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The Role of Gender in Supporting Livelihoods through Urban and Peri-Urban Agriculture: The Case of Kinondoni Municipality in Dar es Salaam City, Tanzania

Dissertation

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Submitted by

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DECLARATIONS

Declaration of own work

I, Christina Kifunda (matriculation number 4385917) hereby declare that this dissertation titled "*The Role of Gender in Supporting Livelihoods through Urban and Peri-Urban Agriculture: The Case of Kinondoni Municipality in Dar es Salaam City, Tanzania*" is my own original work and that it has not been presented and will not be presented to any other university for similar or any other degree award. All sources cited or quoted in this dissertation are indicated and acknowledged with a comprehensive list of references.

Declaration of Good Academic Practice

I declare that I have followed the guidance of good academic practice of the Carl von Ossietzky University Oldenburg (17.03.2017).

Oldenburg, 9th December 2019

Christina Kifunda

ABSTRACT

Urban and peri-urban agriculture (UPA) is a common informal sector activity across many Sub-Saharan African cities that acts as a mechanism for coping with food insecurity and the alleviation of poverty. This study assessed the role of gender in supporting livelihoods through UPA in the Kinondoni municipality, in the city of Dar es salaam, Tanzania. The motivation for this study lies in the fact that many urban dwellers depend on UPA for their survival, yet the roles of men and women are still not clearly established. The study also looked at the extent of men's and women's participation in UPA, and how their roles are described in the study area. The factors influencing men and women of different age groups to participate in UPA and the strategies for improving agriculture were dealt with in this study. A mixed-method approach was adopted, and data were collected through semi-structured interviews, questionnaires, focus-group discussions and direct observations. A total of 386 respondents engaged in urban and peri-urban agriculture, 5 ward extension officers, 5 local market traders and 2 district agricultural officers were interviewed in the Kinondoni Municipality. People's perceptions and knowledge on UPA in relation to livelihoods were captured through content analysis. Quantitative data analysis was conducted using the Statistical Package for Social Sciences (SPSS) version 26. The relative risk (RR) concept was employed in assessing gender differences in involvement in agricultural activities, while the association between gender and sustainable livelihood was assessed using logistic regression models. The findings of the study show that more women than men are participating in UPA. The study also revealed that other activities, in which males were significantly more often involved than females, include land preparation, fertilizer application, and weeding and pest control, while most of female hired labour for land preparation. For both men and women, the most influential factors that motivated them to participate in UPA include; lack of employment, a means to earn an income, a means to get food, a means to alleviate poverty, their low level of education, the availability of market for their products, a means to get fresh food and the availability of open spaces and undeveloped plots. With regards to socio-economic development of the people, UPA appears to provide the needed capability sets (opportunities) important for sustaining peoples livelihoods. These capability sets observed in this study are: physical health, financial capital, education, food security and social

relations. The study further revealed that key challenges that are facing UPA include; pests and diseases, land access and availability, and climate change. The adaptation strategies suggested by farmers for the improvement of UPA are: the use of quality inputs, capital availability, adequate education, improved markets and technology for sustainable livelihoods. The study recommends that the government should recognize the importance of UPA through the improvement of water services, the provision of subsidies and low-interest loans, and also the inclusion of urban and peri-urban agriculture in city- and urban planning. Also, farmers should be equipped with necessary education through training, seminars, and workshops related to UPA. For these recommendations to be practical farmers need to have solidarity by forming and joining to farmer groups for easy access of various services like financial services, trainings and the share of production costs.

ZUSAMMENFASSUNG

Urbane und peri-urbane Landwirtschaft ist in vielen Städten des südlichen Afrikas eine verbreitete informelle Aktivität, welche als Bewältigungsmechanismus gegen Ernährungsunsicherheit und Armutsbekämpfung dient. In dieser Studie wird die Rolle der unterschiedlichen Geschlechter bei der Schaffung oder Erhaltung von Lebensgrundlagen durch UPA untersucht. Die Motivation für diese Studie resultiert aus der Tatsache, dass viele Bewohnerinnen und Bewohner in Städten für ihr Überleben auf UPA angewiesen sind, wobei die Rolle von Männern und Frauen noch nicht klar definiert ist. Die Studie untersucht auch das Ausmaß der Beteiligung von Männern und Frauen in der UPA und wie ihre Rollen im Untersuchungsgebiet beschrieben werden. Die Einflussfaktoren für die Teilnahme von Männern und Frauen unterschiedlicher Altersgruppen an UPA und Strategien zur Verbesserung der Landwirtschaft wurden in dieser Studie behandelt. Es wurde ein Mixed-Methods Forschungsansatz gewählt und die Daten wurden durch semi-strukturierte Interviews, Fragebögen, Fokusgruppen-Diskussionen und direkte Beobachtungen erhoben. Insgesamt 386 Befragte, die UPA praktizieren, fünf Bezirksvorstehende auf Ward-Ebene, fünf lokale Markthändler und zwei Bezirksagrarbeamte auf Distrikt-Ebene wurden in der Gemeinde Kinondoni befragt. Die Wahrnehmungen und das Wissen der Menschen über die UPA in Bezug auf Ihre Lebensgrundlagen wurden durch Inhaltsanalysen erfasst. Die quantitative Datenanalyse wurde mit Hilfe des Statistischen Programms für Sozialwissenschaften (SPSS Version 26) durchgeführt. Das Relative Risiko (RR)-Konzept wurde verwendet, um geschlechtsspezifische Unterschiede in der Beteiligung landwirtschaftlicher Aktivitäten zu bewerten, während der Zusammenhang zwischen Geschlecht und einer nachhaltigen Lebensgrundlage mit Hilfe logistischer Regressionsmodellen bewertet wurde. Die Ergebnisse der Studie zeigen, dass sich mehr Frauen als Männer an UPA beteiligten. Die Studie ergab des Weiteren, dass andere Aktivitäten, wie die Landvorbereitung, die Düngung sowie die Unkraut- und Schädlingsbekämpfung signifikant häufiger von Männern durchgeführt werden als von Frauen, während die meisten Landwirtinnen Arbeitskräfte für die Landvorbereitung einstellen. Beschäftigung, Einkommen, Ernährungssicherheit, Armutsbekämpfung, frische Lebensmittel, Flächenverfügbarkeit, Bildungsniveau und

Marktverfügbarkeit werden als einflussreiche Faktoren für die Beteiligung von Männern und Frauen an UPA identifiziert. Die Verbesserung der Ernährungssicherheit, eine verbesserte Gesundheit, Siedlungen und soziale Beziehungen sowie die Verfügbarkeit der Grundbedürfnisse in den Haushalten gehörten zum sozioökonomischen Beitrag der UPA als Lebensgrundlage der Menschen. Schädlinge und Krankheiten, Landverfügbarkeit und -zugang sowie der Klimawandel sind die größten Herausforderungen für die UPA im Untersuchungsgebiet. Die von den Landwirten vorgeschlagenen Anpassungsstrategien zur Verbesserung der UPA betrafen die Nutzung hochwertiger Inputs, Kapital und Bildung, verbesserte Märkte und Technologien für nachhaltige Lebensgrundlagen. Die Studie empfiehlt die staatliche Anerkennung der UPA durch die Verbesserung der Wasserversorgung, die Bereitstellung von Subventionen, vorteilhafte Darlehenskonditionen und die Einbeziehung der UPA in den Städten und die Stadtplanung. Außerdem sollten die Landwirte mit der notwendigen Bildung durch Schulungen, Seminare und Workshops im Zusammenhang mit der UPA ausgestattet werden. Damit diese Empfehlungen praktikabel sind, müssen sich die Landwirte untereinander zusammenschließen und ihre Stimme gegenüber den zuständigen Behörden erheben.

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LIST OF ABBREVIATIONS AND ACRONYMS

AOR	Adjusted Odds Ratio
CI	Confidence Intervals
CO2	Carbon Dioxide
ECOSOLA	Ecosystem Based Solutions for Resilient Urban Agriculture
EUNEC	European Network of Education Councils
FAO	Food and Agricultural Organization of the United Nations
FGD	Focus Group Discussions
GHG	Greenhouse Gases
GIS	Geographical Information Systems
ICO	International Coffee Organization
ICDD	The International Center for Development and Decent Work
IPCC	The Intergovernmental Panel on Climate Change
IFPRI	International Food Policy Research Institute
ITC	International Trade Canter
MARC	Malolo Agricultural Resource Center
NAPAs	National Adaptation Programmes of Action
OR	Odds Ratio
RUAF	Resource Centre on Urban Agriculture and Food Security
SSA	Sub-Saharan Africa
SPSS	Statistical Packages for Social Sciences
START	Global Change System for Analysis, Research and Training
TBC	Tanzanian Broadcasting Corporation
TMA	Tanzania Meteorological Agency
RR	Relative Risk
UNAPCAEM	United Nations Asian and Pacific Centre for Agricultural Engineering and Machinery
UNFCCC	United Nations Framework Convention on Climate Change
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPA	Urban and Peri-urban Agriculture
URT	United Republic of Tanzania

CHAPTER ONE

1.1 Introduction

This chapter gives an overview of the study of the gender contribution in sustaining livelihoods through UPA. It contains the background of the study, the statement of the research problem, the objectives of the study, as well as its significance. The last section in this chapter describes the organization of the thesis.

