

Full length Research paper

Pathways of meeting the urban household food security challenges through urban agricultural dynamics in the Buea Municipality, South West Region, Cameroon

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20th century urban explosion has provoked looming acute food shortages therein especially in developing country cities, which urban dwellers seek to mitigate through urban agriculture ventures to match food supply with food demand. This study sought to establish the urban food security dilemma in Buea municipality and project urban agriculture as a sustainable panacea. 120 respondents selected from five neighbourhoods (Molyko South Area, Malingo, Ndong, Sossoliso and Check Point) by stratified random technique provided primary data obtained through questionnaires complemented by direct field observations and measurements. Key results from data analysed through descriptive statistical measures and presented in tables, graphs and pictures, reveal that 61% of the Buea urban households rarely have sufficient food security (quantity, quality, frequency) principally due to insufficient funds (76.7%) and current socio-political upheavals in the area (36.7%). The greatly diversified urban farms, produce variety of vegetables, cereals, tubers fruits and animal proteins (fowls, pigs) with 40% for subsistence and 45% sold in Buea, confirming (65%) urban agriculture as urban food shortages solution. Unfortunately it faces key challenges as land scarcity (67%), seasonal variability (65%) and pests and diseases (54%). To uphold its food security role, government should support urban farmers to better combat these setbacks.

Key words: Buea Municipality, Challenges, food security, food demand and supply, urban agriculture, urban farmer

INTRODUCTION

Urbanisation has been one of the most significant processes in transforming all societies, particularly since the early Twentieth Century. Everywhere, cities are synonymous with modernization, economic development, social progress and cultural innovation. However, the nature of urban development, particularly in Sub-Saharan Africa, including Cameroon, seriously constrains the agricultural productivity of cities and hence reduces the extent to which the food needs of households can effectively be met (Olubunmi, 2011). The twenty-first century has often been described as the ‘the first urban

century’ (Stewart *et al.*, 2013) due to unprecedented rural exodus which has led to rapid urban growth. As such, today unlike never before, many areas worldwide are fast becoming urbanized, with more than half of the world’s population living in urban areas, a proportion that is expected to reach approximately 70% by 2025 (UN-Habitat, 2010). The urbanisation process in Africa is projected to be 54% in 2025 (United Nations, 2022). This increasing global trend in urbanization places enormous demands on urban food supply systems. This is so as Towns and cities are growing rapidly especially in developing countries which are often accompanied by high levels of poverty and hunger, leading many urban dwellers to engage in farming activities to help satisfy their food needs (Corbould, 2013).

Securing high quantity and quality food for the burgeoning urbanites particularly in intermediary cities in

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the developing world remains a great obstacle to the attainment of several SDGs such as 1(End poverty in all its forms everywhere); 2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture); 3 (Ensure healthy lives and promote well-being for all at all ages) and 11 (Make cities and human settlements inclusive, safe, resilient and sustainable). Urban Agriculture has been established as the new dimension in agriculture that redressed the odds. This paper starts with a summary review of existing literature, proceeds with the problem statement and the study area, elaborates the research procedures, presents the results and findings, discussions, conclusion, acknowledgements and references.

STATEMENT OF THE PROBLEM

Over the past decades, there has been a growing recognition by policy makers, policy agencies and researchers that more than 50% of the world’s population now live in cities. These continuous increases in human numbers in cities have come with unprecedented problems relating to poverty, food shortages and malnutrition. Ideally, increase urbanisation was supposed to be accompanied by measures to boost food production and the wellbeing of the urban population. The urbanization trend in most Cameroonian cities is on a steady increase with Buea not being left out. The ongoing socio-political crises plaguing the two Anglophone regions of Cameroon have further exacerbated the rural exodus situation in this region. In

this regard therefore, there has been an increase in the population of the Buea Municipality as it now hosts a huge population from Ndian and Meme Divisions as well as some of the people who fled from the North West Region of Cameroon, a majority of whom are low income earners., there has been increase pressure on land for food crop cultivation and housing construction to cater for the growing population. Food supply has overtime become insecure with the urban poor being the most vulnerable to this situation of food insecurity as prices of food stuffs are on a steady rise every day above their family food disposable income. It is therefore against this background that there is a need to tackle this situation in order to limit the negative consequences that usually come with food insufficiency.

Location of study area

Buea Municipality is located between Latitude 4° 2’40”N and Latitude 4° 18’0” North of the Equator and between Longitude 9° 12’21” E and Longitude 9° 19’42” East of the Greenwich Meridian as shown in Figure 1. It is bounded to the north by the tropical rainforest on the slope of Mt. Cameroon (4095m above sea level), that extends to the beautiful sandy beaches of the Atlantic Ocean of Limbe. The municipality also shares boundaries with Limbe Sub-division to the south west, Tiko Municipality to the southeast, Muyuka Municipality to the east and Idenau Municipality to the West. Buea is located on the eastern slopes of Mount Cameroon.

