and therefore urban food production and selling are critical in providing food to feed the urban population.

Gender considerations in urban agriculture research

The recognition of people's vast experiences within UA should be segregated into its cultural categories of social status, sex and age, all considered within their context specificity. This is because gender analysis entails masculine and feminine responsibilities and roles, and social status (FAO, 1995). Therefore disaggregated data during gender analysis on UA may enable a researcher to explore why certain processes and structures generate different opportunities and challenges for different cultural categories of people. Hawking and vending of fruits and vegetables which was earlier a women's trade has been adopted by both gender, although the majority still remain to be women. It is also seriously taken as a source of livelihood and the importance of space in the urban context is very important when considering livelihoods because it is taken as important as land for agricultural production (Harrison and Mcvey, 1997) by gender. However, most women are seen operating from the grounds as men use sheds and wheelbarrows for more comfortable working postures and clientele-friendly conditions. Women are therefore more vulnerable to limitations that are brought about by the stress of using ergonomically unviable conditions. However, women are more organized members of society and they work with free and innovative minds. They can be successfully used as disseminating agents of information and skills if they are given key roles and access to productive factors (Ogen, 2004) such as land, credit, inputs, knowledge, etc, and allowed to voice their concerns. Even in the midst of their constrained triple day (household/childcare/livelihood), they can be good organizers and have a relentless pursuit towards fulfilling their roles.

Nevertheless, men and women are known to experience poverty differentially (FAO, 1999), which calls for the need for gender sensitive research. By desegregating data along gender lines, researchers can identify where differences or similarities occur within a particular contextual framework of men and women based on their unique experiences. Thus using gender as a theoretical, methodological and analytical tool can broaden the depth and width of urban agriculture experiences. This can help to deal with the problems that are specifically oriented to the specific context (e.g. UA) and target group (e.g. the poor) in order to get viable impact and measurable outputs.

Research evidence suggests that gender differences in contribution to on-farm, off-farm and non-farm activities are highly acknowledged by national governments, donors and NGO's but not fully tackled at policy-making levels. Policy makers need to identify the vulnerable groups at household, community, and national levels and initiate a plan of action based on providing equality in access to resources.

Livelihood systems are seen to embrace the arrangement of reproductive tasks and responsibilities, including domestic work and child-rearing, that accompany and make possible participation in paid work, social organization and public participation (Kanji and



Beall, 1999). Culturally, women and men have responsibility for different areas of household expenditure and the “willingness to pay” for unconcerned areas are normally not sustainable. Hawking and vending of fruits and vegetables which was earlier a women’s trade has been adopted by both gender although the majority still remain to be women and is seriously taken as a source of livelihood. The importance of space in the urban context is very important when considering livelihoods and is taken as important as land for agricultural production (Harrison and Mary, 1997). Decision making at household level is a reflection of the distribution of power at that level. A good example of men’s power over women is cited in Mushamba’s study (2004), in which it was noted that when men see greater financial benefits from a woman’s project, they want to take over its management and control of resources.

A gender perspective on livelihoods emphasizes the inseparable relationship between productive or income-generating activities and household work and consumption, including consumption of urban services. Efforts are further extended to intra-household, inter-generational; inter household and community level, not merely as a coping mechanism but ensuring that there is long-term security gain.

Study area

The study aimed at establishing the interface between HFPS in Eldoret Municipality which is in Kenya, and determining the efficiency of this livelihood strategy towards the food security of poor households who practice urban poor.

The research was conducted in Eldoret, which is situated in Uasin Gishu District, Kenya. Uasin Gishu District is one of the fastest growing districts of the Rift Valley province of Kenya. In this District, the poverty incidence is still high although it is a major food producer in the country. Those vulnerable to poverty include the poor urban food producers and sellers, particularly women and children (Uasin Gishu District Development Plan, 2002-2008).

Eldoret town is at an altitude of 2,085 meters and marks the boundaries between the lowest and the highest altitudes of the district, that is, 1,500 metres to 2,100 metres above sea level. Being in the highland plateau, it experiences high amounts of bimodal rainfall although the climate cycle has recently become unpredictable due to global warming. The main crops that are produced in the small farm sector include maize, beans, wheat, pyrethrum and horticulture (kales, cabbages, traditional vegetables, tomatoes, onions, carrots, etc).