1.2 Background to the study

The population of many cities in Sub-Saharan Africa is growing very fast as a result of increased birth rates, decreased mortality rates and rapid, rural-urban migration (UN-Habitat, 2007). Current studies show that urbanization is transforming the world as more than 50 percent of the world population lives in urban areas. It is estimated that the world urban population will increase up to 75 percent in 2050 (Miccoli et al., 2016; Saghir and Santoro, 2018). Rapid migration from rural areas to urban centres is the result of rural disturbances such as poverty, land degradation, climate change, and famine (Odhiambo, 2009). Adverse changes in climate are leading in pushing people out of rural areas because of reduced agricultural productivity (Barrios et al., 2006). Most people move into urban areas seeking for economic opportunities and means to improve their livelihoods. As a result, many cities in many developing countries are facing common challenges such as food shortages, unemployment and sometimes deterioration of the environment. The problems arose because city populations are growing with little or no significant plans for socio-economic development (Hsieh, 2014).

Urbanization processes in many Sub-Saharan African countries are often associated with gender-related transformations, such as the greater participation of women in paid employment, linked to a wider range of opportunities than in rural areas (Evans, 2014). Nonetheless, women are not benefiting equally to men in urban areas, as gender inequalities are still experienced in many areas of everyday life. Access to decent work opportunities, increased workloads from the double burden of earning income

and family care work and accessing financial assets and housing security are some of the inequalities experienced by women in urban areas (Reichlin and Shaw, 2012; Tacoli, 2012; Tacoli and Satterthwait, 2013; Reichlin and Shaw, 2015; Chant and McIlwaine, 2016; Moser, 2016).The urbanization process is also accompanied by the high level of economic decline and inequality, which lead to food insecurity and unemployment, especially in and around the major urban centres (Mougeot, 2005; UN-Habitat, 2007; Mkwambisi et al., 2010). Life in urban areas in African countries has become more expensive, while employment in the formal sector has declined, and real wages are not enough to cover all expenses. Many urban households are facing a serious decline in their purchasing power. People have to find different ways to respond to the situation, most notably by diversifying their income sources which has stagnated because of various factors, including climate change-related challenges (African Studies Centre, 2006).

UPA is one of the ways to improve food security of urban households and to diversify their livelihood options under conditions of persistent economic uncertainty and threats of climate change (Njogu, 2007; Havaligi, 2009; Redwood, 2009). It is obvious that the urban poor could benefit from farming in town because the start-up investment for farming is relatively low for urban residents. UPA can be used to reduce urban poverty across Sub-Saharan Africa (Mougeot, 2000; Baker, 2008; Mudzengerere, 2014). In many cities, however, it is more difficult for the urban poor to acquire access to the land needed for urban and peri-urban agriculture than for rich people (Lovell, 2010; Schmidt, 2011).

Gender is an important aspect in UPA, since socio-economic roles in the community are basically attributed to people based on their gender and age (Folke et al., 2005). The roles of men and women in supporting livelihoods differ within the household, and these differences vary widely by region, age, ethnicity, and social structure, as well as with cultural and economic conditions (Danso et al., 2003; FAO, 2011). In order to succeed in any productive activity, gender roles are supposed to be considered in designing and implementing the production objectives (Bouis et al., 2013). In many African counties, both men and women are responsible for satisfying the needs of their households, but it

is also tradition that women have a greater responsibility in a household than men. Both men and women farm, but their participation is clearly differentiated by the location of the field, production system, and scale of the area involved (Obuobie et al., 2004; Robertson, 2013). The issue of gender is complex and dynamic, mostly depending on socio-cultural contexts that can change over time (Danso et al., 2003). This study focuses on assessing socio-economic contribution of UPA on the livelihoods of farmers and people within and around the city of Dar es Salaam. The study also analyses the drivers for gender participation in UPA and how farmers can be assisted in improving UPA in the Kinondoni municipality of the city of Dar es Salaam.

1.3 Statement of the Problem

Gender issues in agricultural production are an important subject of investigation, to see how men and women participate in economic development. It has been revealed by Danso et al. (2003) that in African societies, women are under-nourished, under-educated, overworked, underpaid and hence poorer than their male counterparts. There is no gender equality in many African societies. Women are heavily committed to many household activities, like reproductive roles such as nurturing and caring for children, and productive roles such as farming and trading, or are formally employed. To a large extent, gender inequality and discrimination reduce, destroy and sometimes freeze a woman's ability to do various things in life, including work, travel and participate in social, cultural, and political activities (Abebe, 2014; Osman, 2016). Such discriminatory practices limit women's freedom to do what they want to do, as they are subject to the imposed gender-discriminating constraints (Robeyns 2005; Abadeer, 2015).

In Tanzania, gender inequalities continue to be maintained by the cultural systems, customs and traditions that discriminate against women (Wilbers, 2003; Abebe, 2014). In most Tanzanian societies, men are dominant, and women are subordinate in that men hold the power in all the important institutions of society, and women are disadvantaged regarding access to such power. The cultural systems favour men having power of ownership and control over resources such as land, and women are powerless and have no or fewer

ownership rights.

Gender analysis in UPA thus seems essential for policy formulation and programme planning towards gender equality between men and women UPA farmers. Many studies on UPA has been done in the city of Dar es Salaam focusing on different aspects. For example, the study conducted by Schmidt (2012) focused on policy and urban agriculture; Mashashua et al. (2009) focused on the potential of urban agriculture for poverty reduction while Malekela (2019) focused on UPA contribution to food security. There is limited information on gender roles in UPA and their contribution in sustaining livelihoods. Taking into consideration that the growth of many cities in Africa is associated with the challenges of food insecurity, unemployment and climate change induced effects in which the most affected groups are women and children. Therefore, this study aimed at generating data that will contribute to a better understanding of gender roles in UPA and the degree of their contribution to a sustainable livelihoods. The investigation of the driving factors for men and women of different age groups to participate in UPA were assessed in this study. It addresses key areas of attention for policy makers to better integrate gender equality and agriculture in order to formulate recommendations for appropriate policies which will support the development of UPA for sustainable livelihoods in the city.

1.4 Objectives of the study

1.4.1 General objective

The overall objective of this study was to assess the role of men and women in supporting livelihoods through urban and peri-urban agriculture (UPA).

1.4.2 Specific objectives

Specifically, the study intended to: -

i. Examine the extent of men and women participation in UPA and how their roles are described in the study area.
ii. To determine the influential factors for men and women of different age groups to participate in UPA in Kinondoni municipality.

iii. To examine the socio-economic contribution of UPA due to different roles of men and women in the study area.
iv. To capture strategies suggested by farmers to improve UPA in the study area.

1.5 Research questions

The study was guided by the following research questions

i. To what extent are men and women involved in UPA and how have their roles been described in the Kinondoni municipality?
ii. What are the factors determining the participation of men and women of different age groups in UPA in the city?
iii. What are the socio-economic contributions of UPA with respect to different roles of men and women in the study area?
iv. What can be done to empower UPA farmers for the improvement of agriculture in the study area?

1.6 Significance of the study

The study is of great significance as it was expected to contribute important knowledge on gender participation in UPA and the obtained capability sets which enable farmers to choose the kind of life they value. The study has established the role of gender in UPA in the study area and revealed the association between gender and sustainable livelihoods. The information obtained in this study could be used to discover a good way of empowering farmers (men and women) to improve UPA for sustainable livelihoods.

This study will also guide policy makers in planning and designing policies that recognise the importance of women's roles in UPA for sustainable livelihoods. The rapid population increase leads to the increased demand of food and unemployment problem; the study could play a significant role in guiding policy makers to design and plan for the policies that recognize the contribution of UPA towards sustainable livelihoods in the city.

However, the study has increased the knowledge on the possible strategies adopted by farmers to overcome various challenges facing UPA particularly the

impacts of climate change. The study is therefore, expected to stimulate more studies on gender roles in relation to UPA and motivate other people to explore more on how UPA could be improved to make farmers live the exact life they wished to live.

1.7 Organisation of the thesis

The thesis is organised into eight chapters. Chapter one describes the background information; introduction of the study, the statement of the research problem, objectives of the study and the significance of the study.

Chapter two reviews the relevant literature and establishes the theoretical and conceptual framework. The research methodology adopted by this study is presented in chapter three. That chapter presents the description of the study area, the sampling and its procedures, as well as the methods used for data collection. The ethical considerations adhered to during data collection and the data analysis and the presentation plan are described in the last part of chapter three.