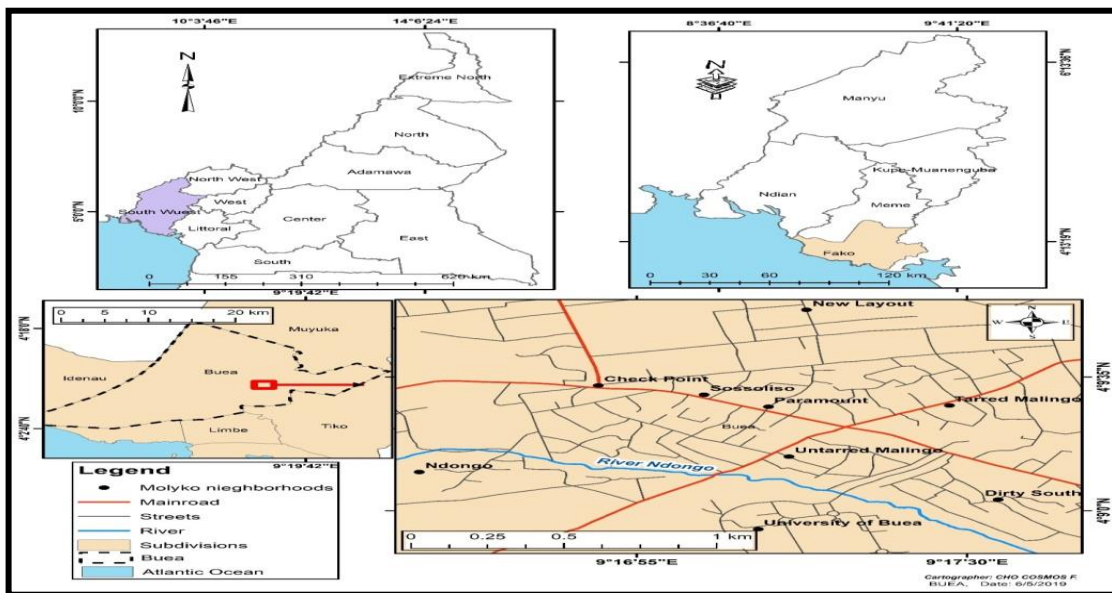


Figure 1: Study Area sites within Buea Municipality

LITERATURE REVIEW

Several views exist on the what, how and why of the concept of urban agriculture and food security. In a study

by Stewart *et al.*, (2013), they considered the definition of urban agriculture by Mougeot (2000) which stated that “urban agriculture is an industry located within or on the fringe of a town, a city or a metropolis. It grows, processes

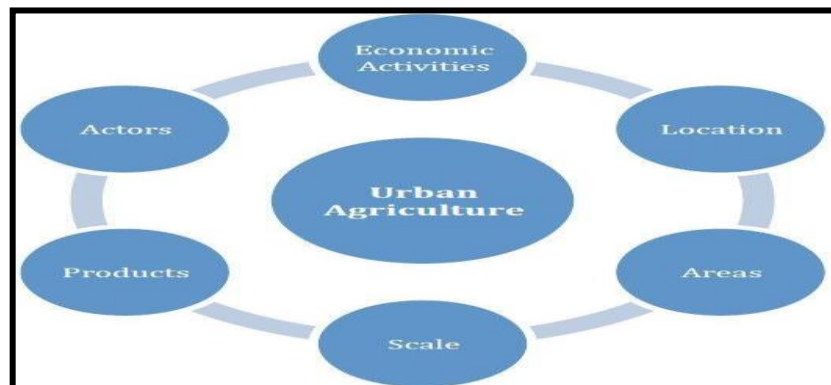


Figure 2: Framework showing the Dimension of Urban Agriculture
Source: Stewart *et al.*, (2013)

and distributes a diversity of food and non-food products, using largely human and material resources, products and services found in and around that urban area. It in turn supplies human and material resources, products and services largely to that urban area". Urban farming therefore may take a number of dimensions as shown by Figure 2. These include: the type of economic activities carried out, the location where it is carried, the area, the scale of cultivation, the products they produce and actors involved.

Food security is a flexible concept which originated in the mid-1970s in the discussions of international food problems at a time of global food crisis. The initial focus of attention was primarily on food supply problems (Edward, 2002). Drawing from the World Food Summit of 2001, FAO (2002) said food security is "a situation that exists when all people at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and health life". The various dimensions of food security are shown on Figure 3 based on FAO's definition (2008).

The dimensions of food security have been identified according to Wen and Elliot (2019) that "Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life". Food security has four dimensions: food availability, food accessibility and food utilization and stability over time. Food availability is concerned with the production and supply of crops. Food Accessibility has to do with the economic and physical access to food relating to the issue of affordability. IPCC's Fourth Assessment Report states that there will be approximately 200-600 million hunger stricken people around the world by 2080. Food stability means supply of sufficient food at all times. Food is today limited in the South West Region of Cameroon partly accounted for by the ongoing socio-political crisis plaguing the two Anglophone regions of the country.

Farmers have limitations in going to their farms as often as possible as there are gun shots almost invariably in

most of their farm localities. Transportation of food has also become very expensive which is still blamed on the crisis. Recent report by UNICEF (12 July, 2023) on **Global Hunger** exposed that while global hunger numbers have stalled between 2021 and 2022, there are many places in the world facing deepening food crises. Over 122 million more people are facing hunger in the world since 2019 due to the COVID-19 pandemic and repeated weather shocks and conflicts, including the war in Ukraine. UNICEF projected that by 2050, 70% of the global population will reside in cities. This significant demographic shift necessitates a reorientation of food systems to cater for these new urban populations and eradicate hunger, food insecurity, and malnutrition. This situation is already a dire necessity in Buea now.

Many researchers have established the mammoth contributions of urban agriculture to food security in cities. Urban agriculture is growing in popularity and is becoming "an integral component of the push to improve food quantity and quality in neighbourhoods where healthy food is scarce or not readily available" (Asongwe *et al.*, 2014). Urban agriculture can make an important contribution to household food security, especially in times of food crisis or food shortages. For example, about, 70% of Cameroon's population depends on agriculture and animal husbandry for their livelihood (World Bank, 2011). Urban Agriculture is thought to increase food security through two main path ways, namely, improved access to food and increased household income. The conceptual framework on the relationship between urban agriculture and food security is on Figure 4.

