

**FOODS PRODUCED AND UTILIZED BY LACTATING MOTHERS' HOUSEHOLDS IN  
MWIKI, PERI\_URBAN OF NAIROBI****Dr. Nkirigacha-Miriti Evayline Muthoni\***Lecturer Pwani University School of Health and Human Sciences Department of Foods, Nutrition and Dietetics. P.O  
BOX 195, Kilifi.**Received on: 01/04/2020****Revised on: 22/04/2020****Accepted on: 12/05/2020****\*Corresponding Author****Dr. Nkirigacha-Miriti  
Evayline Muthoni**Lecturer Pwani University  
School of Health and Human  
Sciences Department of  
Foods, Nutrition and  
Dietetics. P.O BOX 195,  
Kilifi.**ABSTRACT**

Food production and utilization using urban agriculture goes a long way in fulfilling the human right to food and freedom from hunger. The aim of this study was to assess the foods produced and proportion consumed by lactating mothers of Nairobi. This cross sectional study was had 260 randomly selected lactating women living in Mwiki, Nairobi Kenya. A structured, validated and pre-tested questionnaire was used to obtain information on socioeconomic characteristics, food production and consumption. Data was entered into SPSS version 20 and analyzed using descriptive statistics and Pearson correlation coefficient was used to determine associations. Majority (61.6%) participated in urban agriculture. In crop production, maize (26.5%) home consumption, beans produced (28.4%) and home consumption was 18.4% and 10% was sold. Amaranth was produced at 25.7%, 8% consumed at home and 17.7% was sold other crops were grown in small quantities. 57.3% of the respondents owned land to practice urban agriculture. Majority of them (15.3%) had 250m<sup>2</sup> plots and 26.3% of these had inherited the land they had. Where the respondents did not own the land, they were renting (7.8%). More women (31.8%) than men (21.6%) decided on what crops to plant. More women (35.7%) provided labor for agriculture. More respondents consumed and also sold (34.1%) the produce compared to those who consumed only (27.8%). Vegetables were not a major food crop produced. Intervention programs should target on emphasizing the production and consumption of vegetable to increase availability and help meet the increased nutritional needs of the lactating.

**KEYWORDS:** Food produced: consumed: Lactating mothers: Households.**1: INTRODUCTION**

Increased food production and access are crucial to achieving major nutritional improvement. More foods should be produced that are rich in all the essential micronutrients, available in sufficient quantities and accessible to people all year round. Access to stable and sustainable food supplies is a precondition for the establishment of food security at the household level.<sup>[1]</sup> Greater and more sustained yields from the farming system, increases the potential access of the household to an adequate diet.<sup>[1]</sup>

Food insecurity in households of lactating mothers is known to lead to poor health, poor dietary intake and poor nutrition outcomes. This consequently leads to low rates of breastfeeding.<sup>[2,3]</sup> A study carried out in Bangladesh, observed that improved household's food security during the antenatal period resulted in poor infant feeding practices from 3 to 6 months, including providing cow's milk, juices and other drinks.<sup>[4]</sup>

Food insecurity sometimes make lactating mothers leave their infants at home to go and look for temporary

employment such as washing clothes, working on construction sites, working as house helps and seeking farm laborers jobs.<sup>[5]</sup> Food insecurity can also make lactating mothers develop psychosocial distress which can make them loose self-efficacy and thus compromise with values of exclusive breastfeeding. In countries where there is high prevalence of food insecurity such as Ethiopia.<sup>[5]</sup> and Tanzania.<sup>[4]</sup> and even those with rich settings as the United States.<sup>[6]</sup> households food insecurity was associated with higher rates of maternal depression and stress. If a lactating mother suffer distress or depression this could be a significant predictor of reduced breast feeding self-efficacy and this affects exclusive breastfeeding significantly.<sup>[6]</sup> Food insecurity and malnutrition are associated with the causes of psychological and physiological distress and this impairs breast milk let down in quantity and quality.<sup>[5]</sup> When lactating mothers suffer malnutrition due to lack of macronutrients and micronutrients like vitamin A, iron and zinc their milk output is affected downwards.<sup>[6]</sup>