The findings of the study and the discussion are presented in chapters four to seven. The findings are presented by considering the four research questions of the study. Chapter four presents and discusses the extent of men's and women's participation in UPA, starting by describing the demographic characteristics of the respondents and UPA practices in the study area.

The influencing factors for men and women of different age groups to participate in UPA in the city are identified and discussed in chapter five. Chapter six describes the socio-economic contribution of UPA in the study area. Challenges and strategies to improve UPA in the study area are outlined in chapter seven. Chapter eight covers the summary, conclusions and the resulting recommendations.

CHAPTER TWO

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Introduction

This chapter presents the reviews of literature related to urbanization in Sub-Saharan Africa (SSA); UPA practices and its contribution to livelihoods, challenges facing UPA in SSA cities, and gender participation in UPA. Furthermore, the chapter gives highlight on the existing knowledge gaps that this study tries to address. The last part of this chapter presents the theoretical and conceptual framework that provides guidance to this study.

2.2 Urbanization in Sub-Saharan Africa

Urbanization processes are reconstructing the world. Sub-Saharan Africa (SSA) is urbanizing in the fastest rate (Saghir and Santoro, 2018). The growth of cities due to rural-urban migration and natural increase (fertility) represents one of the most transformative forces shaping SSA today. Many residents in SSA urban centres live in the settlements which are unmapped and lack legal addresses. People are living in poor-quality and overcrowded housing that lacks access to the infrastructure and services that urban centres need. The areas are not well equipped with important services such as water supplies, sanitation and health care (Satterthwaite, 2013; Satterthwaite, 2015). Thus, the areas are not able to mitigate the impact of various risks, like the threats that arise from, or are exacerbated by, the impacts of climate change (Hedrick-Wong and Angelopulo, 2011). If there are no clear preparations, plan or implementation of policies, rapid urbanization will reduce the quality of life and increase poverty in urban areas.

The urbanization process in SSA is associated with the challenges of food insecurity, poverty and unemployment (Besthorn, 2013; UN, 2014). One of the responses to overcome the problem of food insecurity and unemployment in SSA cities is the establishment of UPA (Bon et al., 2010; Zezza and Tasciotti, 2010; Liangyan, 2012). UPA has become a component of most of the urban areas in SSA, as food is produced in and around the cities, which has become an integral part of the urban system (Cofie et al., 2003; Gallaher at al., 2013).

Dramatic population increases in urban areas underline the extension of UPA, as a way of overcoming food insecurity and unemployment problems in cities (Brown, 2002; Cofie, 2005; Baseka, 2016).

In Tanzania, a rapid urbanization is taking place, especially in the city of Dar es Salaam (URT, 2014). Dar es Salaam is the fastest-growing city in Tanzania. The city of Dar es Salaam has a population of 4,368,541 people, equal to 10% of Tanzania's population (URT, 2012). Its growth rate is 5.6%, which translates to 250,000 additional people per year (URT, 2012). This rapid growth is paralleled by an increasing demand for employment and the availability of food supplies (Baseka, 2016). This study therefore aimed at assessing the role of gender in contributing to the sustainable livelihoods in the city of Dar es Salaam through UPA.

2.3 Urban and Peri-urban Agriculture

Urban and peri-urban agriculture (UPA) has been defined by several authors as the cultivation of crops and rearing of animals within the perimeters and open spaces of the urban center and its urban periphery (Mouget, 2005; FAO, 2007; Baker, 2008; Zezza and Tasciotti, 2010; Sebata et al., 2014). In this study therefore, UPA is defined as the cultivation of crops and rearing of animals for food and other uses within and outside the boundaries of the city. UPA has been identified to be an important practice that plays a significant role in improving the socio-economic status of people in cities by providing employment, by raising their incomes and by providing their household's with fresh and nutritious food (Njogu, 2007; Havaligi, 2009; Redwood, 2009; FAO, 2011).

In many studies UPA has been perceived as a means of improving people's livelihoods, food security and as an important strategy for poverty alleviation in the cities (Chambers and Conway, 1992; Nugent, 2000; Gamhewage et al., 2015; World Bank and FAO, 2008; RUAF, 2011; START, 2011b; Olawepo, 2012; Bouis et al., 2013; Mudzengerere, 2014). Much of the literature shows that, for various reasons the major being food security and income generation, women are dominating in UPA (Danso et al., 2003; Wilbers, 2003; FAO, 2007;

FAO, 2011; Simiyu, 2012; Adedayo and Tunde, 2013; Robertson, 2013). Urban and peri-urban agriculture is a dynamic concept that comprises a variety of livelihood systems, ranging from subsistence production and processing to more commercialized agriculture (Mlozi et al., 2014).

UPA takes place in different locations with different socio-economic conditions and different political regimes. The diversity of UPA is one of its main attributes, as it can be adapted to a wide range of urban situations and to the needs of diverse stakeholders. It includes food products from different types of crops and animals. Often, the more perishable and relatively high-valued vegetables and animal products and by-products are favoured. Production units in UPA tend in general to be more specialized than rural enterprises, and exchanges take place across production units (Brown, 2002).

However, UPA is a large and growing industry that uses urban waste water and urban solid waste as inputs, which closes ecological loops when processed on idle land and water bodies. UPA improves the quality of the urban environment through greening and a reduction in pollution (Reese, 2014).

2.4 Socio-economic and ecological contribution of UPA

UPA is estimated to involve 800 million urban residents worldwide in income-earning and food-producing activities. UPA is a spontaneous response to the increased demand of food linked to the rapid urban population increase, which is more pronounced in developing countries due to high birth rates and rural-urban mmigration (FAO, 2011; Githugunyi, 2014). Formal employment in SSA is decreasing, and informal activities have become a necessary strategy for survival. Lack of formal employment opportunities, as well as the growing demand for food has stimulated the development of UPA in SSA cities (FAO, 2007). UPA motivates men and women to go beyond subsistence farming and engage in related activities such as small-scale food processing and marketing, or more profitable UPA microenterprises (Wilbers et al., 2004).

UPA generates additional income from sales of surpluses and money saved on food expenditures, which can then be used for other developmental purposes (Githugunyi, 2014). UPA is an important strategy for poverty alleviation in

African cities, as it helps farmers to have a decent livelihood. It enables UPA farmers to produce additional food and other products for consumption and for sale (Cofie et al., 2003; Odhiambo, 2009). Moreover, UPA plays a tremendous role in sustaining food security in many African urban centers. It plays an important role in enhancing urban food security, since the costs of supplying and distributing food to urban areas based on rural production is very high, and the food thus available does not satisfy the demand of the urban population (Cofie et al., 2003; Simeon, 2008; Wooten and Amy, 2011). To a large extent, UPA complements rural agriculture and increases the efficiency of the national food system, as it provides food products that cannot easily be supplied by rural agriculture, like perishable products that require rapid delivery to the market after harvesting (FAO, 2007). Food production in the city is, in many cases, a response to a survival strategy of the urban poor, as they lack purchasing power for food. This is because most cities in developing countries are not able to generate better income opportunities for the rapidly growing population (Wilbers et al., 2004).

In addition, UPA is an important part of the urban ecological system and can play a substantial role in the urban environmental management system. A growing city will produce more and more waste water and organic wastes. For most cities, the disposal of wastes has become a serious problem. UPA can help to solve such problems by using organic materials for humus production and by providing ecological services (Brown, 2002). UPA may also play a positive role of greening and cleaning the city, by turning degraded open spaces into green zones and maintaining buffer and reserve zones free of housing.

Another positive impact of UPA to the environment is that of regulating the city climate through shade and the sequestration of CO2 (UNAPCAEM, 2012). Growing food with sustainable methods, specifically organic farming, reduces the use of chemical fertilizers and pesticides, traps carbon dioxide in the soil, and also composts organic wastes that reduces methane emissions from landfills (Cofie et al., 2003). However, poor practice of UPA might cause health problems, through contamination of crops with pathogenic organisms as a result of irrigation with water from polluted streams. Also, UPA might lead to

environmental degradation through the use of industrial chemicals and fertilizers that contaminate soil and water (Fritsche et al., 2015).

2.5 Gender participation in UPA in SSA cities

Robertson (2013) defines gender roles as “the assigned activities and relative position in society of men and women that delineate access to opportunities and resources as based on local cultural perceptions of masculinity and femininity”. Gender has also been defined as the socio-cultural construction of roles and relationships between men and women (Wilbers et al., 2004). Traditions, religion, age, marital status, ideologies, societal perceptions, as well as cultural and economic conditions influence gender relations in the society (FAO, 2011). In this study, gender is defined as the socially constructed characteristics such as roles and responsibilities of men and women that are created in our families, societies and cultures (UNESCO, 2003).