METHODS

This study used an exploratory cross-sectional survey design. This helped to establish an insight on the phenomenon of study and derive some understanding of the constructs involved (Gall, Borg and Gall, 1996; Singleton *et al.*, 1993; Patton, 2003). It was both descriptive and analytical in nature. Both quantitative and

qualitative research was done to provide insights into lives of HFPS within the urban setting. This enabled the researcher to determine the perceptions, conceptions, opinions, and the social relations pertaining to their concepts, practices and life dynamics within the UA context.

The target population was the HFPS who practice UA. The population sample entailed those HFPS within Eldoret Municipality. The producers were those who worked on horticultural food farms whereas the sellers were those who buy their merchandise. Producer employees were chosen because they level up socio-economically with most sellers in the informal markets.

In this study, non-probability sampling was used. This is a type of sampling where the chances of members of the wider population being selected for the sample are unknown (Cohen, Manion and Morrison, 2000). In this case, this method was the most viable because of the transitory nature of UA activities. Therefore, availability of the targeted course and accessibility of the farm governed whether or not it was included in the study. This approach enabled the researcher to target information-rich cases for in-depth study. Both women and men were interviewed because of the interest that the researcher had in capturing gender issues.

The researcher came up with a total of 220 respondents, who included 110 producers and 110 sellers through random sampling. Case studies were chosen from among 2 of each willing sellers and producers with different characteristics, whereas two focus group discussions were carried out among 8 producers and 8 sellers of mixed gender. The data collected included the respondents’ gender differences in demographic information, socio-economic and UA characteristics, access and use of both human and non-human resources, and the food situation of their households. Quantitative data was collected using a questionnaire with both open and closed ended items. The researcher also used life stories (case studies), focus groups, and observations for qualitative purposes (Yin, 2003). A journal was kept for the day to day observations made. Photographs of the respondents were taken where consent was given to enable the researcher to explain the phenomenon better.

Data was analyzed through descriptive and inferential methods. Descriptive data was reported using frequencies and percentages in the form of Tables and graphs where appropriate. Inferential data was managed using Microsoft Excel and the Statistical Package of Social Science (SPSS 13.0) software. The Chi-square test of significance was used to get the statistical differences between the descriptive responses of the study groups (males and females). Where the Likert scale was used, the statistical significance of the differences between the study group means was determined using ANOVA. The results of the qualitative data from both observations and case studies were used to report the findings through triangulation with quantitative data as an attempt to secure in-depth understanding of the phenomenon in question (Denzin and Lincoln, 2000).



RESULTS

Characteristics of respondents

A developing country's input in agriculture is its greatest resource. The HFPS formed the population of this study, and it was crucial to identify all the characteristics of the respondents that interacted to influence their livelihoods and food security. The information presented in Table-1 shows how the respondents were distributed.

Based on a sample ($N = 200$) of respondents who practice UA, 50% ($n = 100$) were producers and 50% ($n = 100$) were sellers, with a total representation of 98 males and 102 females. More males (80%) than females (20%) were involved in producing horticultural food crops, whereas more females (82%) than males (18%) did the selling. This relationship between groups was significantly different ($\chi^2 = 76.911$, $p = .000$, $\alpha = .01$). This finding is consistent with others in Africa (Vide, 2004; Mubvami and Mushamba, 2004; and Nabulo, Nasinyama, and Oryem, 2004), where more men than women were involved in cultivating crops and marketing at wholesale, and women did more of subsistence cultivation and selling. From discussions, it was noted that women would rather perform the activities that would allow them flexibility in time management so as to tend to their other reproductive and productive roles. It also makes sense because women more than men would care to have daily earnings in order to bring basic needs home as the need arises and this is easily achieved from selling activities.

Open-ended communication is a tool that can successfully be used when dealing with the problems that the poor face because they are good team players and listeners too, and given an enabling environment, they can adapt to any workable advice that is given to them. Without communication, knowledge and action, most sellers may remain in their desperate conditions for a long period of time, which eventually becomes a "comfort zone" in the midst of poverty.

