



Case Study

Opportunities of Urban Horticulture for Poverty Alleviation in Dar es Salaam city, Tanzania – A Case study of Ubungo Municipality

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Abstract

The study was conducted to explore the opportunities of the urban agriculture focusing on vegetables and ornamental flowers production towards poverty reduction and alleviation in Dar es Salaam city as a case study of Ubungo Municipality. A non-random (availability) and purposive sampling methods were used to select 240 smallholder farmers and 16 local government officers as crucial informants respectively. The data were collected by using observation, questionnaires, interviews and documentary reviews. The collected data were coded and analyzed by using the SPSS. The study revealed that production of urban vegetables and ornamental flowers has a significant positive contribution towards the increase in availability and accessibility of food security, nutrients and income generation for the improvement of essential social services such as water, electricity, health, and education. It is recommended that the government and other stakeholders should recognize and provide more support to this sector for sustainable development.

Keywords: Agriculture, smallholder farmers, vegetables, ornamental flowers, production

Introduction

Poverty is one among the significant developmental problems facing the world (Lucci, Bhatkal and Khan, 2017). According to the WHO Millennium Development Goals Report 2015 (WHO, 2015), about 800 million people still live in extreme poverty and suffer from hunger. It is estimated that over 836 million people live on less than \$1.0 per day and more than 1 billion people cannot meet the basic needs. The overwhelming majority of the people living on less than \$1.25 a day reside in Sub-Saharan Africa and Southern Asia regions- and they account for about 80% (WHO, 2015). Half of the extremely poor live in Sub-Saharan Africa where about 389 million people survive on less than \$1 per day (The World Bank, 2016) and 239 million people suffer from hunger (Fanzo, 2012).

In Tanzania, the situation is terrible, as about 47% of the Tanzanians live on less than \$1.90 per day with approximately 12 million people living in the extreme poverty on earning of less than \$0.60 per day (Dokken and Angelsen, 2015). According to the Household Budget Survey of 2014 (URT, 2014), the incidence of the basic needs poverty was 28.2%, and the food poverty was 9.7% in 2012, lower than targeted 12.5% by 2015. Indicators of income poverty show disproportions between rural and urban areas, as well as across and with regions and districts. The urban Basic Need Poverty and food poverty constitute about 25.9% and 9.7% to 33.3% and 11.3% in rural areas (URT, 2014).

Currently, urban inhabitants in Tanzania are pursuing a wide range of economic activities to address the poverty problem. Taking into contemplation that, life in the urban areas has become more expensive while the employment

opportunities in the formal sectors have gone down and the received wages do not keep up with the commodities' price increases. Based on this fact, some urban occupants have opted for urban agriculture (Smart, Nel and Binns, 2015). Dar es Salaam like other cities in Africa has been facing some problems associated with poverty. Food insecurity, inadequate housing, inadequate access to clean and safe water, and unemployment are some problems facing the inhabitants (Schmidt, 2011).

Urban agriculture involves the growing of vegetables, fruits and ornamental flowers and trees in the town or cities (Dieleman, 2017). Urban agriculture like other sectors plays a social, economic and environmental role in many cities globally (Robineau and Dugué, 2017). According to Golden (2013) and Rezai et al. (2016) urban agriculture expands significantly as an adaptive response by urban dwellers to improve their livelihoods through; 1. health benefits such as food access and security, increased fruit and vegetable consumption, food and health literacy and general well-being. 2. Social benefits such as the creation of safe places, education and youth development opportunities and access to land. 3. Economic benefits such as job creation, training and market expansion for farmers, economic savings on food and increased home values.

In general urban agriculture is considered as part of alternative food networks (Kontothanasis, 2017) and it contributes plentiful to the sustainability of the food needs of the cities thus to urban sustainability. Furthermore, it provides the solution of the environmental sustainability through greening the cities (Birkved *et al.*, 2016). Since rapid urbanization pushes low-income families to the margins due to inadequate housing, hunger and a shortage of clean water,

vegetable and ornamental flowers growing has become a survival strategy for the urban poor who lack the skills to secure well-paid jobs (Kiduanga and Shomari, 2014).