The contribution of urban Agriculture to food and nutritional security in households with lactating mothers has not yet been well studied in Kenya. Knowledge on

crop and animal diversity, nutrition education, farming skills in the Mwiki area is scanty. Lactating mothers nutritional improvement and poverty eradication has led to reduction of sub-clinical Vitamin A deficiency which is prevalent throughout Kenya.<sup>[7]</sup> From the results of the baseline survey farmers in Kasarani Sub-County, did not diversify their farming practices to produce a variety of crops that could enhance better household food and nutrition security.<sup>[5]</sup> This has probably led to poor nutrition in the households affecting lactating mothers. They therefore find it difficult to practice exclusive breastfeeding for six months as recommended by World Health Organization.<sup>[7]</sup>

In urban areas the households most at risk of food insecurity and chronic malnutrition belong to the lowest-income groups which cannot afford to purchase adequate food. Many of these households comprise families of recent migrants who have failed to find regular employment.<sup>[8]</sup> Their income levels are often so low that they can afford to purchase only the cheapest and most basic foods, and since they cannot afford to rent housing they are forced to camp in makeshift shanty towns on the periphery of cities. Such families often cultivate tiny plots of land within their household area and keep small livestock as a basic survival strategy.<sup>[9]</sup>

World-wide, Urban and Peri-urban Agriculture (UPA) involves some 800 million people<sup>[10]</sup> and generates significant livelihood opportunities, for urban and peri-urban farmers and also for traders, input suppliers and other service providers along the value chain for domestic produce.<sup>[11]</sup> According to,<sup>[8]</sup> urban agriculture is helping people with food, especially in developing countries. Peri-urban commercial cultivation is a growing food supply enterprise of high-value crops, including tomatoes, onions, green vegetables and fruit, for a number of African cities. By practicing a diversified form of urban agriculture, poor urban workers are able to meet some of their nutritional requirements, especially those for minerals and vitamins, through the consumption of some of their produce.<sup>[1]</sup>

A report by the World Bank indicates that, 25% of the population in Nairobi is employed in urban and peri-urban agriculture. Urban agriculture is one of the main activities used by residents to eradicate poverty and sustain themselves. Kenya's leading development challenges today include alleviation of poverty and environmental management in the context of rapid population growth and urbanization. Kenya's population was 28.6 million people in 1999 and is expected to reach 43 million in the year 2020. According to the government statistics, the national level of absolute poverty increased from 44 percent in 1992 to 56 percent in 2002.<sup>[2]</sup>

In Nairobi alone, it is estimated that urban farmers contribute 50,000 bags of maize and 15,000 bags of beans annually and up to a quarter million chicken, about

45,000 goats and sheep, and 42 million liters of milk. This, in economic terms, means that milk alone generates up to Kshs. 800 million annually if priced at 20 Kshs. per liter. Most of it reaches the urban poor as either food or income. In 1998 there were 24,000 dairy cattle in Nairobi, worth roughly one billion shillings. In Kasarani Division, about 180,000 trays of eggs were produced, worth Kshs. 27 million. In the same year 110,000 kilograms of sukuma wiki were grown in Dagoretti, 240,000 kilograms in Langata and 260,000 kilograms in Westlands.<sup>[5]</sup>

Urban and peri-urban agriculture (UPA) is undertaken for three reasons: cash (mainly vegetables and livestock); food subsistence (including savings on food expenditure); and as a survival or risk buffering strategy.<sup>[11]</sup> It can also act as an income generating activity as farmers produce for markets or sell surplus, which contributes to a household's income security.<sup>[8]</sup> UPA is used as a strategy by many urban dwellers to improve their livelihoods and overall well-being.<sup>[5]</sup> It improves a household's access to food during times of shortage, instability or uncertainty.<sup>[12]</sup> It contributes to improved health among the urban population by providing highly nutritious and fresh foods.<sup>[13]</sup>

The objective of this study was therefore to identify the foods produced, in Mwanamukia peri-urban area, the proportion of the foods consumed and what is done with the surplus consumption.