Gender relations in urban agriculture

The Chi-square test of significance revealed that there were significantly more male producers (81%) than females, and more female sellers (82%) than males ($\chi^2 = 76.911$, $p = .000$, $\alpha < .01$), (see Table-1). The respondent's

level of education was statistically non-significantly related by gender although more males (41%) than females (34%) had attained secondary level education. More males (60%) than females (56%) also had an average household size of 3-4 children. However, the number of children per household of respondents was non-significantly related by gender. The analysis also showed that there were significantly more males (56%) who were household heads than females (37%), ($\chi^2 = 42.169$, $p = .000$, $\alpha < .01$). More females (81%) than males (33%) were self employed ($\chi^2 = 46.473$, $p = .000$, $\alpha < .01$), and whether the respondents were married or single was statistically non-significant by gender. The reasons stated for coming to the urban area was statistically different between gender, whereby more males (70%) than females (38%) came to look for work, and more females (41%) than males (20%) came to join their spouses ($\chi^2 = 20.943$, $p = .000$, $\alpha < .01$). Likewise, significantly more females (71%) than males (51%) indicated that they did not have any training for practicing UA ($\chi^2 = 7.066$, $p = .029$, $\alpha < .05$), and more males (67%) than females (33%) did not pay rent for the premises they lived in and more females (44%) than males (05%) lived with their spouses who paid the rent. These differences were statistically significant ($\chi^2 = 38.699$, $p = .000$, $\alpha < .01$), (see Table-1).

These findings indicate several important points which were validated by the focus group discussions where it was deduced that more women settled for the seller status because they could get 'in and out' of it without many adverse effects such as loss of produce. Selling also requires less capital, can be transitory, is less rigorous and more flexible and can therefore incorporate women's reproductive activities with fewer conflicts to deal with. Contrary to conjecture, women's efficacy as sellers is in step with the self employment status which most of them undertook. Again this finding is consistent with the conclusion drawn by Mubvami and Mushamba (2004) where, men were found more on UA farms in producer positions due to employment demands. They were also found to be given managerial positions and paid better wages. Women, more than men are sellers because more often than not, they have less extra time to themselves and thus have to organize their daily tasks according to how well they can co-ordinate them.

**Table-1.** Characteristics of respondents by gender.

Characteristics of respondents	Males N = 98%	Female N = 102%	Chi-Square	Sig α
Respondents status in UA				
Producers	81	18	76.911	.000**
Sellers	19	82		
Respondents' age				
16-25	29	26	12.082	.002**
26-35	55	36		
36 and above	16	38		
Relationship to household				
Household head	56	37	42.169	.000**
Spouse	06	46		
Other	38	17		
Marital status				
Single	30	32	.178	.760 ns
Married	70	68		
Type of training done				
None	51	71	7.066	.029*
Relevant field	17	07		
Irrelevant field	32	23		
Main type of occupation				
Temporary employment	67	19	46.473	.000**
Self-employed	33	81		
Why did you come to Eldoret?				
Born in Eldoret	10	21	20.943	.000**
To look for work	70	38		
To join spouse	20	41		
Description of residence				
Slum area	45	46	0.657	.005*
Middle income estate	14	13		
High income estate	41	41		
Person paying rent				
No rent paid	67	33	38.699	.000**
Self	28	23		
Spouse	05	44		

**Significant at $\alpha < .01$, *Significant at $\alpha < .05$, ns = not significant.

Gender differences in ownership of livelihood means

The respondents' rural-land ownership and the size of land owned were statistically non-significant by gender. Significant differences were also found in the gender of those owning a selling shelter, whereby more males (62%) than females (33%) owned a selling shelter

($\chi^2 = 16.753$, $p = .000$, $\alpha < .01$). Significantly more women (75%) than men (30%) practiced urban agriculture under self-employment ($\chi^2 = 45.968$, $p = .000$, $\alpha < .01$) and more females (71%) than males (18%) also carried out the actual production or selling activities ($\chi^2 = 9.454$, $p = .002$, $\alpha < .01$), (See Table-1).