Although urban agriculture plays a vital role in socio-economic development, it has not been given attention as a catalyst for urban development and as an essential way for poverty alleviation strategy. Despite the fact that quite a lot of research works on urban agriculture have been conducted, including Schmidt (2011), Golden, (2013) Smart et al. (2015), Birkved et al. (2016) Rezai et al. (2016) Kontothanasis, (2017), scarcely of the cited studies attempts to provide empirical evidence related to contribution of the urban agriculture to the poverty alleviation. This study, therefore, intended to fill the recognized gap, by exploring the contribution of urban agriculture focusing on vegetables and ornamental flowers related yield production using Ubungo Municipality as a case study. It furthermore, explicitly aimed at identifying types and quantity of vegetables grown in the study area and examine the contribution of the urban vegetation production to poverty alleviation.

Research Methodology

Sample Size and Selection of Wards and Respondents

Four wards in Ubungo Municipality were selected for questionnaires and interviewing smallholder farmers. These were Kimara, Sinza, Mazense and Ubungo. The process of selecting them involved the municipality planning and agricultural officers who were consulted to list wards in which their inhabitants are actively engaged in urban agriculture. Thus, the selection of the four wards for the study was made purposively based on the engagement in the urban agriculture. A sample of 240 smallholder farmers was selected. 60 from each ward. A non-random (availability) sampling method was used in the selection of the smallholder farmers since there was no sampling frame for smallholder farmers that could facilitate the use of simple random sampling. Thus, all smallholder farmers who were found in their areas during the research and agreed to participate in this research became part of the sample. Apart from the smallholder farmers, the sample also included 16 local government officials namely One municipal Planning Officer, one Municipal Agricultural Officer, one Local Environment Officer, one Municipal Development Officer, four Ward Executives, four Ward Extension Officers and four Ward Development Officers. They acted as key informants who provided necessary information concerning the accessibility of land for urban agriculture. Purposive or judgement sampling tools was used to select the officers who were familiar with the study.

Data Collection Methods

Primary Data Collection Methods

Interview and Questionnaire

The mixed questionnaires and interviews were conducted with the 240 smallholder farmers in the selected wards. Semi-structured interviews with the help of an interview guide with 16 different local government officers were conducted.

Observations

The observations were done in each area visited to

supplement the information collected during interviews. Observations concentrated on the ways smallholder farmers conduct their activities, the type of crops grown and growing techniques such as planting and harvesting.

Secondary data collection methods

Secondary data were collected through documentary review whereby some documents were reviewed, including research reports, government policies published and unpublished works. Electronic data were also accessed and collected from different websites.

Data Analysis

The quantitative data were coded, entered and processed using the computer program namely the Statistical Package for Social Science (SPSS), version 19.0. Analysis of the data was prepared through simple statistical methods such as percentages, tables, and ratios. The qualitative data were analyzed through a thematic analysis. This method involved the reading, reorganizing, categorizing and coding the data to get themes ready for interpretation and presentation.

Results and Discussion

Characteristics of the respondents involved in the study

The study in Table 1 revealed that the majority of the smallholder farmers growing vegetables and ornamental flowers are young people aged between 18 and 37 with 58%. This implies that energetic people are participating in the urban agriculture. Furthermore, the study found that the production seemed to be dominated by the female with 67.9%. The production is dominated by those who have education ranging from informal to secondary education. These constitute 88.3% of all respondents as shown in Table 1. It is unfortunate that the level of participation in the production sector by those with high levels of education is low. The main reasons for the minimal participation are that most of the people with high levels of education are employed in the non-farming activities in socio-economic and political sectors in private or government agencies. However, some who involve in this sector mostly employ casual laborers to perform most of the farming works.

Table 1: Description of the respondents involved in the study (n=240)

Demographic characteristics	Frequency	Per cent (%)
Sex		
Male	77	32.1
Female	163	67.9
Total	240	100
Age (in years)		
18 – 27	64	26.7
28 – 37	75	31.3
38 – 47	55	22.9
48 – 57	32	13.3
58 and above	14	5.8
Total	240	98.1
Level of education		
Informal education	30	12.5
Primary education	107	44.5
Secondary education	75	31.3
Higher education/college	28	11.7
Total	240	100

Source: A Field Survey, 2017

Table 2: Estimated quantity of vegetable crops produced in kilogram (kg)