### 1.1 Objective of the study

To assess the amount of food produced and utilized by lactating mothers in the household

### 1.2: METHODOLOGY

This was a cross sectional study targeting lactating mothers. The sampling unit was households. The study involved collection of data on foods produced, consumed and utilization of the remainder, socio demographic and socioeconomic characteristics of lactating mothers.

The area of study was Mwiki sub-ward, Kasarani ward, Kasarani sub-county. The sub-county has four Wards namely, Kasarani ward, Githurai ward, Ruaraka ward and Roysambu ward. Kasarani ward has 3 sub-wards; Mwiki sub-ward, Clay city sub-ward and Mwanamukia sub-ward. Mwiki has four villages namely; Maji-Mazuri village, Chieko village, Gituamba and Gitueko village. Mwiki Area is 11.5 square km. About half of the available land is used for Agricultural production. The average size of land is 50m x 50m. The main farming system is subsistence and it is usually intensive farming. Food crops grown are mainly maize and beans and horticultural crops in small quantities along the river banks.<sup>[5]</sup>

This was a baseline survey with a sample size of 260 respondents. Data on food production, amount produced, consumed and sold for income generation was collected

using a structured questionnaire. This was based on the formula by Fischer *et al.*, (1991):  $N = \frac{z^2 pq}{d^2}$ , where N is the sample size, z is the normal deviation (1.96) corresponding to 95% confidence intervals, p is estimated food insecurity in Nairobi at 32.9% , q is 1-p and d is the degree of the desired accuracy at 5%. The calculation yielded 236 households, plus 10% attrition gave a total sample of 260 households.

A pre-tested structured questionnaire was used to obtain information on the social demographic, social economic characteristics of the households, agricultural practices and production, food consumption patterns and coping mechanisms employed during periods of food scarcity by the lactating mothers.

A question guide for the Focused Group Discussion was developed to help gather information on lactating mothers’ diet adequacy, crop production, animal production and the challenges lactating mothers face in coping with food and nutrition insecurity. The observation checklist was used to collect data on, household farming practices, labor providers and crops produced. A pre-test of the interview schedule, focus group discussion guide and observation check- lists was done on households with lactating mothers focusing on the lactating mothers and their environment. The pretest was done in Ngomongo village which has similar characteristics as the study area. Vague questions were redefined or paraphrased and instruments were checked so as to measure the content that they were supposed to measure. These households had the same characteristics as those in the study but were not included in the study sample. The sub-county administration officer and the area chief were informed about the proposed research project. A research permit was obtained from the ministry of Agriculture, livestock and fisheries. This ensured proper coordination of the project and reduced suspicion among community members. The community members participated in the project voluntarily. They were also assured of strict confidentiality of information they provided to the researcher.

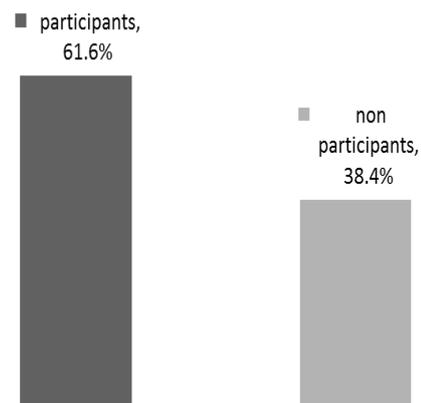
Before the data entry a data entry template was developed by the principal investigator in consultation with a biostatistician. Data entry was then carried out using SPSS (12.0.1) by the principal investigator immediately after data collection. The qualitative and

quantitative data was analysed using the (SPSS version 20) programme to generate frequencies, mean and standard deviations. Required coding and modification of data was done to fit the appropriate statistical method. The statistical package for social sciences (SPSS) was used for most analysis of this study.

**1.3: RESULTS**

**Urban Agriculture Participation by Households**

The results show that out of 260 respondents the urban agriculture participation was 61.6% against 38.4% non-participation.