It was observed that more women than men were engaged in casual labour. Men got more permanent positions and the women who benefited the most were those whose spouses got the permanent positions since they had the pleasure and protection of working alongside their husbands. The amount of work time spent on UA

activities significantly differed by gender with more men than women spending most of their working time on UA activities. Women have multiple tasks and their time has to be divided so as to fit their daily routine into extended working hours.

Table-2. Ownership of livelihood means by gender.

Characteristics of respondents	Males N = 98%	Females N = 102%	Chi-Square	Sig α
Do you own rural land?				
Yes	52	49	.182	.674 ns
No	48	51		
Size of land owned				
No land	48	51	5.011	.171 ns
One eight to one quarter acre	31	19		
Half to three quarter acre	10	18		
More than one acre	11	12		
Do you own a selling shelter?				
Yes	62	33	16.753	.000**
No	38	67		
Status in UA				
Self employed	30	75	45.968	.000**
Employee	70	25		
Person doing actual UA				
Producer/seller	18	71	9.454	.002**
Producer/seller/employer	82	29		
Amount of work time spent				
Most of my working time	76	79	.104	.439 ns
Half of my working time	24	21		

**Significant at $\alpha < .01$, *Significant at $\alpha < .05$, ns = not significant.

Gender differences in livelihood characteristics

The ownership of the place of production or selling was statistically non-significantly different between genders. More males (50%) than females (23%) did their sales from the production site whereas more females (54%) than males (18%) sold their merchandise from a selling shelter. The differences were statistically significant ($\chi^2 = 35.724$, $p = .000$, $\alpha < .01$), (see Table-3). More females (85%) than males (61%) indicated that the purpose of the UA produce grown or sold was for both domestic use and sale. This relationship was statistically significant ($\chi^2 = 17.796$, $p = .000$, $\alpha < .01$). Whether the respondents achieved sufficiency for their households was statistically non-significant by gender, although more

females (54%) than males (46%) stated that they were able to sufficiently provide for their households from their UA practices. More males (58%) than females (49%) also indicated that they did not do any sales during scarcity and females (46%) more than males (24%) continued with their production or selling activities by getting merchandise from rural areas and the peri-urban. These relationships were statistically different ($\chi^2 = 17.041$, $p = .000$, $\alpha < .01$), (see Table-3). Whether the produce the respondents produced or sold was able to meet customers' needs was statistically non-significant by gender, with 58% females and 50% males indicating that their produce was never enough for their customers ($\chi^2 = 1.691$, $p = .429$, $\alpha > .05$).

**Table-3.** Livelihood characteristics of respondents by gender.

Characteristics of respondents	Males N = 98%	Females N = 102%	Chi-Square	Sig α
Mode of selling				
Site-selling	50	23	35.724	.000**
Hawking	12	18		
Selling shelter	18	54		
Deliveries	20	05		
Owner of land/space used for production/ selling				
Self	20	18	4.142	.126 ns
Employer	51	39		
Other (municipal)	29	43		
Purpose of HFC grown or sold				
Domestic use	07	27	17.796	.000**
Sale	08	12		
Both domestic and sale	85	61		
Sufficiency of production for household				
Yes	46	54	1.281	.322 ns
No	54	46		
Where is food for sale found during scarcity				
Buy from rural area	24	49	17.041	.000**
No sales done	58	31		
Municipal market	18	20		
Does produce meet customer needs				
Always	10	05	1.691	.429 ns
Sometimes	40	37		
Never	50	58		

**Significant at $\alpha < .01$, *Significant at $\alpha < .05$, ns = not significant.

Gender differences in income obtained and the satisfaction derived from UA

More males (45%) than females (37%) got above one dollar from UA daily, although this was statistically non-significantly different by gender ($\chi^2 = 2.888$, $p = .409$, $\alpha > .05$). However, the amount of money spent daily on food was significantly different by gender, with more females (61%) than males (37%) spending more than one dollar daily ($\chi^2 = 13.067$, $p = .001$, $\alpha < .01$). Females are known to use survival tactics such as borrowing, or credit purchases to ensure that there is at least some food for the

family to put in the stomach. More males (81%) than females (67%) indicated that the income received from UA was inadequate for their needs in a statistically significant relationship ($\chi^2 = 5.818$, $p = .023$, $\alpha < .01$), (see Table-4). More females (76%) than males (59%) agreed that accessing capital that is required for success in their UA activities would give them greater success (see Table-4). This is because of the continuity that was exhibited in the UA livelihoods by more females than males despite the constraints faced.