The potential contributions of urban agriculture to livelihoods within urban areas therefore cannot be underestimated since urban agriculture has long been recognised for its critical role as an urban survival strategy in the cities especially those of the Global South. This is clear as home grown foodstuffs increases the total amount of food available to a household and thus can reduce hunger and malnutrition. At the same time, the availability of fresh, home grown food products, fruits and vegetables, advances the nutritional status of household



Figure 3: The dimensions of Food Security
Source: Wen and Elliot (2019)

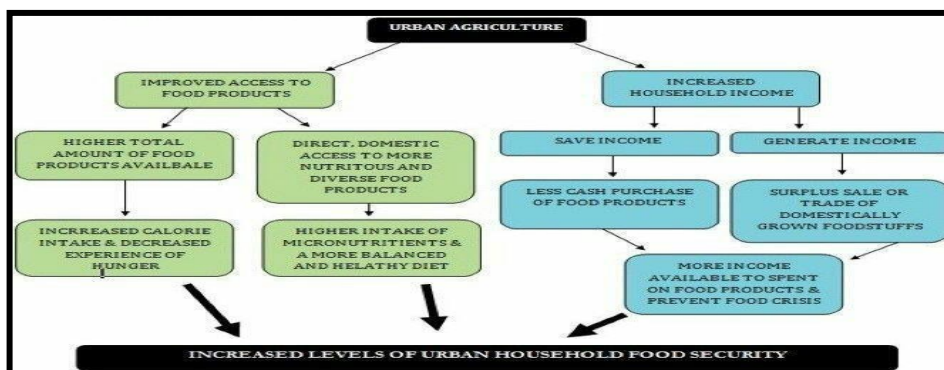


Figure 4: Conceptual Framework on the Relationship between Urban Agriculture and Food security
Source: Stewart *et al.*, (2013)

members and thereby improves health. Direct access to food then allows particularly poor households to consume a more diverse diet than they would otherwise be able to afford. For example, especially animal husbandry is believed to provide an important source of animal protein, which is commonly limited in poor households' diets due to income constraints (Stewart, *et al.*, 2013, and Binns & Lynch, 1998). Urban and peri-urban agriculture (UPA) is "one mechanism that plays a key role in enhancing access to and distribution of food in urban areas and, thus filling the hunger gap" (Lee-smith, 2010). Urban populations depend on the reliable and stable availability of food products, as well as affordable and convenient access to them. It is against this background that this study sets out to assess the nature of urban agriculture, urban agricultural challenges and their implications on household food security in the Molyko South Area, Malingo, Ndongo, Sossoliso, and the Check Point areas of the Buea Municipality, South West Region of Cameroon. As such, it will look at the key concepts of urban agriculture and concept of food security and examine the contributions of urban agriculture to food security and the challenges faced in urban agriculture.

SCOPE AND JUSTIFICATION

The study was conducted in the Buea Municipality with particular emphasis on Molyko South Area, Malingo,

Ndongo, Sossoliso, and the Check point areas as they constitute areas of rapidly growing populations as they host the thousands of students that flock to Buea to attend the higher institutions and people escaping from the war rocking the country sides. Before now, these zones were farmlands which have today lost their agricultural impetus. With rapid urbanisation of this former agricultural town it was necessary to analysis the food challenges that have arisen and establish the place of urban farming in solving the issue. The period considered for the study is from January 2020 to June 2023 as it coincides with peak terror moments of the socio-political crisis period which has significantly compromised rural food supplies systems to feed the many urban dwellers.

MATERIAL AND METHODS

This survey study employed a mixed research design using both the quantitative and qualitative methods to gather and process the relevant data for the study. The research instruments used were questionnaires for sampled population and digital cameras to snap photographs for illustrations. This study made use of both primary and secondary sources of data. Primary data were collected through field observations and complemented by use of questionnaires. Field obser-

vations captured the nature of urban agriculture (the types of crops planted and characteristics of the farming area) and problems plaguing the activity. The questionnaires were used to collect information household perception of their food situation, urban farmers' views on the nature of urban agriculture and its contributions to food security and constraints to food

security. Data to assess the variability in food security was sourced from indicators as quantity of food, sizes and frequencies of meals, ability to comfortably consume food of one's choice at any given moment. The intensity of food problems was rated on a frequency scale of four weeks with gravity assessment at three temporary scales shown on Table 1.

Frequency	Description	Interpretation (Severity index)
Rarely	once or twice in the past four weeks	Not severe (Hunger threat)
Sometimes (Seldom)	three to ten times in the past four weeks	Severe (Hunger stricken)
Often (Frequent or regularly)	more than ten times in the past four weeks	Very severe (Near to full famine)

The stratified random sampling technique was employed to administer the questionnaires. To avoid bias, the study area was stratified into population clusters and those of Malingo, Check Point, Molyko South Sosoliso and Molyko neighbourhoods selected for study because they constitute areas of high population concentration. The 120 respondents were then selected from these zones randomly.

Secondary data were gotten from text books, journals as well as the internet sources. This constituted literature review for the background on urban agriculture and related concepts used in the study.

The data collected were analysed using descriptive statistical tools of percentile and the frequency distributions presented on tables, bar and pie charts.

RESULTS AND DISCUSSION

Table 2: Populations views on Food quantity accessed and frequency of occurrence

SN	Questions	Response option	Percentage of Respondents
1	In the past four weeks did you or any household member have to eat a smaller meal than you felt you needed because food was not enough ?	No	50
		Yes	50
	How often did this happen?	Rarely (once or twice in the past four weeks)	50
		Sometimes (three to ten times in the past four weeks)	27
Often (more than ten times in the past four weeks)		23	
2	In the past four weeks did you or any household member have to eat fewer meals in a day because food was not enough ?	No	40
		Yes	60
	How often did this happen?	Rarely (once or twice in the past four weeks)	50
		Sometimes (three to ten times in the past four weeks)	27
Often (more than ten times in the past four weeks)		23	
3	In the past four weeks was there food of any kind in your household to eat?	No	71.7
		Yes	28.3
	How often did this happen?	Rarely (once or twice in the past four weeks)	67
		Sometimes (three to ten times in the past four weeks)	33
Often (more than ten times in the past four weeks)		26	
4	In the past four weeks, did you or any household member go to sleep hungry because there was not enough food?	No	61.7
		Yes	38.3
	How often did this happen?	Rarely (once or twice in the past four weeks)	74
		Sometimes (three to ten times in the past four weeks)	26
Often (more than ten times in the past four weeks)		26	
5	In the past four weeks, did you or any household member go a whole day and night without eating anything because food was not enough?	No	75
		Yes	25
	How often did this happen?	Rarely (once or twice in the past four weeks)	60
		Sometimes (three to ten times in the past four weeks)	40
Often (more than ten times in the past four weeks)		26	