Gender differences in agriculture exist in the access to, and control over, land resources and the use of land in farming activities. For example, women use their land primarily for subsistence crops to feed their families, while men cultivate cash crops and keep the income (Adedayo and Tunde, 2013). Kutiwa et al. (2010) showed that women participate more actively in UPA than men, since their daily household activities go hand in hand with UPA activities. A study conducted by Wilbers (2003) shows that urban immigrants transfer their traditional division of labour to the urban areas, which put more responsibilities on the shoulders of women.

However, both men and women play a significant role in the development of the economy, even though they are not benefiting equally. In Tanzania, women are more active in agricultural activities, specifically in food production and processing, than men. Also, women engage more in domestic labour, which is little acknowledged, praised, or prefered by men. Men dominate in manufacturing, construction, transport, and finance activities, which pay them more than women (Ellis et al., 2007).

The study by Robeyns (2002) used the capability approach, which was developed by Amartya Sen to measure equality, notably using welfare and

resources to describe gender inequality in Western societies. It revealed that in many aspects, women are more disadvantaged than men. It suggested a list of capability sets in achieving gender equality in any society. In agriculture, gender inequality is revealed in various aspects of life, such as access to, and control over, land resources for production, as well as the division of labour at the household level, especially in farming activities (Danso et al., 2003).

Gender roles are learnt, they change over time, and vary widely within and across cultures (UNESCO, 2003; Dugbazah, 2012). Because gender is culturally constructed, a diversity of cultural values merges in urban areas, such that traditional definitions of gender roles, responsibilities, characteristics, and behaviour are not necessarily appropriate, and often change. Thus, compared with rural contexts, there are potential differences in political, economic, and social factors in urban settings. Compared to men and women living in rural areas, urban men and women have greater access to services and infrastructure, more opportunities to engage in paid employment, and enjoy a relaxation of socio-cultural restrictions (Reichlin and Shaw, 2015).

The urbanization process reconstructs gender roles, because many women seeking urban residence have reduced their desire to have husbands, and some men are continuously escaping their role of breadwinner (Onyango, 2017). Also, formal qualifications from the education system have led to changes in gender roles, since educated men and women usually opt for formal employment in the cities, rather than participating in agricultural activities. Whereas both men and women are employed, the number of employed women now exceeds the number of employed men in some parts of the African continent, for example in the Zambian copper belt (Evans, 2014).

Looking back on the traditional way of life, we see that the role of women is the most varied and changed. Traditionally, women were taken as helpmates and mothers, while men's role was to work and support the family financially, but not engaging on the everyday aspect's child rearing. This is because women naturally bear children and nurture them until they reach maturity. While women nurture the children, men go out and gather resources to provide for the family. Urbanization has changed the roles of today's women, as they have moved

into every area of social and economic life. Nowadays, more women participate in paid employment than before, although there are differences between countries (Heintz, 2010; World Bank, 2011). Women in urban areas have a greater chance of having paid work than in the rural areas. For urban women, paid work implies not only income earning, but also independence from men and the opportunity for self-advancement (Pozarny, 2006; Tacoli, 2012; Tacoli and Satterthwaite, 2013). Women from rural areas are moving into urban areas to seek paid jobs, either in the formal or the informal sectors. If they fail to find the jobs they were expecting, they end up farming, i.e. doing the work they were doing when they were in rural areas.

In UPA, men and women conduct farming activities in different ways. Male farmers usually work in land preparation, because it is energy draining manual work which most women are not able to do themselves instead, they employ men to work for them (Robertson, 2013). Most women in UPA water and apply fertilizers on their farms (Danso et al., 2003). In urban centers, market sellers, who subsequently sell directly to consumers or sell to other market sellers, mainly also do the harvesting of farm products on the farm.

2.6 Challenges Facing UPA in SSA Cities

Although UPA brings many benefits to urban people, there are many challenges facing the farmers who participate in UPA. Those challenges are absence of a clear policy guiding UPA, capital access and availability, land problem, and poor technology (Odhiambo, 2009; Erwin, et al., 2018). Due to poor accessibility to capital, many African UPA farmers are facing the challenge of an unreliable supply of inputs such as planting materials, organic fertilizers and agro-chemicals (Olawepo, 2012; Gamhewage et al., 2015).

Moreover, land competition has become the challenging factor for sustainable UPA in cities. Land is scarce and very expensive in urban centers (Githugunyi, 2014). In this case, UPA has to compete with other urban land uses such as residential, commercial and industrial uses, which are often prioritised, because they are more advantageous and profitable to the land owners than UPA (Odhiambo, 2009). UPA requires intensive production methods, because

the available space in cities is very limited. It needs advanced technology to obtain higher outputs from urban and peri-urban agriculture (Odhiambo, 2009). Poor technology constraint UPA, as the farmers use traditional farming methods that do not harmonize with the changing dynamics of production. However, contaminated soil and water used to produce food causes health risks in urban areas, because the plants grown on those areas take up heavy metals or other toxic agents from contaminated soil and water (Lovell, 2010; Fritsche et al., 2015).

In most cases, in developing countries UPA also faces the challenge of disturbance of farms from intruders and animals. The problem affects a majority of UPA farmers whose farms are located close to the city, because most of the UPA in developing countries is not usually organized. In some countries agriculture is organized by the governments. The organization differ from one county to another country. For example, commercial ranching is organized in countries like Kenya, Tanzania, Ethiopia and Zimbabwe. In a country like Nigeria, however, organized ranches are few, while free-range animal husbandry is common both within and outside the city (Olawepo, 2012).

2.7 Impacts of Climate change on UPA

Climate change is now considered the most serious environmental threat facing humankind, as it affects all aspects of human activity (Boko et al., 2007; Cohen et al., 2017; Agbola, 2011). In urban areas, vulnerability is highly influenced by the extent and quality of infrastructure, public services, economic conditions, and institutional or political factors (Satterthwaite, 2007; Roberts et al., 2011). Climate change is a severe threat to sustainable economic growth and may lead to extended poverty on the African continent, particularly Sub-Saharan Africa. The areas that are highly vulnerable to the impact of climate change are food production, the health sector, biodiversity, rangelands and water resources (Kimani et al., 2013). People can feel the impact of climate change in different ways. For example, shorter rainy seasons and flooding disturb agricultural activities, affecting large numbers of people who rely on the sector to earn a living (Klein, 2015).

Climate change has negative impacts on agriculture in some areas and have positive impacts in others. Increased rainfall intensity increases soil erosion and floods in some areas, whereas other regions are affected by drought due to a decline in rainfall (ITC, 2010; Haggar and Schepp, 2011, 2012). Also, climate change lead to an increase in serious diseases such as malaria, tuberculosis and diarrhoea on the African continent, which stagnate economic development (UNFCCC, 2007). Agriculture is the hardest hit sector in the face of climate change, as it is highly sensitive to alterations in climatic conditions (Hanjra et al., 2013). Global food security threatened by climate change is one of the most important challenges in the 21st century, to supply enough food for the increasing population while sustaining the already stressed environment (Lal, 2009).

In a report to the Committee on World Food Security, the Food and Agricultural Organization of the United Nations stated that climate change reduces the available land for farming in SSA countries and increase the problem of hunger (FAO, 2005). The impact is most severe in SSA, where countries are least able to adapt and to compensate for negative effects through increased food imports. Population growth, as an additional stressor, makes food security a critical challenge in rapidly urbanizing low-income regions of the world, where poverty is increasing, and the urban poor are highly sensitive to rising food prices. Climate change is likely to bring increasing volatility to food prices, which could further intensify urban food insecurity.

Urbanization and climate change are closely linked. The emission of carbon dioxide (CO_2) and other greenhouse gases (GHG) are mainly emitted in urban areas (RUAF, 2014). The impact of climate change in cities ranges from a sea-level rise, floods, droughts and damage to infrastructure, creating an enormous impact on UPA (Grimm et al., 2008; Rosenzweig et al., 2011). Climate change has already affected food-production systems, leading to loss of crops, grain shortages, and increased commodity prices, all of which undermine food security, a fundamental human right (Havaligi, 2009).

Changes in temperature, the amount of carbon dioxide (CO_2), and the frequency and intensity of extreme weather events have significant impacts on

crop yields. Warmer temperatures make many crops in the temperate regions grow more quickly, but in other regions, or depending on crop characteristics, higher temperatures could also reduce yields. For any particular crop, the effect of increased temperature will depend on the crop's optimal temperature for growth and reproduction. In some areas, warming may benefit the types of crops that are typically planted there. However, if warming exceeds a crop's optimum temperature, yields can decline (Hatfield et al., 2014).