**Table-4.** Gender differences in income obtained and the satisfaction derived from UA.

Characteristics of respondents	Males N = 98%	Females N = 102%	Chi-Square	Sig α
Household income from UA				
More than one dollar	45	37	2.888	.409 ns
About one dollar	33	31		
Less than one dollar	22	32		
Daily food expenditure				
More than one dollar	37	61	13.067	.001**
About one dollar	17	14		
Less than one dollar	46	25		
Adequacy of income				
Not adequate	81	67	5.818	.023*
Adequate	19	33		
Performance of UA				
Very good	09	15	13.574	.001**
Satisfactory	31	42		
Poor	60	43		
Would capital access make you a better UA producer				
Strongly agree	18	10	4.825	.090 ns
Agree	60	75		
Disagree	22	15		

**Significant at $\alpha < .01$, *Significant at $\alpha < .05$, ns = not significant

In Ogen's (2004) study, in Cameroon, it was noted that women dominated in the diversification of activities, probably because men had higher expectations from their normal activities than women. And in Nabulo and Nasinyera and Orgen (2004) study of UA in Kampala, men were more involved in various forms of employment as the women performed UA. Atukunda (2003), on the other hand noted that more men carried out UA on a whole sale basis while women sold from their backyards. All these practices may impact on the contextual performance of UA and affect the output by gender. In this study however, women found their performance in UA significantly more satisfying than men ($\chi^2 = 13.574$, $P = .001$, $\alpha < .01$) (see Table-4).

Gender differences in accessing capital

The ANOVA test of differences between means was used to determine the differences in accessing capital between gender using values of 3 = always, 2 = sometimes and 1 = never. Higher means meant better access of capitals required for UA. Significant differences were shown in accessing physical, human, cultural, and political capital between genders. More males ($M = 1.97$ and $M =$

1.95) than females ($M = 1.77$ and $M = 1.83$) were able to access physical capital ($F = 17.136$, $p = .000$, $\alpha < .01$) and human capital ($F = 3.724$, $p = .045$, $\alpha < .01$) respectively, whereas more females ($M = 2.27$ and $M = 1.67$) than males ($M = 2.03$ and $M = 1.45$) accessed cultural capital ($F = 14.434$, $p = .000$, $\alpha < .01$) and political capital ($F = 10.033$, $p = .002$, $\alpha < .01$), (see Table-5)

The fact that physical capital was not easily accessed by more women than men confirms why their work place structures were much more temporary, unaesthetic and ergonomically unviable. This may affect physical performance and clientele appeal and thus end of day benefits. It was further noted that women's access to capital was based on informal approaches and arrangements, whereas men tried to "own" capital that was deemed to be more profitable for continuity of their livelihoods. In Nabulo's study (2004), cultural and social constraints affected productivity of more women than men, but in this study the reverse was applicable. Information that women obtained through accessing social and cultural capital enabled them to make informed choices and negotiate efficiently among their social contacts.

**Table-5.** Table of ANOVA showing gender differences in accessing capital.

Capital	Males mean	Females mean	F- value	Significant α
Financial capital	1.74	1.72	.132	.716 ns
Physical capital	1.97	1.77	17.136	.000**
Human capital	1.95	1.83	3.724	.045*
Social capital	1.50	1.55	1.910	.168 ns
Cultural capital	2.03	2.27	14.434	.000**
Political capital	1.45	1.69	10.033	.002**
Natural capital	1.65	1.58	1.774	.184 ns

**Significant at $\alpha < .01$, *Significant at $\alpha < .05$, ns = not significant.

Gender differences in the use of motivating sources of information

A Likert scale 1-3 (3 = always, 2 = sometimes, 1 = never) was used to identify the motivating sources of information between gender. Internal motivating sources of information were used by more males ($M = 2.43$) than females ($M = 2.27$) in a statistical significant difference ($F = 8.406$, $p = .004$, $\alpha < .01$), whereas the use of external

motivating factors was seen among more females ($M = 2.47$) than men ($M = 1.80$) in a significant difference ($F = 11.055$, $p = .001$, $\alpha = .01$), (see Table-6). Women are more socially oriented to their surroundings and are bound to listen wisely to the ideas and on goings of their external environment whereas men would want to depend on their own self initiatives more than external contacts.