**Figure 1: Urban agriculture participation.**

**Land Ownership, Food Production and Utilization**

**Table 1: land ownership.**

Ownership	n=260	Percentage
Own land	66	25.4
Rented	69	26.7
Resettled	15	5.5
Inherited	110	42.3

The study found out that almost a 3<sup>rd</sup> of the study population of Mwiki (67.8%) owned land to practice urban agriculture. The study also found out that (15.3%) had 250m<sup>2</sup> plots. Those who lacked land cited it as a hindrance to urban agriculture participation. Most of the respondents (42.3%) had inherited their land, 26.7% were renting, 25.5 % had bought their land and 5.5% had been resettled in the land they owned.

**Table 2: provision of labour and decision on what to plant.**

Gender	Percentage of Provision of labour	Percentage of decision on planting
Men	37	28.9
Women	62	71.1

More women (71.1%) decided on what crops to be planted compared to men (28.9%).

Results also show that lactating mothers were producing and utilizing a variety of food stuff the highest in production being beans and lowest crotalaria.

**Table 3: Amount produced and utilization.**

Food item	Percentage of Mothers producing	Percentage of own consumption	Percentage of mothers selling
Beans (dry)	28.4	18.4	10.0
Maize	26.5	26.5	0
Amaranthus	25.7	8	17.7
Cow peas	10.3	9	1.3
Black night shade	8	7	1.0
Pumpkin leaves	0.6	0.6	0
Kales	0.2	0.1	0.1
Spinach	0.2	0.2	0
Crotalaria	0.1	0.1	0

Out of the 26.5 % lactating mothers who were producing maize, all 26.5% consumed what they produced. Out 28.4% of lactating mothers produced beans 18.4 % consumed the beans and 10% sold, and out of 25.7% of lactating mothers produced amaranth, 17.7% was sold while 8% was consumed. Out of 10.3% of lactating mothers produced cowpeas leaves 9% consumed and only 1.3% was sold, other vegetables were produced in small quantities and were consumed at home as shown.

Overall most of the food produced 69.9% is consumed in the lactating mothers households while 30.1 % is sold.

## 1.4: DISCUSSION

### 1.4.1 Urban Agriculture Participation

The study showed that majority of the lactating mothers participated (62%) in urban agriculture production. These results are in line with a study done in Southern African cities by Frayne *et al.*, 2014, that showed that over 60% of the respondents in Blantyre in Malawi engaged in urban agriculture. In their study those that engaged in urban agriculture participated less frequently in provision of food handouts. In Botswana,<sup>[14]</sup> found that the benefits of participating in urban agriculture are primarily captured by high-income and often male-headed households. This results contrast this study in that those who participated in urban agriculture were from low-income area and more women than men participated and benefited from urban agriculture participation. In essence this means that urban agriculture participants in this study better accessed food which was readily available to them from their own farms. In this study lactating mothers who participated in urban agriculture had primary education and above and this same group was found to have normal BMI and some were overweight, compared to their counterparts who were non-participants and were illiterate who had majority who had under-weight BMI. This study is in agreement with a study done by<sup>[15]</sup> which found a significant statistical difference in the crops yields of educated participants and non-educated participants. In their study<sup>[16]</sup> in Kampala Uganda found the frequencies of occurrence of underweight and stunting in children more significantly lower in families that were involved in urban agriculture. This concurs with the results of this study which found a statistically significant difference in

the frequencies of occurrence of underweight in lactating mothers who were non-participants of crop production ANOVA ( $P \leq 0.05$ ).

### 1.4.2: Land Ownership, Food Production and Utilization

The study noted that, majority of the households' land was 250m<sup>2</sup>. Majority (57.3%) owned the land they were farming on and where they did not; they were either renting or acting as caretakers. Much more other women would like to carry out urban agriculture in the area but they are limited by space. Farming space in this area is being consumed by coming up of commercial building which are viewed to be profitable than farming. Monstier's study contradicts these findings by indicating that home subsistence farmers have land below 100m<sup>2</sup> but concurs that they have secured land access. Three studies also observe that some urban farmers cultivate publicly (government) and privately (commercial firms, individual lease holders) owned land. The farmers generally have explicit use rights extending over an agreed time period, during which tenants also act as 'caretakers' (Woodhouse *et al.* 2000;<sup>[17,16]</sup> ascertains that urban agriculture contributes to food security through small plots of land.