Tanzania is among the SSA countries experiencing the impacts of extreme weather events, such as drought and flood, which have a significant impact on both the people and the economy (Oladayo, 2017). Severe droughts are increasingly being felt in many parts of the country, with negative consequences on, among other things, food production and water supplies (Besada and Sewankambo, 2009). Droughts have seriously affected most vulnerable sectors, including agriculture, forestry, fisheries, energy, health, water, industry, business/trade, tourism, and services (Shayo, 2014). Also, climate change has led to the prevalence of crop pest and diseases is also reported to have increased, posing more challenge to agriculture (McDonald and Riha, 2009; Smith, 2015; Baseka, 2016).

Many farmers in Tanzania depend on rain-fed agriculture, and this means their crop production and livestock depend on the weather (Mbilinyi et al., 2013). Devereux and Edwards (2009) and Devereux and Maxwell (2001) reported that countries in East Africa are already among the most food insecure in the world, and climate change and variability will aggravate falling harvests. According to NAPA (2006), agriculture has been identified as the second most vulnerable sector to the impacts of climate change, preceded only by the water sector. Studies by Mlozi et al. (2014) revealed that climate change-induced warmer temperatures, more extreme rainfall, and more prevalent drought and flooding, pose significant challenges for UPA in Dar es Salaam.

Data from the Tanzanian Meteorological Agency provides evidence of significant trends in the Dar es Salaam region. The total annual rainfall has decreased from 1430.9mm in 1986 to 782.9mm in 2016, and the temperature has increased steadily from 20.70°C in 1986 to 23.20°C average monthly

minimum temperature (TMA, 2017). These changes and the variability in the climate affect urban and peri-urban agriculture negatively, which is very important for the people of Dar es Salaam. This sector ranks as Dar es Salaam's second employer and provides the city with a large quantity of food: 354,657 tons in 2004 (Ricci, 2012).

2.8 The Gap

Many studies in African countries focussed on urban and peri-urban agriculture as the means to improve socio-economic development (Simeon, 2008; START, 2011b; Abdalla, 2012; UNAPCAEM, 2012). Most of the studies on gender and urban agriculture have been conducted in countries found in Western and Southern Africa but fewer in the East African countries (Danso et al., 2003; Wilbers, 2003; Obuobie, et al., 2004; Adedayo and Tunde, 2013; Mudzengerere, 2014; Gamhewage et al., 2015). They show the role of gender, particularly of women in urban and peri-urban agriculture. These studies used different approaches to address their research problems; no study used the capability approach to assess gender contribution in supporting livelihoods through UPA, but this study uses it to cover the gap. Also, no study has described the extent of male and female participation by describing their contribution to sustainable livelihoods (Fritsche et al., 2015). In addition, the study filled the gap through establishment of the association between gender and sustainable livelihoods which has not yet been done by other studies.

2.9 The theoretical and conceptual frameworks

In the 1980s, the capability approach was developed by Amartya Sen and Martha Nussbaum to evaluate individual well-being and social welfare. The capability approach is an extensive regulating framework for the evaluation and assessment of individual success and social arrangements, the design of policies, and suggestions about social change in the society (Robeyns, 2005). The basic characteristic of the capability approach is its focus on what people are adequately able to do and to be; that is, on their capabilities. It is based on the idea of focusing on people's ability to achieve the things they value in their life (Nussbaum, 2000; Alkire, 2005; Robeyns, 2005; Clark, 2006; Deneulin and

Shahani, 2010; Abadeer, 2015). The capability approach is a broad, integrative, and multidimensional framework for the assessment, understanding and analysis of individual well-being and social arrangements. It evaluates the well-being of individuals in different societies and cultures, especially those subject to discriminating norms and practices. The applications of the approach cover a wide range of social, economic, and political issues, such as poverty, inequality, cultural constraints, and discrimination (Abadeer, 2015).

The capability approach has been used in various studies on gender roles in the developing countries, e.g., the study by Chen (2003) in India and Bangladesh looked at women's rights to employment. Also, Unterhalter (2003) used this approach to examine gender-based education in South Africa. The current study used the capability approach to assess the roles of gender in UPA in sustaining livelihoods. The approach was chosen because it considers the influence of different social, economic, political, and cultural contexts on individuals' capabilities (Alkire, 2015). It acknowledges that people differ in their capacity to convert goods into valuable achievements, due to personal factors, environmental factors, and social affairs (Alkire, 2015). It proposes that social affairs should be primarily evaluated according to the degree of freedom people have to promote or achieve sustainable livelihoods (Oosterlaken, 2009). Sen emphasized that the quality of life needs to be seen in terms of the capability and freedom people have to make choices, and to be able to perform various activities, such as being able to cope with stress and shocks and being able to respond to negative changes in conditions so as to attain sustainable livelihoods (Sithole, 2008). Therefore, the capability approach has been applied to assess the freedom of men and women who participate in UPA has in sustaining their livelihoods. Participation in UPA considered the influence of various factors, such as institutional, economic, socio-cultural and ecological factors in the city of Dar es Salaam. It analysed the extent to which the contributions differ between men-dominated and women-dominated activities towards sustainable livelihoods.

In order for men and women to benefit from human development, they need in principle to have the freedom to choose what they want to do. The capability

approach tries to explain the idea of people's choice, ability, and opportunity to transform resources for sustainable livelihoods regardless of their gender. Sen argues that our decisions and guidelines should focus on what people are able to do and be, on the quality of their life, and on removing obstacles in their lives, so that they have more freedom to live the kind of life that they can value (Alkire, 2005; Robeyns, 2005). It is a holistic approach emphasizing issues that affect people`s capability sets and their achieved outcomes.

In the capability framework, UPA is treated as a means for men and women to enjoy various outcomes such as income generation, food security, improved health, education and settlement. The capability framework suggests that UPA is an important asset in providing livelihoods and improving the well-being of urban dwellers such as those of Dar es Salaam city. Capability sets refers to the opportunities available for people in order for them to choose the kind of life they want to live. It is, however, very important to remember that there is a concrete relationship between capabilities and outcomes (Robeyns, 2002; 2003; Nussbaum, 2003). In this study, capability sets are opportunities, which determine the choices available to men and women who conduct UPA and thus determine the achievement of sustainable livelihoods. There are many capability sets that can be available for UPA participants, such as financial capital, social relations, education, physical health, gender empowerment, and time autonomy.

The conceptual framework in this study addresses the drivers for gender participation in UPA including institutional, economic, socio-cultural and ecological factors. For men and women to be stimulated to participate in UPA, these factors are supposed to be supportive to them. The factors are expected to provide the needed capability sets for the achievement of sustainable livelihoods such as income, food security, improved social relations, and political participation. The effects of UPA in this study are shown to bring about more sustainable livelihoods in the city of Dar es Salaam.

The study selected the capability approach, as it intends to find out how UPA has equipped the farmers with the necessary capability sets to improve their livelihoods. Evaluating capability sets available to the UPA farmers gives

information about what a person is free to do to achieve a sustainable livelihood. The capability sets and achieved livelihoods are analysed in detail in chapter six.

Since the capability approach is a broad framework, it has been operationalized to fit to this study. The conceptual framework has been developed considering UPA as a good that enables farmers to obtain certain capability sets that they use to achieve some developmental goals in their life. The conceptual framework (figure 1) shows that the relationship between UPA as a good, and the capability sets to achieve a certain kind of life, is influenced by various factors. The institutional factors such as strong political acceptance of UPA may lead to the availability of land, gender empowerment, and education as the needed capability sets to stimulate equal participation of men and women in UPA. The institutional factors are expected to create a conducive environment for the farmers to participate in farming activities with the expectations of having good outputs. To bring development, it is highly important to consider a specific institutional context. Embedding farmers in a suite of institutional supports like providing funding access to farming activities, organizational development, information (extension services), and training to the farmers are critically important to bring development in agricultural activities (Bayissa, 2015).

Additionally, economic factors like capital availability, commodity markets, and access to loans and other financial services are very important catalysts in providing the needed capability sets for sustainable livelihoods. Financial capital influences land access and land availability to men and women who are participating in UPA for more improved livelihoods. On the other hand, people are influenced by their employment status. Shortage of other employment opportunities, which is accompanied by a low level of education, induces many people to participate in UPA (Bishoge et al., 2017).

However, socio-cultural factors such as age, gender, marital status, and level of education may lead to the presence of strong social relations and time autonomy which influence men's and women's participation in UPA for higher quality livelihoods. For example, gender responsibilities are very important in most African societies. Important questions concern gender and UPA, such as

how men perceive UPA, or whether UPA is more important to women who often take the responsibility of day-to-day activities of their households and ensure that everyone in the household is well fed. The women combine their household activities with work on the farms. These things are very important, because they determine the success or failure of UPA in providing the capability sets that would help the farmers to achieve the kind of life they desire.