Source: Summary of questionnaire analysis

The most striking result from Table 1 reveals that, 50% of the population did not have enough food to eat as they

are eating smaller quantities of food. 50% of these held it rarely occurs but up to 23% of the households did not

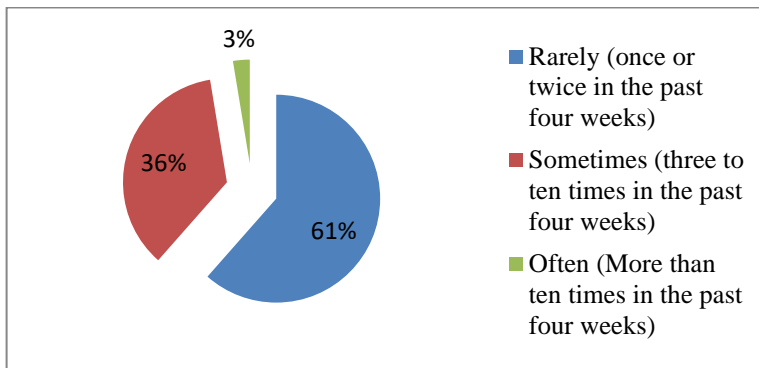


Figure 5: Frequency distribution of household's food sufficiency
Source: Questionnaires Analysis

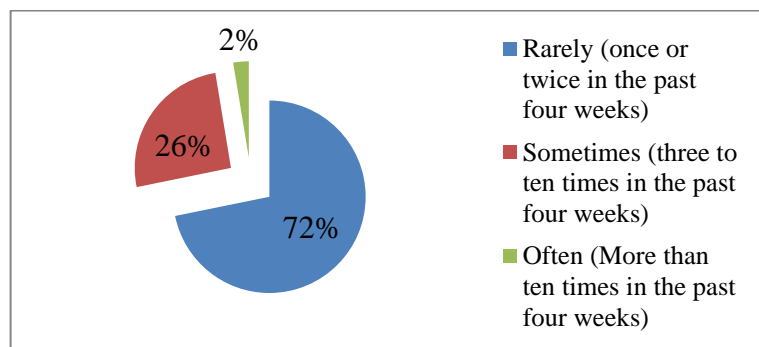


Figure 6: Frequency distribution of the extent of difficulty in affording choice food
Source: Analysis of questionnaires

have food of any kind to eat, though the situation has not reached starvation proportions because none declared its frequent occurrence, while the bulk (67%) of those suffering it said it is rare than regular (occurrence sometimes). Up to 25% of the of the respondents declared that in the past four weeks, some of the household members went a whole day and night without eating anything because there was not enough food. Furthermore it was established that 60% of the households are faced with a situation where household members are having fewer meals than before and this very severe with 23% of them. This indicates situations of growing under nourishment in the area. Some 28.3% of the respondents revealed that some members of their households did not have foodstuff of any time to consume. This situation is not yet too severe as 67% of them hold that it seldomly occurs while 33% of the households face it just sometimes. Findings further revealed that 65% of the sampled households were disturbed because there were highly uncertain of securing enough food while just 35% of them confirmed food security. Figure 5 exposes that that 61% of those uncertain of guaranteed of a constant food supply, faced this rarely (about once or twice in four weeks); 36% sometimes (about three to ten times in four weeks) while 3% face the situation more (more than 10 times in four weeks). In terms of severity index, the situation is worrisome but not yet severe to cause alarm. Household satisfaction was used as an index to assess

the food quality. Here respondents within households were asked whether in four weeks, any household members were not able to eat the kinds of foods they preferred. The results revealed that 46% of the households declared that some household members were unable to eat the kinds of foods they would have loved to eat because of inadequate resources to afford while 53.3% did not. Figure 6 shows that there was a disparity in the frequency of this inability as about 72 % of the households rarely faced this situation; 29% face it sometimes while just 2% face it frequently (more often). The overall conclusion from assessment of food quantities consumed by households revealed that 50% of the population noted that in four weeks, household members had to eat little quantities of meals than they needed because there was not enough food while 50% did not experience such situation. This insufficiency of food was experienced rarely by 50% of the households confronted by the situation, whereas 27% experienced this sometimes and 23% face it more regularly. The facts gathered from the sampled households reveal a tendency towards a food insecurity situation with varying degree of severity. The above food insufficiency issue gets elevated by the lack of awareness within farmers with worse off financial conditions like the vulnerable faring population in the Buea Municipality. According to Srivastava, (2012), a very high percentage (46 percent) of the children between three and six are malnourished which justifies the requirement for an increase in crop production that in

turn will improve food security, having a positive effect on the overall economy. It is therefore important to establish the constraints to food security in Buea because the growing food insecurity situation which seems imperceptible today can aggravate in future if not tackled now when it is at its minimum.