No.	Type of vegetable and ornamental flowers	2012	2013	2014	2015	2016	Total
1.	Amaranth	5,033	5,776	6,111	6,500	7,512	30,932
2.	Pumpkin	7,800	9,550	9,998	11,020	11,579	49,947
3.	Chinese Cabbage	4,540	5,750	5,991	6,352	7,975	30,608
4.	Spinach	579	631	673	751	796	3,430
5.	Pepper	1,151	1,250	1,375	1,750	1,811	7,337
6.	Tomatoes	6,720	7,100	7,550	7,600	7,965	36,935
7.	Salad	2,450	2,785	3,050	3,405	3,784	15,474
8.	Okra	490	575	750	870	955	3,640
9.	Legumes leaves	14,050	16,800	17,505	18,500	18,955	85,810
10.	Ornamental flowers	nil	nil	nil	nil	nil	nil

Source: A Field Survey, 2017

Table 3: Monthly estimated income in Tanzanian Shillings (Tshs) generated before and after participation in vegetable and ornamental flowers production

	Estimated income	Minimum	Maximum	Mean
Generated before participating in vegetable and ornamental flowers production		90,000	350,000	220,000
Generated after participating in vegetable and ornamental flowers production		150,000	1,300,000	725,000
Increased income after participation in vegetable and ornamental flowers production		60,000	950,000	505,000

Source: A Field Survey, 2017

Types and Quantity of Vegetables and ornamental flowers

Types of vegetables and flowers that are grown by smallholder farmers in the study area

Varieties of vegetables yields and ornamental flowers are grown in the study area. Amaranth, pumpkin and Chinese cabbage are the dominant vegetables grown during wet and dry seasons. Other types include spinach, pepper, tomato, salad, okra, legume leaves such as pea and cassava leaves and collard greens are very popular in the study area. The ornamental flowers that are grown in the study area include roses, windflowers (*Anemonenemorosa*), apple blossom, freesia, gardenia, ghost flowers, royal palms, Christmas palms, American palms, ferns, cacti, primrose, freesia and gardenia.

The study revealed that the cultivation of such kinds of vegetables and ornamental flowers are due to the following reasons:- market accessibility and availability, availability of affordable inputs and financial resources. Other respondents mentioned that they grow varieties which are favorable to climatic conditions and resistance to the diseases and pests, and short growth cycle of some varieties were the reasons for their cultivation. Cultivation takes place mostly in open places including the road reserves for the ornamental flowers. The planting and harvesting are done at the rotating based type. For example, it can take 20 to 30 days from the planting of amaranths to harvesting. Farmers apply simple tools such as spades, hand hoes, rakes, water pumps and bush knives. Some few smallholder farmers can possess and use advanced equipment such as water pumps for irrigation. Production activities are labor intensive where the farmers themselves or family members involve actively. Few smallholder farmers employ casual laborers to perform some or most of the gardening activities.

Quantity of vegetable crops and ornamental flowers produced by smallholder farmers

The average quantities of vegetables and ornamental flowers that are grown by the smallholder farmers in the study area are presented in Table 2. The data are estimated in kilogram per year for each sampled variety of the vegetable products. The estimate for ornamental flowers was difficult because no measurements were taken for the flowers

produced. The increased trend is due to the factors such as the increase of the productivity by the smallholder farmers, the increase of market regarding the high consumers due to the population growth in the city and reasonable price of the products. Furthermore, there is an increase of available agricultural input like working tools, fertilizers (manure), seeds and workforce. Legume leaves such as pea, potato leaves (85,810 kg) are produced at the largest quantity compared to others. Followed by pumpkin (49,947 kg) tomatoes (36,935 kg), amaranth (30,932 kg) and Chinese cabbage (30,608 kg).

The Impact of Vegetables and Ornamental flowers Production to Poverty Alleviation

Poverty is determined by different dimensions which include household income, household living standards, access to basic needs (welfare provisions), benefits from the state and tax systems (Brandful, Erdiaw-kwasie, and Amoateng, 2015; Ngo, 2017). This study aimed to explore how the urban agriculture contributes to poverty alleviation. Two poverty dimensions namely household income and access to the essential social services that are food security, health, water supply and education were examined. The detailed information on each aspect is explained below.

The impact of vegetables and ornamental flowers production on the households' income

Income generated by the household usually determines the purchasing and accessibility capacity of the household to meet basic social needs and services such as food, shelter, clothing, education, health and water supply. The results in Table 3, revealed that income generated per month increased after the participation in the vegetables and ornamental flowers production. The average generated income after the participation in the vegetables and ornamental flowers production increased to Tshs.725,000 per month from Tshs. 220,000 before participation in the production.