Ecological factors such as climatic conditions, land availability, and water availability play a vital role in stimulating men's and women's participation in UPA. The presence of reliable rainfall and fertile land make UPA more productive. Unreliable rainfall has resulted in severe shortages of water for domestic, agricultural and industrial use (Mlozi et al., 2014). It was interesting to find out how UPA copes with this environmental factor, which can potentially affect the presence of capability sets, and hence desired livelihoods (Kifunda, 2014). For more improved quality of livelihoods, these factors should provide the required capability sets for equal participation of men and women in UPA. The study explored the extent of the influence of the mentioned factors on male and female participation in UPA and the description of their roles in agriculture.

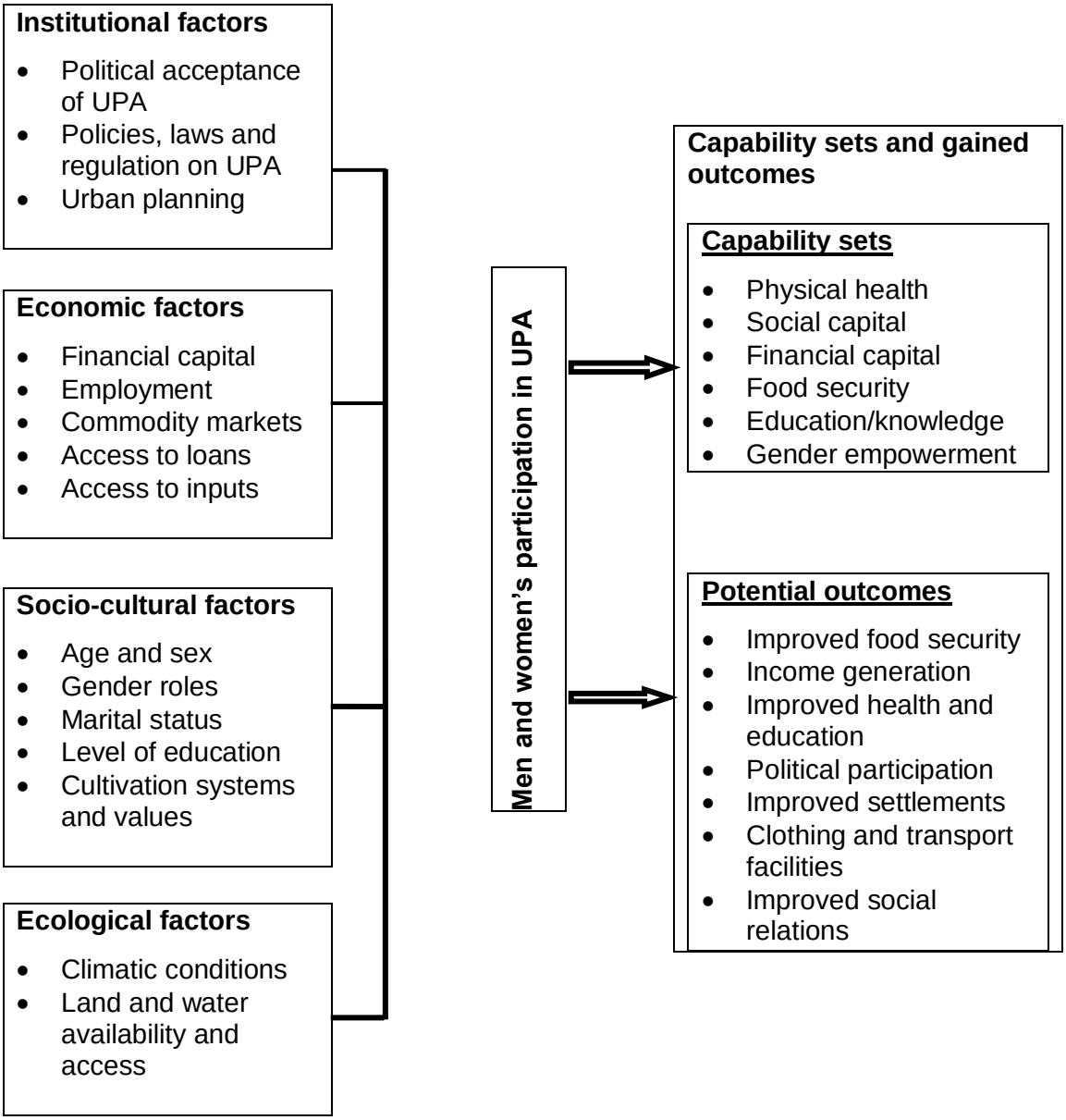

Figure 1: The conceptual frame on gender participation in UPA to sustain livelihoods

Source: Researcher's perspective

Weighing the capability sets available to the farmers gives information about what a person is free to do to achieve a sustainable livelihood. The capability approach is significant in grading, understanding and assessing how farmers benefit politically, economically and socially from participating in UPA. However, the strength of the capability approach is based on enlightening the

informational base of evaluation, by focusing on people as ends. It recognises human heterogeneity and diversity, drawing attention to group disparities (such as those based on gender, race, class or age). The selected capability sets to be used in this study are found in the conceptual framework in figure 1. The capability sets have been discussed regarding their use in sustaining the life of men and women through UPA. One weakness of the capability theory is that it does not specify the capability sets that are to be used. Robeyns (2005) mentioned a need of specification before the approach can be applied. The selected capability sets to be used in this study are briefly discussed below.

2.9.1 Physical health

UPA is expected to equip farmers with physical health to be able to have a good life, which includes both reproductive and productive health. In fact, agriculture is tied to human health at the most basic level. Agriculture produces food and provides livelihoods to millions of farmers, so that they can purchase other necessities of life that contribute to their good health. Moreover, the chain of cause and effect goes both ways. Good health affects agriculture by boosting people's capacity for work and thus increasing how much they can produce (IFPRI, 2006; IFPRI, 2015).

The process of agricultural production and the outputs it produces can contribute to both good and poor health among the farmers as well as the wider population. Agriculture is fundamental for good health through the production of the world's food, fibre and materials for shelter, and, in some systems, medicinal plants (Hawkes and Ruel, 2006). Physical health makes an important contribution to economic progress, as healthy populations live longer, are more productive, and save more.

Farming activities generally involve hard work and long hours. Farmers who are not in good physical health will be unable to achieve the kind of life they desire. The study, therefore, wanted to examine the extent to which gender through UPA improves the physical health of their households and the surrounding community for sustainable livelihoods.

2.9.2 Social capital

According to Robeyns (2003) “social capital”, can also mean social relations which combine two major aspects of the social network and social support. Social network stands for the number of people in a person’s network, the frequency of contact with them, and group membership. The dimension of social support is related to the type and amount of support received. Social capital captures agricultural-related networks, creating access to knowledge and resources and hence promoting a sustainable agriculture for sustainable livelihoods (Rijn and Bulte, 2016). Social capital is essential in helping people recover from the shocks and stresses associated with their vulnerability in their communities. This study described how UPA improve this social relation among the farmers and their community. UPA increases social capital, especially for those households that undertake farming activities in groups (Gallaher et al., 2013).

2.9.3 Financial capital

In a country in which finding formal employment is increasingly becoming very difficult for many ordinary people, the question asked in the current study is whether UPA can contribute significantly to income generation for the farmers. Analysing this capability set shows what kind of choices the farmers could have to sustain their livelihoods. Money is very essential in that it tends to open up choices. If farmers lack an access to credit facilities to be used as capital in establishing farming activities, which has always been a problem for small scale farmers, it can also discourage both men and women from engaging in UPA (Adedayo and Tunde, 2013). The incomes generated from UPA empower the farmers with the ability to acquire land. Land is a very important factor for agricultural activities to take place (Oyegbami and Lawal, 2017).

2.9.4 Food security

Food security is an important capability set, as it helps to understand how UPA contributes to enhancing food security for both farmers and their communities. Since the costs of supplying and distributing food from rural production to urban areas is very high, and do not satisfy the very high demands of the urban

population, it is important to assess its contribution. Farmers need enough and nutritious food to have good health and the ability to work in their farms for more socio-economic gains. Household food security reduces the budget needed to purchase food, provides food for the household, and permits other activities such as investing in small business or buying other household necessities (Armar-Klemesu, 2015). This capability set is thus very relevant and important, because exploring it gives a comprehensive picture on how important UPA is in the Kinondoni municipality.

2.9.5 Education/ knowledge

Knowledge is a rich body of resources for sustainable agriculture. Farming requires skill and technique to be successful. From this capability set it would be interesting to find out whether UPA farmers are acquiring any skills and how they are using these to increase production (Carolan, 2006). On the other hand, the study assessed the contribution of UPA to the education of family members.

2.9.6 Gender empowerment

Gender empowerment and sustainable livelihoods are closely related: in one direction, the struggle for sustainable livelihoods alone can play a major role in driving down inequality between men and women; in the other direction, empowering women may stimulate sustainable livelihoods. Gender disempowerment always affects women's ability to make choices to influence their life chances. Empowerment increases self-reliance and asserts an independent right to make choices and to control resources (Abbott et al., 2015 and Britwum et al., 2018). For the household/community to have sustainable livelihoods, the capability set for gender empowerment is very important.