Table-6. Table of ANOVA showing gender differences in the use of motivating sources of information.

Motivating information sources	Males mean	Females mean	F-value	Sig α
Internal motivating sources	2.43	2.27	8.406	.004**
External motivating sources	1.80	2.47	11.055	.001**

**Significant at $\alpha < .01$, ns = not significant

Gender differences in the use of entrepreneurship knowledge

The ANOVA test showed that significantly more females ($M = 1.79$) than males ($M = 1.47$) used entrepreneurship knowledge and skills ($F = 20.389$, $p = .000$, $\alpha < .01$) and more females ($M = 1.79$, $M = 1.89$, $M = 1.67$) than males ($M = 1.47$, $M = 1.49$, $M = 1.45$), also used efficient entrepreneurship, product information, and general consumer proficiency knowledge and skills

respectively, all significant at $\alpha < .01$, (see Table-7). Arguably, despite their low levels of education, women, more than men, appear to be keener with the knowledge that they pick along the way, which they use to improve their livelihoods and thus life situation. They are also fond of and good at reminding each other about positive aspects that may improve their situation in their endeavor to succeed together.

Table-7. Table of ANOVA showing gender differences in the use of entrepreneurship proficiency.

Entrepreneurship variables	Means		F-value	Sig α
	Males	Females		
General entrepreneurship	1.47	1.79	20.389	.000**
Efficient entrepreneurship	1.47	1.79	20.587	.000**
Product information	1.49	1.89	25.510	.000**
General consumer proficiency	1.45	1.67	10.087	.002**

Gender differences in food situation of urban agriculture households

Statements describing gender differences in the food eaten

The Chi square test of significance revealed statistical significant differences in responses between

genders in the statements describing the food eaten in the household (see Table-8). More males (32%) than females (10%), stated that they had enough but not always the kinds of food they wanted and more females (39%) than males (22%) indicated that their food was often not enough ($\chi^2 = 13.802$, $p = .003$, $\alpha < .01$). This brings in the question about food value and how it is perceived between



genders. Notably, women may care more about quantity and hence satiety, whereas men identify sufficiency with the quality of food.

Table-8. Statements describing sufficiency of food eaten between gender.

Food security questions	Males N = 98%	Females N = 102%	Chi-Square	Sig α
Description of food eaten by household				
Enough of food the we want to eat	5	6	13.802	.003**
Enough but not always the kinds we want	32	10		
Sometimes not enough	41	45		
Often not enough	22	39		

**Significant at $\alpha < .01$

Description of food situation in quantity and quality between genders in the last 12 months

The reasons given for why people do not have enough to eat were tested statistically between genders. More males (56%) than females (30%) indicated that lack of fuel may lead them not to have enough to eat ($\chi^2 = 6.420$ $p = .008$, $\alpha < .01$), (see Table-9). A majority of both males (71% and 84%) and females (73% and 88%) indicated that the reason for not having enough to eat may be due to unavailability and inaccessibility of food respectively. However, these relationships were non significant, indicating that both males and females

experienced quantity deficiencies in the same manner. The reasons for not having the quality of food needed revealed significant differences between genders in all the reasons stated except “not enough money for food”. More females (83%) than males (62%) stated that “not enough time for cooking was not a good reason for not having the quality of food needed ($\chi^2 = 11.277$, $p = .001$, $\alpha < .01$), (see Table-9). “Kinds of food needed not available” was a good reason for not having the quality of food needed for both gender, with 77% of males and 73% females although statistically non-significantly related.

Table-9. Gender differences in reasons why people don't always have enough to eat between gender.