These findings, therefore, indicate that urban vegetables and ornamental flowers production has a significant positive impact towards the increase of the households' income. This probably is very important for improvement of the households' livelihoods.

Table 4: The impact of urban vegetable and ornamental flowers production on food accessibility and availability

Variable	Responses			
	Increased		Remained the same	
	N	%	N	%
Food accessibility	177	73.7	63	26.3
Food availability	169	70.4	71	29.6

Source: A Field Survey, 2017

Table 5: The impact of urban vegetables and ornamental flowers production on basic social services such as water supply, electricity, health and education

Variable	After engagement in the urban vegetables and ornamental flowers production							
	Increased		Not Changed		Decreased		Total	
	N	%	N	%	N	%	N	%
Ability to pay the bills of water services	205	85.4	27	11.3	8	3.3	240	100
Ability to pay the bills of electricity	191	79.6	45	18.7	4	1.7	240	100
<i>Health services</i>								
Ability to access medical services and facilities	186	77.5	49	20.4	5	2.1	240	100
Ability to meet health consultation	158	65.8	73	30.4	9	3.8	240	100
<i>Education services</i>								
Ability to buy school equipments	179	74.6	59	24.6	2	0.8	240	100
Ability to pay school tuition fees and extra studies	183	76.3	56	23.3	1	0.4	240	100

Source: A Field Survey, 2017

The impact of vegetable production on food security

Food security is the ability of the people to have physical and socioeconomic access to sufficient, safe and nutritious food that encounter their dietary necessities and food preferences for an active and healthy life at all the times (Anderson *et al.*, 2017). It constitutes accessibility, availability, utilization, and stability. The core focus of the study was on accessibility and availability within the households engaging in the urban vegetable and ornamental flowers production. Vegetable products are among the food varieties produced to feed the community. They have different nutrients such as vitamin A and C, calcium, fiber, folate (folic acid), magnesium, sodium and potassium for the human bodies (Storey and Anderson, 2017).

The study in Table 4, show that majority of the smallholder farmers (73.7% and 70.4%) reported that there is an increase of the accessibility and availability of food respectively, at the household level after participating in the urban vegetable and ornamental flowers production compared to the period before the participation.

The impact of urban vegetables and ornamental flowers production on essential social services such as water supply, electricity, health and education

Urban agriculture not only produces food for the household but also is a strategy to increase income for the accessibility of basic social needs such as education, health and water supply. It determines the changes likely to happen at the household level regarding the improvement of the livelihoods. On this part, the concern was to scrutinize the contribution of income earned from urban vegetation and ornamental flowers production on the household ability to pay bills for water and electricity and access health and education services.

The impact of urban vegetables and ornamental flowers production on households' accessibility of water and electricity services

The findings in Table 5, show that 85.4% of the respondents reported that their ability to pay the bills of

water services increased after involvement in the urban agriculture while 11.3% reported that ability has not changed. 79.6% of the respondents reported that the ability to pay bills of electricity increased while 18.7% reported the unchanged status after engagement in the urban agriculture. These findings, therefore suggest that urban vegetable and ornamental flowers production has a significant positive contribution towards poverty reduction regarding accessibility of water and electricity services.

The impact of urban vegetables and ornamental flowers production on households' accessibility of health services

The respondents were asked to indicate the impact of production of urban vegetable and ornamental flowers on health services. The special concern was dedicated to finding out the impact of income earned from the urban agriculture on households' ability to meet medical costs and consultation. The results in Table 5, show that 77.5% of the respondents reported the increased ability to access medical services and facilities such as drugs and mosquito nets for malaria prevention. 65.8% reported the increase of the ability to meet health consultation in the health centers such as dispensaries and hospitals. These findings, therefore, imply that urban vegetation and ornamental flowers production has a significant contribution towards the improvement of individual and households' health services.

The impact of urban vegetable and ornamental flowers production on households' accessibility of education services

Apart from water, electricity and health services, the concern of the study was to examine the contribution of the income generated from the urban agriculture on the household ability to access education services. The primary concern was on buying the school equipment such as school uniforms, pens, exercise books, books and payment of tuition fees and extra studies charges. The results in Table 5, indicated that 74.6% and 76.3% of the respondents reported the increase of their ability to buy schools equipment and

pay tuition fees and extra charges respectively after engagement in the production of the vegetable and ornamental flowers. These findings, therefore, reveal that urban vegetable and ornamental flowers production has a significant contribution towards reducing poverty in terms of increasing the accessibility of smallholder farmers to education services.