The capability sets provided by UPA are expected to bring about sustainable/quality livelihoods. The elements of sustainable livelihoods as the gained outcomes include income generation, improved food security, improved social relations, political participation and mobility, improved health, settlements and education. Income is everything in life, as it opens up various choices for persons to choose a certain kind of life. Income generated from UPA helps people to improve their life by obtaining important needs such as

education, health services, shelter and so many important requirements in the household (Sebata et al., 2014; Mhache, 2015).

Also, improved food security is another element of sustainable livelihoods that is analysed in this study. UPA is expected to be very important in contributing to food security, as it provides food for the UPA farmers and the surrounding community; since the food produced could either be used in the household or sold. The money thus obtained makes it possible to buy other types of food they themselves could not produce (Hovorka et al., 2009; Sebata, 2014; Malekela, 2019).

However, UPA is an important agent in improving social relations among UPA farmers and their community where they live. Good social relation is an important factor for growth and development for the developing countries, where sometimes the formal institutions are of low quality (Rijn and Bulte, 2016). Through UPA, farmers can build strong social relationships, which may help them thrive, as they will be able to share many aspects of agriculture. Also, social relation may act as a source of different types of food, as within a social group, people may decide to do barter trade to get food which they are not producing (FAO, 2013).

Improved health is a result of food availability and access in the required amount. Through UPA people get more nutritious food from their farms which improves their health. Also, farmers can pay for health services when they fall sick, using the money obtained through selling UPA products (Doherty, 2015).

The presence of basic needs in the household, such as clothing, improved education, and settlements are expected to be fulfilled through the participation in UPA. UPA farmers eat the food produced on their farms and hence reduce the amount of money required to buy food for the household. As a result, the saved amount of money is diverted to other household basic needs like clothing, transport and education (Smart, 2015; Kinkese and Pride, 2017). There is a direct link between the capability sets provided by UPA and the presence of sustainable/quality livelihoods. The presence of these capability sets influences the sustainability of livelihoods of UPA participants. If farmers

have good health, enough food, good social relations, financial capital and land availability it is obvious that they will engage in farming activities happily, with the hope of getting more profit. If the farmer is able to make enough money and provide for his/her household's basic needs like food, shelter, education, health and transport services this provides a sustainable livelihood. In this study, a sustainable livelihood is defined as the livelihood that comprises the required capability sets provided by UPA as a means of living and which can cope with, and recover from, stresses and shocks while maintaining its capabilities for both now and the future (Krantz, 2001; Petersen and Pedersen, 2010).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology employed in data collection and analysis in the Kinondoni municipality. Aspects addressed in data collection include; the description of the study area and rationale for its selection; description of sampling procedures and pre-testing of the research tools; and the actual field work. Aspects addressed in data analysis include; coding, compiling, summarization, and presentation of the results in different forms such as tables, figures and charts as deemed appropriate.

3.2 Description of the study area and rationale for its selection

This study was conducted in Kinondoni municipality, a municipal in the Dar es Salaam city in Tanzania (figure 2). Dar es Salaam city lies at the Western Coast of the Indian Ocean. It is situated in the Eastern part of the Tanzanian mainland at 6º51'S latitude and 39º18'E longitude. It boarders the Coast Region in the North, West and South while to the East, there is the Indian Ocean (START, 2011a). Dar es Salaam city has a total surface area of 1,628 sq. kilometres out of which 235 sq.kms or 14.4 percent is covered by water bodies in which the Indian Ocean covers the larger part. The remaining 1,393 sq.km are land area.

According to the 2012 Population and Housing Census, the city had a population of 4,364,541 in which 929,681 come from Kinondoni municipality with a population average annual growth rate of 5.6 percent from 2002 to 2012 (URT, 2014; URT, 2017). Dar es Salaam city is the main destination in rural-urban migration in Tanzania, which the country has witnessed since the 1990s (Mkalawa and Haixiao, 2014). Rural-urban migration and birth rates equally share the increase in Dar es Salaam's population (Odhiambo, 2009). Administratively, Dar es Salaam Region is divided into 3 municipal districts namely: Kinondoni, Ilala, and Temeke with five councils namely: Kinondoni, Ilala, Temeke, Ubungo and Kigamboni municipal councils (figure 2). The study was conducted in urban and peri-urban areas of Kinondoni municipality, in Dar

es Salaam city in Tanzania. Kinondoni municipality was established by the United Republic of Tanzania to an autonomous body in 2000. The Municipal Council is divided into twenty (20) wards which are; Kawe, Mbezi juu, Mzimuni, Wazo, Hananasifu, Mabwepande, Mbweni, Bunju, Kinondoni, Kigogo, Kunduchi, Msasani, Magomeni, Ndugumbi, Mwananyamala, Kijitonyama, Tandale, Makongo, Makumbusho and Msasani (figure 3). The Municipal also has 2 electoral constituencies namely: Kawe and Kinondoni (URT, 2017).

Kinondoni Municipality is bordered by the Indian Ocean to the North East, Ilala and Ubungo Districts to the South. The Municipality is well linked by roads and other communication networks to the rest of the city and other parts of the country. Major road links are: - Morogoro Road, Bagamoyo Road, Kawawa Road, Ally Hassan Mwinyi and Mwai Kibaki road (URT, 2017). Climatically, Kinondoni Municipality experiences a modified type of equatorial climate. It is generally hot and humid throughout the year with an average temperature of 29˚C. The hottest season is from October to March while it is relatively cool between May and August with temperature around 25˚C. There are two rain seasons: - short rain from October to December and long rain season between March and May. The average annual rainfall is 1300mm. The climate is also influenced by the Southwest monsoon winds from April to October and Northeast monsoon winds between November and March (URT, 2017).

Kinondoni municipality has been selected because it has the highest population of about 929,681 at the region while some maintaining rural background at the same time (URT, 2013). Kinondoni municipality is presumed to have the highest concentration of urban farmers as it is within the biggest city of Dar es Salaam with many residents of different backgrounds (URT, 2014). However, Kinondoni municipality was selected to be a case study because UPA is amongst the major economic activities taking place in the area (Mlozi et al., 2014; Victor et al., 2018). The study area is representative and suit to the study as it shares the characteristics of urban and peri-urban areas in many cities in SSA. The results can be transferred to other cities in SSA conducting UPA as they are characterised by rapid growth of population and the increased number of urban population engaging in UPA.

Figure 2: The map of Dar es Salaam Region

Source: GIS Unit, Institute of Resource Assessment, University of Dar es Salaam (2017).

3.3 Sampling procedures

Purposive sampling design was employed in selection of specific areas (wards) to be involved in this study. Likewise, it was employed in selection of key informants and local market traders that were employed in this study. In total, five wards out of twenty wards that make Kinondoni municipality were purposively selected (figure 3). The five wards namely Bunju, Kunduchi, Mabwepande, Mzimuni and Wazo were selected based on their involvement in

UPA, and there are a good number of farmers who engage in farming activities than the other remaining wards.

However, a random sampling technique was employed in selecting individual farmers who were participating in UPA. The sample size of 20% of all crop producers (about 1,930) was employed in this study (table 1). This is 10% more than what is recommended in the literature (Kothari, 2004; Kombo and Tromp, 2006). Other respondents included in this study were agricultural officers from the municipality and studied wards and local marker traders of agricultural products. Nevertheless, five (5) groups of six people each from the five wards were formulated for focus group discussions. Table 1 summarises the groups of respondents employed in this study and the total number of farmers from the five studied wards.

Table 1: Study sample in Kinondoni Municipality

Selected wards	**Bunju**	**Kunduchi**	**Mabwepande**	**Mzimuni**	**Wazo**	**Total**
No of farmers	212	589	509	142	478	**1,930**
Selected farmers 20%	118	42	102	28	96	**386**
Ward extension officers	1	1	1	1	1	**5**
FGDs participants	6	6	6	6	6	**30**
Local market traders	–	–	–	–	–	**5**
Municipal extension officers	–	–	–	–	–	**2**

Source: Field survey, (2018)

Figure 3: Kinondoni Municipality map showing the study area

Source: GIS Unit, Institute of Resource Assessment, University of Dar es Salaam (2017).