The current study found that, maize and beans were produced more than any other crops. Lactating mothers also produced amaranth more than other vegetables. This is in line with what,<sup>[5]</sup> described as the first type of farming system found in Nairobi. The *small-scale subsistence crop cultivation* which is dominant with the most common crops cultivated being maize, beans and kales. In their study,<sup>[18]</sup> reiterate that, in Nairobi alone, urban farmers contribute 50,000 bags of maize and 15,000 bags of beans annually.

These findings are in line with what,<sup>[19]</sup> ascertained in his study in Nigeria. That the growing of maize, vegetables, fruits and rearing of chickens were the main urban agricultural activities practiced in many African cities. The findings concur with<sup>[20]</sup> in their study in Cameroon who noted that, home subsistence farmers' mainly grew leafy vegetables, cassava, plantain, maize, fruits, rice and kept goats, sheep and poultry.<sup>[21]</sup> also noted that in Nairobi, the contribution of city farmers in the way of

tomatoes, beans, cowpeas, maize among many others, makes a profound contribution to urban food consumption. This clearly indicates that these crops were widely produced and in higher quantities. These findings differ with what,<sup>[5]</sup> found in their study that in Mwiki Nairobi, residents did not produce enough food for home consumption but had to get the highest proportion of their foods from purchases.

Research by the Urban Harvest initiative of the Consultative Group on International Agricultural Research (CGIAR) in 2002- 2004 in Cameroon found that the majority of producers cultivated maize and traditional leafy vegetables on plots in upland areas.<sup>[1]</sup> According to,<sup>[9]</sup> the choice of crops for production in urban areas is primarily determined by whether food is being produced for household consumption, subsistence, or for sale.

The current study established that the farm produce was for home use and the surplus for sale. The amount sold was small and could not be counted to help pay family bills and provide money for school fees and health bills. This is because farming took place in small plots sizes. Mudzengerer,<sup>[7]</sup> concluded that women typically venture into urban agriculture as a way of supplementing their income. For women in developing countries, urban agriculture is a way of improving their income as well as a means to provide for their families,<sup>[34,25]</sup> in their study, also note that, home subsistence farmers' objective was mainly home consumption.

This study partially corresponds with,<sup>[25]</sup> who noted that more than 70% of urban growers in Tamale, Ghana, grew vegetables primarily for market and less for their own consumption.<sup>[25]</sup> and,<sup>[26]</sup> further emphasizes that 87.5% of produce from female headed families is for consumption. Smite,<sup>[27]</sup> explain that production for self-consumption and barter increases food security of the poor by making it possible to obtain food they could not otherwise afford or find. As these three studies have clearly pointed out,<sup>[28,29]</sup> urban agriculture provides a large proportion of food consumed in households.

Majority of respondents preferred to plant beans and maize in larger quantities than other food stuff produced. This is due to the fact that diets of most Kenyan poor are comprised of the staples and amount of beans used is more since it can be used with many dishes in the household, beans can be used as stew for chapatis, rich and ugali and can be used by mixing with maize to produce githeri (mixture of maize and beans) a common Kenyan dish. Production of food and animals for home consumption is a responsibility which is carried out mainly by women.<sup>[34]</sup>

Most of the crops produced as shown in table 2.1 were used for home consumption and only small amount was sold. This is due to the fact that they produced in small quantities and owing to their urge families getting extra

for sale was difficult. The decision on what to produce and even how the food was utilized was mainly the responsibility of women in the household, these results agree with the results of a study done in Benin and South Cameroon by,<sup>[30]</sup> where women were seen as the best managers of the farm, accorded the best freedom in decision making, however their decision making power in farming is limited to foods with low returns and those that involve less advanced technologies.