Constraints to food security

The concept of food security constraints has been defined by world bodies like the Food and Agricultural Organization (FAO), the World Health Organization

(WHO) as those negative factors that hinder or delay people's access to food that will meet their food desire. The sampled population identified some of these constraints in the Buea Municipality to be; limited financial resources (76.7%), limited land for cultivation (50%), urban hooliganism through theft of farm produce (50%) and the current socio-political upheavals in the area (36.7%). Climate variability and change also constitute another constraint of food production systems. It has been established that climate variability and change have a very huge effect on agricultural output (Parry and Rosenwieg,

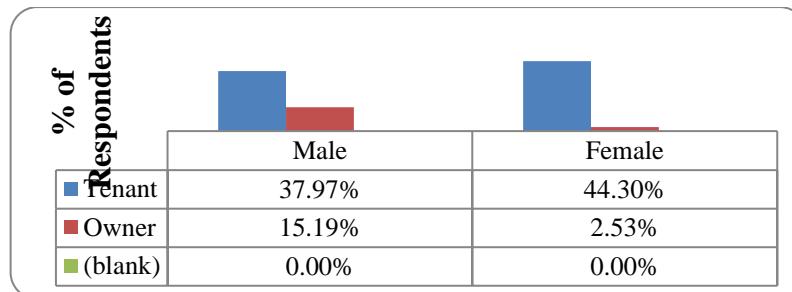


Figure 7: Land tenure status of urban farmers
Source: Field Survey

1994 and Rogerson, 2000). In the study area, individual farmers strive to create reliable food self-sufficiency systems within the very limits of the study area. This has inevitably intensified urban agriculture in the study area. In this regard therefore, according to FAO report, (2008), there can be two main implications of changing agricultural patterns and productivity on food security in developing countries. Firstly, variations in the productivity affect food security at a national as well as at a global level. Due to high dependency of the country on its own food production and its scarce financial and technological resources to import/export to other countries, it is difficult for these low income, developing countries to deal with a shortage in the supply of food grains.

Nature of Urban Agriculture

The nature of urban agriculture is discussed under the following sub-headings, namely, the land tenure status of farmers, the sizes of farmland, types of crops cultivated, the purpose of cultivation and market areas for sale of produce.

Land tenure status of farmers

The cultivation of crops by farmers is carried out on different plots within the different areas in the Municipality. However, some of these plots are sometimes owned or rented by farmers. The results of respondents' farm tenure status are presented on Figure 7.

Results on Figure 7, reveal that majority (82.28%) of the sampled respondents are tenant farmers with a greater proportion of them (44.3%) being female while 37.97% male farmers. Only, 17.72% of the urban farmers own the plots on which they cultivate. In this category, majority of land owners (15.19%) were male farmers while females represented a mere 2.53%. This therefore reveals a disparity in landholding between men and women farmers in the area and stands as an index of disparity of profitability from the activity. Land owners cultivate and make more profits than those renting plots to cultivate as the owners do not have to pay rents.

Size of Farmland

The farmlands on which various crops are cultivated vary in sizes as summarised on Figure 8.

Figure 8 reveals that urban farm sizes are generally small but vary greatly especially between their areas of location that is either in the outskirts of the town or in the inner core. As many as 50% of the urban farmers cultivate land areas below 0.5ha with a balance repartition between males (25%) and females (25%). 36.25% of the farmers had farm sizes of 0.5 ha to 0.9 ha, with more being male farmers (22.50%) and fewer female farmers (13.75%). This survey established that the largest urban farm sizes were 1- 1.5ha and only 13.75% of the farmers owned such plot sizes. Women (7.5%) dominated this category urban farmers than the men (6.25%). It was indicated that the labour in the urban farms comes from hired labourers (40%), family members (30%), and the farmer only (30%).

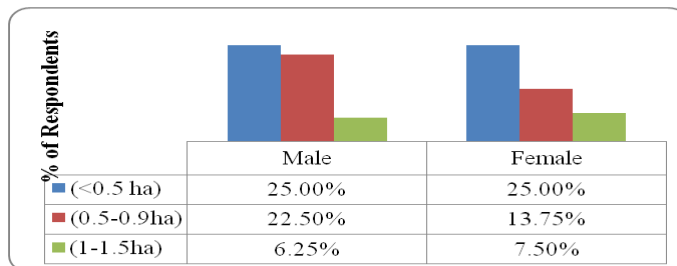


Figure 8: Sizes of Urban Farms
Source: Fieldwork

Types of Crops cultivated

The urban agriculture cornucopia is very rich with almost all categories of food crops produced. There are however given different degrees of importance. The main

urban farms produce vegetables, maize, cassava and animal protein from poultry farms and piggeries. Figure 9 shows a number of food crops cultivated in the Buea Municipality.



Figure 9: Common Urban Agriculture Farms and Produce foodstuff
Source: Field work

The field observations and analysis of questionnaires revealed that these crops illustrated and others are valued differently in the urban farm productivity. They

were rated by the urban farmers in this order- tomatoes (60%), Maize (55%), cassava (45%), groundnuts (40%), yams (35%), Pepper (20%), “egusi” (14%). cucumber