Reasons for not having enough to eat	Males N = 100%		Females N = 100%		Chi-Square	Sig <i>α</i>
	Yes	No	Yes	No		
Reasons for not having the quantity of food needed						
Not enough money for food	52	48	64	36	2.801	.063 ns
Not enough time for cooking	52	48	44	56	1.257	.164 ns
No fuel available	56	44	30	70	6.420	.008**
Shops too far	31	69	10	90	13.525	.000**
Food not available	71	29	73	27	.031	.492 ns
Food available but not accessible	84	16	88	22	.864	.234 ns
Not able to cook because of poor health	26	74	7	93	12.931	.000**
Reasons for not having the quality of food needed						
Not enough money for food	93	7	90	10	.455	.338 ns
Kinds of food needed not available	77	23	73	27	.035	.451 ns
Not enough time for cooking	38	62	17	83	11.277	.001**
Shops too far	17	83	5	95	7.907	.004**
On a special diet	28	72	7	93	15.161	.000**

**Significant at $\alpha < .01$, *Significant at $\alpha < .05$, ns = not significant

Gender differences in household food situation

The ANOVA test of differences between means was done to test the gender differences in the household food situation based on scores of 0 = not true, 1 = almost every month, 2 = some months, not every, and 3 = only one or two months. A higher mean score meant that the

household was more food secure. Significant main effects between gender were obtained in some of the food situation items such as “worried food would run out” and “food bought didn't last” where significantly more females ($M = 1.97$) scored higher than males ($M = 1.87$), ($F = 7.435$, $p = .007$, $\alpha < .01$), (see Table-10). Females scored a



higher mean for “children were not eating enough” ($M = 1.93$, $F = 9.121$, $p = .003$, $\alpha < .01$). This shows that the food situation for females, more than males was better, although in some instances, statements such as “couldn’t afford balanced meals” and “couldn’t feed children a

balanced meal” had equal responses for both males and females and were statistically non-significant (see Table-10). Generally, both gender experienced shortfalls in balancing meals with the required food groups.

Table-10. Table of ANOVA showing differences in gender responses towards household food situation.

Statements of food situation	Males Mean	Females Mean	F Value	Sig α
Worried food would run out	1.84	1.97	7.435	.007**
Food bought didn’t last	1.87	1.97	7.435	.007**
Couldn’t afford balanced meals	1.96	1.96	.003	.954 ns
Had few kinds of low cost food for children	1.94	1.98	2.257	.135 ns
Couldn’t feed children balanced meal	1.94	1.94	.005	.943 ns
Children were not eating enough	1.79	1.93	12.975	.003**

**Significant at $\alpha < .01$, ns = not significant

The Chi square test of differences in gender towards the food situation revealed major statistical significant differences. More females (90%) than males (71%) stated that they ate less than they thought they should ($\chi^2 = 11.439$, $p = .001$, $\alpha < .01$), (see Table-11). More females (75%) than males (54%) also indicated that they did not eat for a whole day ($\chi^2 = 10.069$, $p = .000$, $\alpha < .01$), and more males (50%) than females (26%) indicated that children skipped meals frequently ($\chi^2 = 11.745$, $p = .000$, $\alpha < .01$). More females (86%) than males (65%) indicated that they cut the size of children’s meals ($\chi^2 =$

12.048, $p = .000$, $\alpha < .01$), (see Table-54), and more males (40%) than females (19%) indicated that children did not eat for a whole day ($\chi^2 = 10.877$, $p = .000$, $\alpha < .01$).

Arguably, women are more conscious about food sufficiency and they are able to detect when serving portions reduce. Sometimes they eat less or skip meals for a whole day in order to save their portions for either the children or their spouses. An unfortunate situation is that children under the care of men may easily skip meals or not eat for a whole day because men do not strive to cater for the hard times when food is inadequate or unavailable.

Table-11. Chi- square Table showing differences in gender responses towards respondents food situation.