#### 1.4.3: Decision on Crop Production

In this study, more women (72%) made decisions on what to plant in the farms than men (28%). There were also more women (62%) who provided labor in the farms than men (38%). This could be because most women were housewives and were using the farm as part of their occupation and source of food and income for the family. This also explains why lactating women gave their infants complementary feeds before six months as per,<sup>[6]</sup> recommendations because they needed to go to the farm and doing other income earning activities like cleaning clothes for pay to their neighbors. This is as per observations made by the researcher in the course of research period. This study concurs with the results of the study done by,<sup>[31]</sup> that describes that women were the greater part of urban farmers worldwide. These results agree with the results of a study done in sub-saharan African cities by,<sup>[32]</sup> which revealed that women were responsible for the cultivation of urban agriculture plots and he suggested two reasons for it namely; farming of small plots close to the home can readily be accommodated into women's daily work routines and that men generally perceive urban agriculture as a marginal activity rather than a serious business endeavor. Another study done in Malawi by,<sup>[33]</sup> states that women obtained more money from urban farming than men. These results agree with this study in that women reported that they participate in urban agriculture for provision of ready fresh food and since they were lactating mothers it enabled them give individualized care to their infant by frequenting breastfeeding and yet carrying out farming activities within the homestead. Some respondents were not involved in urban agriculture production they relied on food purchases for the household food consumption.

However different findings have been observed in other studies like in Kumasi Ghana, majority (98%) of the farmers practicing urban agriculture were males. Females were not so much involved in the vegetable farming,<sup>[23]</sup> Also in Gweru city, Zimbabwe, males were 66.4% and female 33.62%.<sup>[32]</sup> This difference between their study results and this study results could be because the kind of urban farming carried out by respondents is on small a plot which was able to produce enough food for the family and sale to cater for other family requirements like school fees, medical care and clothing among others.

This study showed that Women were the decision makers when it came to what crop to plant. They also

provided the labor. This is the main domain where women are sole decision makers and they plant the crops they believe will benefit their families in terms of nutrition and food security. In<sup>[7]</sup> concluded that women play a crucial role in sustainable urban development. He further explains that labour is provided by women although men are sometimes hired to till and weed the land.<sup>[4]</sup> established the same. Women provided labour, especially the middle aged and the elderly, whilst their male counterparts view urban agriculture as part of women's household chores. In Kampala, for example, 80% of the urban farmers were women.<sup>[30]</sup>

Labour was provided by women, this concurs with a study done.<sup>[7]</sup> which says that labour is the only resource that women have at their disposal in many parts of Africa.<sup>[9]</sup> Observed that in Eldoret, Kenya, 25% of women farmers' assumed sole responsibility for land preparation.<sup>[8]</sup> Also documents that, in Kenya 56% of labour in urban agriculture is practiced by women. Studies in Nairobi by,<sup>[8]</sup> also showed that 50% of the urban farming is carried out mainly by women who are concerned about food production for the family. Research by the Urban Harvest initiative of the Consultative Group on International Agricultural Research (CGIAR) in Cameroon also found that the majority of producers were women.<sup>[35,36]</sup> Found that in Dar es Salaam, women are traditionally responsible for feeding the family and also for home gardening; men hardly play a role.

## 2: CONCLUSION

Majority of the respondents participated in urban agriculture. Maize and beans were the most preferred crops and amaranth and cowpea leaves were the most preferred vegetables. More than half of the respondents owned land to practice urban agriculture and one quarter of them had inherited the land they had. More women than men made decisions on what crops to plant. They also provided labor for agriculture on the farms. More respondents consumed and also sold the produce they farmed.

## 2.6 RECOMMENDATIONS

Lactating mothers who are among the vulnerable groups that suffer malnutrition should be encouraged to produce more crops using current technologies on food production where space is a limiting factor such as multistory, organoponics and hanging gardens.

## 3: ACKNOWLEDGEMENT

I take this opportunity to thank God for having blessed me with sound health throughout the research process. I especially thank my husband Miriti Patrick for being there for me during the research process, funding the project and allowing me to use family time for this study. God bless you so much. I would also like to thank my children Malcolm Miriti and Carol Miriti for being there for me encouraging and editing my work. I would like to

thank the my parents Junias Nkirigacha and Saberia Igoji Nkirigacha for their support during the research period and providing emotional and psychological support to make part of this study.