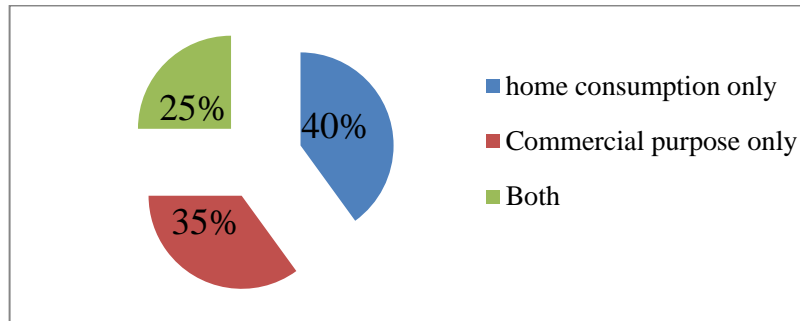


Figure 10: Reasons for farming in Buea Urban
Source: Fieldwork

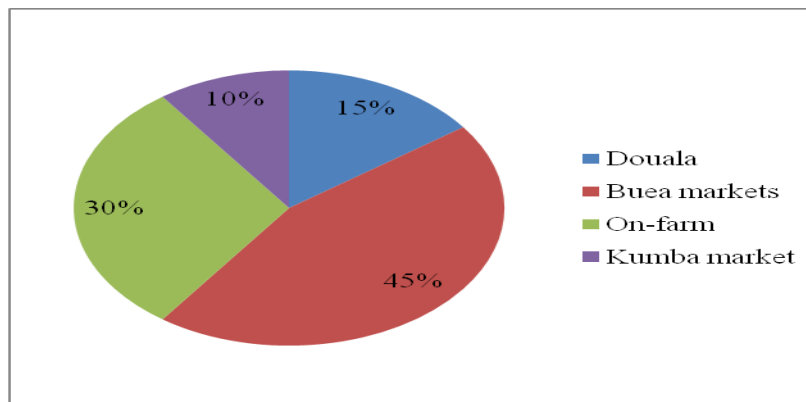


Figure 11: Market areas for farm produce
Source: Fieldwork

(11%), plantain (10%), beans and (10%). Increasingly, farms for the production of protein as chicken and pork have joined the list of food items of urban agriculture.

Purpose of Cultivation

Urban farmers advanced several reasons for their involvement in the activity. These are summarised on Figure 10. Figure 10 reveals that urban agriculture is largely for subsistence as up to 40% of farmers sampled were of the opinion that they were cultivating for home consumption. The 35% who farmed for commercial purposes still sell but to urbanites thereby contributing to enhance urban food security. Some farmers' produce was solely for commercial purposes in different market areas as shown on Figure 11 with some of the farmers selling their produce in the Buea Municipality and beyond. Crops from the urban farms are sold in a number of markets, but mainly Buea (45%) with bulk (45%) of those selling produce. Other important markets are nearby urban centres of Douala (15%) and Kumba (10%) in this order of preference. A significant proportion of the farmers (30%) practice on-farm sales. In Buea, these produce are sold at highly accessible road junctions in Molyko area such as Checkpoint and UB Junction. One such market is shown on Figure 12.

The facts on urban agriculture reveal that it contributes significantly to food supply in Buea, thereby guaranteeing urban food security. Urban agriculture significantly

contributes to health and nutrition by providing fresh produce to lower-income families. This conclusion corroborates that of many other studies. Binns, and Lynch, (1998) exposed that in Dar-es-Salaam and Tanzania, urban farms provide 90% of the city's leafy food in the 1990s and 60% of its milk (16% intra, 44% peri-urban areas). Furthermore, urban agriculture is assumed to create opportunity cost as domestic producers can either save income, via the consumption of home-produced foodstuffs that are cheaper to produce than to buy from the market, and/or increase income by selling or trading their products. As such, higher cash income is positively linked to food security as households are believed to have greater access to food products, both in terms of quantity and quality (Crush, Hovorka and Tevera, 2011; Cofie, Van and Dreschel, 2003). Most people within urban areas farm to supplement their diet and save food expenses, but many, especially urban livestock keepers, also sell part of their production, such as milk and eggs, which provides a secondary source of income (Frayne Bruce *et al.*, 2010; Zezza, A and Tasciotti, L 2010). Binns and Nei (2015) on assessing the significance of urban agriculture in food security and sustainable livelihoods in response to economic restructuring in Zambia's Copper Belt Province, found out that urban agriculture accounted for between 20% and 60% of household income in Africa and they noted that urban agriculture can account for nearly half of all vegetables and other food crops (such as maize) that are



Figure 12: Market for Urban Agriculture Produce in Buea
Source: Fieldwork (2023)

consumed in the city. It therefore plays a key role in supplementing the food budget and often serves as a source of income as part of livelihood diversification. Urban agriculture therefore, remains a key strategy and activity that supports urban populations and contributes in providing food for the growing urban population today. However, despite its contribution to urban food supply

stability, the activity faces challenges.

Challenges of Urban Agriculture in Buea

Up to 60% of the urban farmers confirmed that they face challenges in their farming activity. The challenges faced by farmers within the urban area are summarised in Figure 13

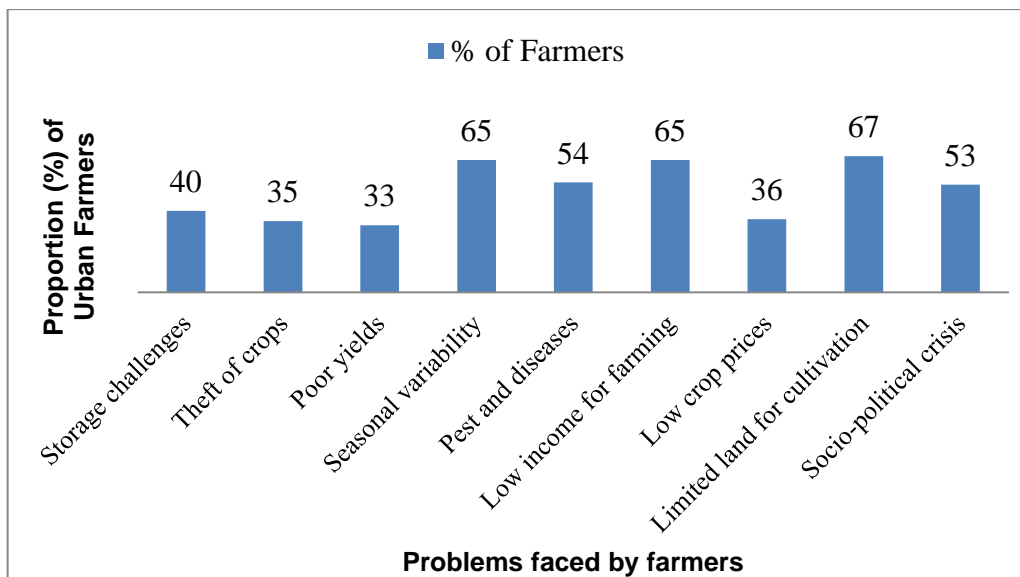


Figure 13: Challenges faced by Urban Farmers
Source: Fieldwork, 2020

Results (Figure 13) revealed that farmers face a myriad of challenges in their activity. 67% noted that there is limited land for cultivation, 65% face financial challenges attributed to low income for farming; 65% pointed to seasonal variability in climatic parameters as a major setback to farming operations and productivity; 54% blamed the proliferation of pests and diseases; 53%