Furthermore, under this study, the respondents pointed out that the production of urban vegetable and ornamental flowers has been challenged. They mentioned the shortage of land for cultivation, the informality of the sector, low financial resources for purchasing agricultural inputs as the main challenges towards the production rate.

Conclusion and recommendations

Through this study, it is clear that urban agriculture plays a significant role towards reducing and alleviating the poverty among the inhabitants of Dar es Salaam city. The households' income has risen after engagement in the urban vegetable and ornamental flowers production. This has facilitated the increase of availability and accessibility of the essential social services such as water, electricity, health, and education. The government and other stakeholders are recommended to assist in formalizing the sector and provide incentives such as land, agricultural extension services, loans and subsidy to the agricultural inputs to the smallholder farmers.

References

- Anderson, E., Jalles D'Orey, M. A., Duvendack, M. and Esposito, L. (2017). Does Government Spending Affect Income Inequality? a Meta-Regression Analysis. *Journal of Economic Surveys*, 103, 60–71.
- Birkved, M., Goldstein, B., Hauschild, M. and Fern, J. (2016). Testing the environmental performance of urban agriculture as a food supply in northern climates', *Journal of Cleaner Production*, 135, 984–994.
- Brandful, P., Erdiaw-kwasie, M. O. and Amoateng, P. (2015). Rethinking sustainable development within the framework of poverty and urbanisation in developing countries. *Environmental Development Journal*, 13, 18–32.
- Dieleman, H. (2017). Urban agriculture in Mexico City; balancing between ecological, economic, social and symbolic value. *Journal of Cleaner Production*, 163, S156–S163.
- Dokken, T. and Angelsen, A. (2015). Forest reliance across poverty groups in Tanzania. *Ecological Economics*. 117, 203–211.
- Fanzo, J. (2012). *The Nutrition Challenge in Sub-Saharan Africa, UNDP - Regional Bureau for Africa - Working Paper*.
- Golden, S. (2013). Urban Agriculture Impacts: Social, Health, and Economic: A Literature Review. *UC Sustainable Agriculture Research and Education Program*, November, pp. 1–22.
- Kiduanga, J. and Shomari, A. (2014). Urban Agriculture : Critical Issues Of Land Administration for Expansion of the Farming Of Vegetables in Dar es Salaam. *Journal of the Geographical Association of Tanzania*, 36(1), 115–134.
- Kontothanasis, G. (2017). Social practices of urban agriculture in the metropolitan region of Thessaloniki. *Procedia Environmental Sciences*, 38, 666–673.
- Lucci, P., Bhatkal, T. and Khan, A. (2017). Are we underestimating urban poverty?', *World Development*, 103, 297–310.
- Ngo, D. K. L. (2017). A theory-based living standards index for measuring poverty in developing countries. *Journal of Development Economics*. 130, 190–202.
- Rezai, G., Shamsudin, M. N. and Mohamed, Z. (2016). Urban Agriculture: A Way Forward to Food and Nutrition Security in Malaysia. *Procedia - Social and Behavioral Sciences*. 216, 39–45.
- Robineau, O. and Dugué, P. (2017). Landscape and Urban Planning A socio-geographical approach to the diversity of urban agriculture in a West African city. *Landscape and Urban Planning*, 170, 48–58.
- Schmidt, S. (2011). Urban Agriculture in Dar es Salaam, Tanzania. *Food Policy for Developing countries*, 7–12, 10.
- Smart, J., Nel, E. and Binns, T. (2015). Economic crisis and food security in Africa: Exploring the significance of urban agriculture in Zambia's Copperbelt province. *Geoforum*. 65, 37–45.
- Storey, M. and Anderson, P. (2017). Total fruit and vegetable consumption increases among consumers of frozen fruit and vegetables. *Nutrition*, 46, 115–121.
- The World Bank. (2016). *Poverty Overview*. Available at: <http://www.worldbank.org/en/topic/poverty/overview> (Accessed: 4 December 2017).
- URT. (2014). *Household Budget Survey Main Report, 2011/12, Tanzania Mainland*. Dar es Salaam.
- WHO. (2015). *The Millennium Development Goals Report 2015*.