## REFERENCES

1. Midmore, D.J., & Jansen, H.P.G. Supplying vegetables to Asian cities: is there a case for peri-urban production? *Food Policy*, 2003; 28: 13-27.
2. FAO. (2012). Growing greener cities in Africa. First status report on urban and peri-urban horticulture in Africa. Rome, Italy: Food and Agriculture Organization of the United Nations. Available from [www.fao.org/ag/agp/greenercities/pdf/GGC-Africa.pdf](http://www.fao.org/ag/agp/greenercities/pdf/GGC-Africa.pdf).
3. Obuobie, E., Drechsel, P., Danso, G. and Raschid-Sally, L. Gender in open-space irrigated urban vegetable farming in Ghana. *Urban Agricultural Magazine 12, Gender and Urban Agriculture*, 2004; 13-15.
4. Kombe, W. J., "Land use dynamics in peri-urban areas and their implications on the urban growth and form: the case of Dar es Salaam, Tanzania." *Habitat International*, 2005; 29(1): 113-135.
5. Nkirigacha E.,M, Imungi J.K, and Cheming'wa G. Urban Agriculture and Food Security in the Low Income Households of Mwiki Location, Nairobi County. *G.J.B.A.H.S*, 2015; 4(4): 30-34.
6. Mudzengerere, F. H., The Contribution of Women to Food Security and Livelihoods through Urban Agriculture in the City of Bulawayo, Zimbabwe. *Zimbabwe Journal of Science & Technology*, 2014; 7(2012): 6.
7. Armar-Klimesu, M. Urban agriculture and food security, nutrition and health. In N. Bakker, M. Dubbeling, S. Gundel, U. Sabel-Koschella, & H. de Zeeuw (Eds.), *Growing cities, growing food: Urban agriculture on the policy agenda. A reader on urban agriculture...* GTZ/DSE, Germany, 2000.
8. Cofie, O., *Emerging Issues in Urban Agricultural Development in West Africa*. International Water Management Institute, Accra, Ghana, 2009.
9. Cofie, O., Veenhuizen, R., and Drechsel, P., "Contribution of Urban and Peri-urban Agriculture to food security in Sub-Saharan Africa." Paper presented at the Africa session of 3rd WWF, Kyoto, 17th March, 2003
10. Bush, R. Food Riots: Poverty, power and protest. *Journal of Agrarian Change*, 2010; 10(1): 119-129.
11. Abubakari, A. H., & Mahunu, G. The role of urban horticulture in urban development – a case study of the Tamale Metropolis. *Ghana Journal of Horticulture*, 2007; 6: 129-133.
12. Abubakari, A. H., & Mahunu, G. The role of urban horticulture in urban development – a case study of the Tamale Metropolis. *Ghana Journal of Horticulture*, 2007; 6: 129-133.
13. Cofie, O., *Emerging Issues in Urban Agricultural Development in West Africa*. International Water Management Institute, Accra, Ghana, 2009.