added that the ongoing socio-political crises is a major challenge to farmers. 40% faced storage problems and as there are high records of post-harvest spoilage accounted for by lack of storage facilities especially the perishable market gardening crops. The above findings on climate variability and change as a challenge to urban agricultural crop produce conforms to

those of Chakraborty *et al.*, (2000) cited in Tripathi and Mishra, (2017), Ruel Marie T. *et al.*, (2000) and Ackerman, F., & Stanton, E. A. (2013), who opined that climate change affects agriculture in two ways, namely, directly and indirectly. Changes in climatic factors (for example, temperature, and rainfall) affect agricultural productivity through physiological changes in crops and other factors of production such as water availability, soil fertility, and pests. The results are also in line with those of Tunde (2011), Defang *et al.*, (2014), UN Women (2015), Sounders *et al.*, (2017) who confirmed that climate change hits hard on farmers within the Buea and Muyuka municipalities as seen through decline in yields and increase prevalence of pests and diseases. Our results also conform to those of Mulenga (1995), who expressed that land tenure problems and theft constitute negative factors to urban agriculture and food security. Rogerson (2000), noted that political instability and economic crisis have been considered as other setback factors negatively affecting urban agriculture as well as compromising urban household food security.

Limited lands for expansion constitute another problem for urban food security. In Dar-es-Salaam most farmers use land through informal agreements or completely without agreement. In Nampula city (Mozambique), over 40% of families borrow land from relatives, sometimes with payment in kind. Tenure security lasts only until the harvest is completed, after which the owner can reclaim the land if he needs it for other purposes. Other families cultivate unused public or private land without permission and often without knowing to whom it belongs, risking being evicted from it at any moment with no compensation (Mulenga, 1995).

CONCLUSION

The study admits that there is a diversity that exist in urban agriculture and that it contributes positively to household's food security levels to a very great extent. The study further reveals that urban farmers are faced with a myriad of challenges as well as households with regards to accessing adequate food and on issues of availability of food. This growing urban activity in Buea Municipality holds a key to achieving Sustainable Goal 2 (SDG2) which aims to end hunger ,achieve food security and improved nutrition and promote sustainable agriculture. The target should be to ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, maintain ecosystems, strengthen capacity for adaptation as postulated by Guodaar *et al.* (2016). The current agricultural extension and intensification should target disaster risk preparedness and management to increase food security. Government must also look at the development of weather services for better and accurate weather information that farmers could use in their

decision-making climate variability is posing a negative effect on agriculture at all scales.

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COMPETING INTERESTS

I the lead and corresponding author declare on our collective honour that no competing interests exist.

AUTHORS' CONTRIBUTIONS

Authors 1 and 2 conceptualised the work and designed the research instruments and drilled author 3 on how to proceed with the administering of the questionnaires. Author 3 drafted the first manuscripts into a long essay which was restructured into article format by author 2. Author 1 then finalised the article by putting editing, proof-reading it and more importantly streamlining it with the template of International journal of innovation scientific research and review (IJISR).

REFERENCES

- Ackerman F, Stanton EA (2013). *Climate Impacts on Agriculture: A Challenge to Complacency?* Global Development and Environment Institute, Working Paper No. 13-01, Tufts University pp. 1-17
- Asongwe GA, Yerima BPK, Tening AS (2014). Vegetable Production and the Livelihood of Farmers in Bamenda Municipality, Cameroon. *Int. J. Curr. Microbiol. App. Sci.* 2014, 3, 682–700
- Binns T, Lynch K (1998). Feeding Africa's Growing Cities into the 21st Century: The Potential of Urban Agriculture, *Journal of International Development*, Vol 10, 777-793
- Binns JA, Nei E (2015). The Significance of Urban Agriculture in Food Security and Sustainable Livelihoods in Response to Economic Restructuring in Zambia's Copper Belt Province, *Global Education Programme International Development Research*
- Chakraborty *et al.*, (2000). Climate change: Potential impact on plant disease. Environmental Pollution.108(3):317-26. DOI:10.1016/S0269-7491(99)00210-9
- Cofie OO, Van Veenhuizen R, Dreschsel P (2003). Contribution of Urban and Peri- Urban Agriculture to Food Security in sub-Saharan, Ruaf Paper Presentation