Statement of food situation	Males %		Females %		Chi-Square	Sig α
	Yes	No	Yes	No		
Adults cut or skipped meals	71	29	94	08	14.549	.000**
Adults cut or skipped meals 3+ month	69	31	54	46	5.049	.018*
You ate less than you felt you should	71	29	90	10	11.439	.001**
You were hungry but didn’t eat	74	26	74	26	.000	.560 ns
You lost weight because not enough food	65	35	81	19	6.624	.008**
Adults did not eat for a whole day	54	46	75	25	10.069	.001**
Adults did not eat for a whole day 3+ months	12	88	22	78	3.676	.041*
You cut size of children’s meals	65	35	86	14	12.048	.000**
Children skipped meals frequently	50	50	26	74	11.745	.000**
Children skipped meals 3+ months	15	85	9	91	1.989	.116 ns
Children were ever hungry	60	40	65	35	.432	.305 ns
Children did not eat for a whole day	40	60	19	81	10.877	.001**

**Significant at $\alpha < .01$, *Significant at $\alpha < .05$, ns = not significant

The food security status of low income UA households

The food security status of the respondents’ households was determined using the 18 item food security test (USDA, 2000). The respondents were asked

to answer either affirmatively or negatively to each item. The number of affirmative responses was calculated using Microsoft Excel and the household food security level was thus determined using the RASCH computational



software. The scores were based on a scale factor of 5/7 (USDA, 2000). The results are as shown in Table-12. Only 5% of the respondents had a food security scale value of 5.1, which was the highest, with 9 affirmative responses. More males (36%), than females (23%) were food insecure with moderate hunger (scale value 4.7- 5.1), and more females (77%) than males (64%) were food insecure without hunger (scale value 3.4-4.3).

These results indicate that the food security status of women was better than that of men. From the foregoing, it was noted that women were more motivated by their external orientations which increased their ability to access social, political and cultural capital and gave them proficiency in enabling better food security for their households.

Table-12. Food security status of respondents' households.

Number of affirmative responses	All respondents N = 200%	Males N = 98%	Females N = 102%	Food security scale value	Food security status
9	5	5	4	5.1	Food insecure with moderate hunger
8	25	31	19	4.7	Food insecure with moderate hunger
7	35	37	34	4.3	Food insecure without hunger
6	28	22	33	3.9	Food insecure without hunger
5	7	5	10	3.4	Food insecure without hunger

(USDA, 2000). Food security scale.

DISCUSSIONS AND CONCLUSIONS

From the findings, one can deduce that women are at a more disadvantaged position in many aspects as they endeavor to fit in UA livelihoods, although they have a strong will and determination to succeed. Also, more women would rather be under the "protection" of a man even when household burdens such as feeding the family are left to them. Also, women were found to be more inquisitive, adventurous and socially oriented, with a readiness to listen, which put them in a better position to access and use the different types of capitals that were more readily available to them. However, men continue to access the more viable capitals and thus have better chances to succeed in their livelihoods.

Despite the fact that UA household sizes are generally low, the food situation is not encouraging as deficiencies in quality and quantity were cited. Women were found to have better food security status than men because they are able to practice continuity of livelihoods as well as diversification despite the constraints faced in their triple day (reproductive, productive and household roles). They are also more willing and cultured into practicing coping and motivational strategies between and among each other in order to buffer the food situation when times are hard. Most women in low income UA households would rather fend for their families by considering the quantity of food first, rather than quality, so as to satisfy immediate hunger.

Gender imbalances continue to breed socio-economic injustice and equitable access and control over productive resources is recommended. There is need for contextual policies and urban laws that address efficiency

for sustainability of UA livelihoods so that issues such as capital (knowledge and skills, credit, land and good infrastructure) are tackled as this may improve the food security of the vulnerable poor urban households. This may create an impetus for poverty reduction and thus food secure households with greater capacity to personal and national development.

Gender imbalances in UA are also known to affect co-operating livelihood groups because the success or failure of one livelihood, in this case producers (who were mainly men) and sellers (who were mainly women) affect the other. It is possible to nurture a win-win situation within contextually interactive livelihood groups and enhance livelihood performance, and thus each others food security. This should be done without exploiting either of the groups by denying them of the right to productive resources or degrading the urban ecology that they use. Capacity building institutions can enable such livelihood groups with knowledge on sustainable use of resources and general entrepreneurship. Such initiatives would be successfully carried out at the grassroots or community level using the participatory approach, which should initiate a gender balanced and sensitive approach in order to get maximum benefits for the welfare of the households of the interactive livelihood groups.

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