14. Cohen, M., & Garrett, J. The food price crisis and urban food (in)security. *Environment and Urbanization*, 2010; 22(2): 467-482.
15. Foeken D & Mwangi A. Increasing food security through urban farming in Nairobi, 2000.
16. Kombe, W. J., "Land use dynamics in peri-urban areas and their implications on the urban growth and form: the case of Dar es Salaam, Tanzania." *Habitat International*, 2005; 29(1): 113-135.
17. Kutiwa, S., Emmanuel, B. and Dimitri, D. Urban Agriculture in Low Income Households of Harare: An Adaptive Response to Economic Crisis. *Journal of Human Ecology*, 2010; 32(2): 85-96.
18. Cofie, O., Veenhuizen, R., and Drechsel, P., 2003. "Contribution of Urban and Peri-urban Agriculture to food security in Sub-Saharan Africa." Paper presented at the Africa session of 3rd WWF, Kyoto, 17th March, 2003.
19. F.A.O. 1997. Chapter 5 - Promotion of food and dietary diversification strategies to enhance and sustain household food security retrieved on 4<sup>th</sup> August, 2015. from <http://www.fao.org/docrep/w0078e/w0078e06.htm>.
20. Magnusson, U., Bergman, K. F., Katunguka-Rwakishaya, Eli. 2014. Introduction to urban and peri-urban agriculture for food security in Urban and Peri-urban Agriculture for Food Security in Low-income Countries – Challenges and Knowledge Gaps. SLU-Global Report, 2014; 4.
21. Corbould, C. Feeding in the Cities: Is urban agriculture the future of food security. *Future Directions*. Retrieved from [www.futuredirections.org.au/publications/food-and-water-crises/1406-feeding-the-cities-is-urban-agriculture-the-future-of-food-security.html#sthash.ruFwOIIS.dpuf](http://www.futuredirections.org.au/publications/food-and-water-crises/1406-feeding-the-cities-is-urban-agriculture-the-future-of-food-security.html#sthash.ruFwOIIS.dpuf), 2013.
22. Gregory, P. A *Synthesis of Peri-Urban Research of Kumasi*, Hubli-Dharwad and Kolkata PUIs, NRSP, Final Report R, 2005; 8491.
23. WHO, Actions and accountability to accelerate the world's progress on nutrition, 2014.
24. Mougeot, L. *Urban food production: Evolution, official support, and significance*. Cities Feeding People Report No. 8. Ottawa, Ontario, Canada: International Development Research Centre, 1994.
25. Mudimu, G.D. Urban Agriculture in Harare: New Gender and Socio-economic Dimensions. Paper presented at the Regional Stakeholder/Experts Meeting on Urban Agriculture in Southern Africa, 15-19 March 2001 University of Stellenbosch, Cape Town South Africa, 2001.
26. Moustier, P., and Danso, G., "Local Economic development and marketing of urban produced food. In van Veenhuizen, R. (ed), *Cities Farming for the Future*, Urban Agriculture for Green and Productive Cities. RUAF Foundation, IDRC and IIRR, 2006.
27. Nkurunziza, E., "Informal mechanisms for accessing and securing urban land rights: the case of Kampala, Uganda." *Environment and Urbanization*, 2007; 19(2): 509-526.
28. Nugent, R., "The impact of urban agriculture on the household and local economies." In N. Bakker, M. Dubelling, S. Gundel, V. Sabel-Koschella, and A. Zeeuw (eds.), *Growing Cities, Growing Food: Urban Agriculture on the Policy Agenda*. Feldafing, Germany: Food and Agriculture Development Centre (ZEL), 2000.
29. Nugent, R.A. Using economic analysis to measure the sustainability of urban and periurban agriculture: A comparison of cost-benefit and contingent valuation analyses. Presentation at workshop on Appropriate Methodologies in Urban Agriculture, Nairobi, Kenya, 2001.
30. Obuobie, E., Drechsel, P., Danso, G. and Raschid-Sally, L. Gender in open-space irrigated urban vegetable farming in Ghana. *Urban Agricultural Magazine 12, Gender and Urban Agriculture*, 2004; 13-15.
31. Scott, C., Faruqui, N., & Raschid-Sally, L. Wastewater use in irrigated agriculture: Confronting the livelihood and environmental realities. CAB International, 2004.
32. Simiyu, R., & Foeken, D. Gendered divisions of labour in urban crop cultivation in a Kenyan town: implications for livelihood outcomes. *Gender, Place & Culture*, 1-17. doi:10.1080/0966369X.2013.810602, 2013.
33. Smit, J., Nasr, J and Ratta, A. Chapter 7-Benefits of Urban Agriculture in Urban Agriculture *Food, Jobs and Sustainable Cities*. The Urban Agriculture Network, Inc., 2001.
34. Woodhouse, P., Bernstein, H. and Hulme, D., *African enclosures? The social dynamics of wetlands in drylands*. James Currey, Oxford, 2000.
35. Women Watch Gender Perspectives in Climate Change. Issues paper for interactive expert panel on emerging issues, trends, and new approaches to Issues affecting the situation of women or equality between men and women. 52nd session of the commission on the status of women, 2008.
36. Zezza, A., & Tasciotti, L. Urban agriculture, poverty, and food security: Empirical evidence from a sample of developing countries. *Food Policy*, 2010; 35(4): 265-273.