- at the 3rdWWF in Kyoto
- Corbould C (2013). Feeding the Cities: Is urban Agriculture the Future of Food Security? *Future Directions International*, www.futuredirections.org.au/publication/feeding-the-cities-is-urban-agriculture-the-future-of-food-security/
- Crush J, Havorka, AamdTevera D (2011). Food Security in Southern African Cities: The Place of Urban Agriculture, *Progress in Development Studies*, Vol. 11., No.4, Pp. 285-305
- Defang NJ, Manu I, Bime MJ, Tabi OF, Defang HF (2014). *Impact of Climate Change on Crop Production and Development of Muyuka Subdivision, Cameroon*. *International Journal of Agriculture, Forestry and Fisheries*. Vol. 2, No. 2, 2014, pp. 40-45, <http://www.openscienceonline.com/journal/ijaff>
- Edward C (2002). Trade and Food Security: Conceptualising the Linkages, Oversea Development Institute, Rome, 11-12 July www.fao.org/3/y4671e/y4671e06.htm
- FAO (2002). The State of Food Insecurity in the World 2001, Rome
- FAO (2010). Fight Poverty and Hunger: What Role for Urban Agriculture, Policy Brief, No. 10,
- FAO (2020). Food for the Cities, Urban and Peri-urban Forestry in Africa, the Outlook for Wood fuel, www.fao.org/urban-agriculture/en/
- Frayne Bruce et al. (2010). "The State of Urban Food Insecurity in Southern Africa." Urban Food Security Series No. 2. Queen's University and AFSUN: Kingston and Cape Town.
- Guodaar L, Beni A, Asante F, Eshun G, Adjei PO (2016). *Analysing the Determinants of Adaptation Practices to Climate Variability among Tomato Farmers in the Offinso North District, Ghana*, *International Journal of Innovative Research & Development*, Vol. 5, Issue 12, Pp. 169-177
- Inter-governmental Panel on Climate Change (2001). *Climate Change 2001: Impacts, Adaptation and Vulnerability*. A Report of the Working Group 2 of the Intergovernmental Panel on Climate Change, Schneider, S. and Sarukhan, J. (Eds). Cambridge University Press, Cambridge, United Kingdom and New York.
- Inter-governmental Panel on Climate Change (2007a): *Climate Change: The Physical Science Basis*. Contribution of Working Group 1 to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, United Kingdom and New York.
- Intergovernmental Panel on Climate Change (2014): *Climate change 2014: synthesis report*. Contribution of Working Groups I, II and III to the fifth assessment report of the Intergovernmental Panel on Climate Change, 151 (2014). New York.
- Lee Smith D, Prain G (2010). Urban agriculture in Africa: What has been learned? In: Prain, G.; Karanja, N.; Lee-Smith, D. (eds.). *African urban harvest: Agriculture in the cities of Cameroon, Kenya and Uganda*. New York (USA). Springer; IDRC; CIP. ISBN 978-1-4419-6571-4. pp. 13-35.
- Mougeot LJA (2000). "Achieving Urban Food and Nutrition Security in the Developing World: The hidden significance of Urban Agriculture". Washington: International Food Policy Research Centre
- Mulenga Mark C (1995). Peri-Urban Agriculture: A Case of Small Scale Peasant Cultivation in and around Zambian Towns and Cities with Special Reference to Lusaka. *Eastern and Southern Africa Geographical Journal* Vol. 6, Issue 1, December, Pp 1-16
- Olunmi Balogun (2011). Sustainable Agriculture and Food Crisis in Sub-Sahara Africa. In book: *Global Food Insecurity* (pp.283-297). Babcock University. DOI:10.1007/978-94-007-0890-7_20
- Parry Martin L, Rosenzweig Cynthia (1994). Potential impact of climate change on world food supply. *Nature*, 367 (1994), p. 6459
- Rogerson Christian M (2000). "Coping with Vulnerability in Africa: Urban Agriculture and Poverty Alleviation". *Africa Insight*, Vol. 30, Issue 3-4, PP66-72.
- Ruel Marie T. et.al, (2000) "Urban Challenges to Food and Nutrition Security: A Review of Food Security, Health and Care Giving in the Cities", IFPRI Discussion Paper 51.
- Sounders BN, Tata ES, Mojoko FM (2017). *Effects of Rainfall and Temperature Oscillation on Maize Yields in Buea Sub-Division, Cameroon*, *Journal of Agricultural Science*; Vol. 9, No. 2; 2017, Pp. 63-72, Canadian Centre of Science and Education.
- Srivastava, T.K., Singh, K P and Yadav, R. L. (2012). Sugarcane productivity, soil health and nitrogen use dynamics in as bio-nutrition based multi-ratooning system under Indian sub-tropics. *International Sugar Journal* 114: 584-589.
- Stewart R, Korth M, Langer L, Rafferty S, Da Silva N, van Rooyen C (2013). What are the impacts of urban agriculture programs on food security in low and middle-income countries? *Environ Evidence* 2(7):1-13
- Tripathi Amarnath, Mishra Ashok K (2017). Knowledge and passive adaptation to climate change: An example from Indian farmers *Climate Risk Management*. Volume 16, 2017, Pages 195-207. Elsevier
- Tunde AM (2011). Perception of Climate Variability on Agriculture and Food Security by Men and Women Farmers in Idanre L.G.A, Ondo State- Nigeria, *Ethiopian Journal of Environmental Studies and Management*, Vol. 4., No.2, Pp. 19-32
- UmoAnagho Roland (2020). "Urban Agriculture and Challenges to Household Food Security in Buea Municipality, Southwest Region of Cameroon". Unpublished Bsc. Long Essay, Department of Geography, Faculty of Social and Management Sciences of the University of Buea, Cameroon.

- UN Women (2015): Climate Change, Gender and Food Security in the Pacific, UN Women Fiji Multi-Country, Level 3, Kadavu House Victoria Parade Suva, Fijiasiapacific.unwomen.org
www.facebook.com/unwomenpacific
- UN-Habitat (2010). State of the World's Cities 2010/2011: Bridging the Urban Divide. United Nations Human Settlements Programme (UN-HABITAT), Nairobi-Kenya. Earthscan, London.
- UNICEF (2023). The State of Food Security and Nutrition 2023. Urbanization, agrifood systems ,transformation and healthy diets across the rural urban continuum. UNICEF DATA. 12 July, 2023
- United Nations (2022). Food Security and Nutrition in the World. The State of Repurposing Food and Agricultural Policies to Make Healthy Diets More Affordable. FAO, UNICEF, UNIFAD, WFP, WHO, Rome.
- Wen P, Elliot MB (2019). Then concept of Food Security. In Ferranti, P., Berry, E.M., Anderson, J.R (Eds), Encyclopedia of Food Security and Sustainability, Volume 2, Pages. 1-7, Elsevier
- World Bank (2011). (Saswati Bora, Iride Ceccacci, Christopher Delgado, and Robert Townsend). World Development Report 2011, Background Paper. Food Security and Conflict. Agriculture and Rural Development Department, World Bank, October 22, 2010.
- Zeza A, Tasciotti L (2010). Urban Agriculture, Poverty and Food Security, *Food Policy*, Vol. 35, No. 4, Pp. 265-27