3.4 Data collection

Data collection employs two approaches. Approaches for primary data collection and those that were used to collect secondary data. Primary data collection involves the use of different techniques such as in-depth interviews, semi-structured questionnaires, focus group discussions and direct observations, while secondary data collection involve the use of published and unpublished reports such as Dar es Salaam region socio-economic profile, books, journals and internet search. For primary data collection, pre-testing of

the research tools was conducted before starting the actual data collection exercise. The actual data collection exercise employs the following techniques;

3.4.1 In-depth interviews

In-depth interviews were carried out to collect qualitative data in this study. The research instrument with open-ended questions was prepared and administered to the selected informants from the study area. The exercise intended to capture information on gender-role changes, how people acquire land for UPA, the benefits obtained from UPA on peoples' livelihoods, and the market system of UPA products. The in-depth interviews were employed with the ward agricultural extension officers, district agricultural officers and local market traders on the market structure and sources of crop products they sale.

3.4.2 Semi-structured Questionnaires

Questionnaires with close-ended and open-ended questions were administered to collect both quantitative and qualitative information from a sample of individuals participating in UPA. Examples of data collected using this technique include drivers for gender participation in UPA; level of participation between men and women; their age; level of education; size of households and the amount of income earned through selling their crops. On the other hand, open ended questions provided information on the effects of UPA to the livelihoods from men and women dominated activities together with the challenges facing urban farmers in the whole process of conducting UPA.

3.4.3 Focused group discussions

Five focus group discussions (FGDs) were conducted in the five studied wards to the people who had thorough knowledge about UPA practices. The method employed in the collection of information on; changes on gender roles in UPA; motivational factors for men and women to participate in UPA, and the effects of UPA to the livelihoods from men and women dominated activities.

3.4.4 Direct observations

Direct observations involved a researcher walking through the studied sites and observes the actual activities taking place. This approach entails to cross-check the information collected during the in-depth interviews, focused group discussions and household questionnaires. Direct observations helped the researcher to eradicate biases from respondents' views and provide information relating to what is currently happening on the site. This involved taking photographs and observing the physical environment of the municipality in the study area. A summary of the number of respondents interviewed per each approach is as presented in table 2 below.

Table 2: Number of respondents as per each method used in data collection

Sno.	Method of data collection	Number of respondents	Technique for data analysis
1	In-depth interviews	9	Content analysis
2	Semi-structured questionnaires	386	Descriptive and inferential statistics
3	Focus group discussions	30	Content analysis

Source: Field survey, 2019

3.5 Data processing and analysis

Data processing and analysis was post field work. It involved coding, compiling, summarizing, analysing and presenting data collected from different methods. Both qualitative and quantitative techniques were used to analyse the data (Creswell and Plano, 2011).

3.5.1 Sustainable/quality livelihood index

In developing countries, where most families derive their livelihoods from agriculture, sustainable agriculture cannot be discussed in isolation from sustainable livelihoods or the quality of livelihoods. Sustainable livelihood is a multidimensional concept and refers to maintenance or enhancement of access of families to food and income-generating activities on a long-term basis (Krantz, 2001; Yadav et al., 2014). A livelihood is sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Chambers and Conway, 1992). A sustainable livelihood/quality livelihood index was created based on 8 items collected through semi-structured questionnaires assessing the benefit obtained from UPA (Kamaruddin, and Samsudin 2014). Each item was given a value of 1 if the response was yes and 0 otherwise. The index was then obtained by summing values of all 8 items. Based on the median value of the index, respondents were then grouped into two categories, sustainable and unsustainable livelihoods. An individual was considered to have a sustainable livelihood/quality livelihood if their livelihood index was above the median value.

3.5.2 Statistical analysis

Both descriptive and inferential statistics were used. People's perceptions and knowledge of UPA in relation to livelihoods was captured through content analysis. Quantitative data analysis was conducted using Statistical Package for Social Sciences (SPSS) software version 26. Tabulation is part of the technical procedure, wherein the classified data are put in the form of tables (Kothari, 2004) including cross-tabulation and frequency tables. Multiple-response questions were analysed to give frequencies and percentages.

Continuous variables are presented using mean and median, while categorical variables are presented using frequencies and percentages. The relative risk (RR) concept was used to assess gender differences in agricultural activities involvement. An estimate of RR >1 indicates that males are more likely to be involved in agricultural activities than females, while a relative risk value of <1

is an indication that males are less likely to be involved in agricultural activities than females.

Likewise, the association between gender and sustainable livelihood was assessed using logistic regression models. The logistic regression model found to be appropriate, as the outcome of interest (livelihoods) was grouped into two categories (sustainable and unsustainable livelihoods). A two-stage approach was used for the analysis. Firstly, a bivariate model (unadjusted) was fitted for each independent variable and outcome variables to estimate the crude odds ratios (OR) and 95% confidence intervals (CI). Secondly, to obtain adjusted odds ratios (AOR) for the association between gender and sustainable livelihood, a multiple-logistic regressions model was then fitted. The model was adjusted for all independent variables with a p-value of less than, or equal to, 0.25 in the bivariate analysis (Agresti, 2002). The analysis was adjusted for current marital status, age, education level, ward of residence, and other sources of income. The final model included all variables that were significant at the 5% level. The general multiple-logistic regressions model is given as:

$$\log it[\pi(x)] = \log\left(\frac{\pi(x)}{1-\pi(x)}\right) = \beta_0 + \beta_1 x_1 + ... + \beta_p x_p$$

Where $\pi(x)$ is the likelihood of having a sustainable livelihood for subjects with x characteristics, $x_i's$ are covariates such as gender, and $\beta_i's$ are their respective parameters. The results of the model are presented in the form of a regression parameter estimate and estimated odds ratios (OR). The estimated OR, determined by taking the exponent of the regression parameter estimates, shows the increase or decrease in the likelihood of having the outcome of interest for subjects at a given level of the independent variable as compared to those in the reference category. For example, if we compare the sustainable livelihood of males and females, then an estimate of OR > 1 indicates that the likelihood of having a sustainable livelihood is higher among males than females. Similarly, an estimate of OR < 1 specifies that the chance of having a sustainable livelihood is lower among males than females, whereas an estimate of OR = 1 is an indication of no difference in prevalence of sustainable

livelihoods between males and females (Agresti, 2002). Tables, charts, graphs, photographs and figures were used to present the key findings of the study.

3.6 Ethical consideration

Nuremberg Codes insist on compliance with the principles of research ethics (Mwanje, 2001). This study maintained the principles of research ethics, such as the principles of voluntary consent, confidentiality, and enhancement of the rights of individuals. Respondents' participation was voluntary; information provided by the respondents was treated as confidential.

3.7 Limitation of the study

The study focused on the people who are conducting UPA in Kinondoni municipality. Though the work was generally successful, some difficulties were encountered during the data-collection process. In conducting in-depth interviews with the local market leaders, there was a challenge of political sensitivity. The respondents thought that the researcher had been sent by the government to seek information from them that could have negative impact to their activities. In solving this, the researcher gave a thorough explanation of the purpose of the study and that the researcher was just a student and not sent by the government.

It was also difficult to get the agricultural extension officers for an interview at the ward level because the same ward extension officer is also doing some works at the municipal level which caused difficulties to find them in their wards. The problem was solved by communicating with them through phones and arranging when and where to meet for the interview.

Rainfall was also a great challenge. The year of 2018 experienced abnormally heavy rainfall in April and May 2018. It sometimes rained three days consecutively without stopping. The situation made it difficult to reach farmers for interviews and this caused delays in the data-collection of baseline information. Also, rainfall made it difficult to get to some farmers, because their farms had been washed away or filled by mud and sand, which made them unreachable.

The focus-group discussions went smoothly, as the farmers were well prepared by the ward extension officers. People in the groups were cooperative and freely gave their views. The only challenge here was the expectations of the respondents for motivation. The ward extension officer explained to them that the researcher is a student and they were requested to participate without expecting any reward. The discussions went well; men and women participated fully in the discussions.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

MEN'S AND WOMEN'S PARTICIPATION IN UPA

4.1 Introduction

Chapter four to chapter seven presents key findings that emanated from this study as per respective specific objectives. Discussion for each finding will be provided immediately following the presentation of the key findings. Thus, this chapter presents the research findings with regards to the first specific objective on the extent of men's and women's participation in UPA and how their role is described in the study area.

4.1.1 General Characteristics of the Respondents

It was imperative for this study to be acquainted with socio-economic characteristics of respondents, since they influence their (respondents) day-to-day interaction with the environment in their search for a livelihood. The composition of the household in terms of gender, age, household size, marital status, education, and various economic activities in which they are engaging are presented in separate sub-sections below.

4.1.1.1 Gender and age of the respondents

Based on questionnaires administered to the sample size of 386 UPA farmers, 44.8% were males and 55.2% were females. Thus, the percentage of females exceeds that of males by 10.4% (table 3). The study further revealed differences in gender composition within the sample collected from five studied wards as indicated in figure 4. More females were coming from Bunju (57.6%), Mabwepande (61.8%) and Wazo (53.1%) of all respondents within the respective wards. Kunduchi and Mzimuni wards constitute of more males about 57.1% and 53.6% respectively of all respondents within the respective wards (figure 4).

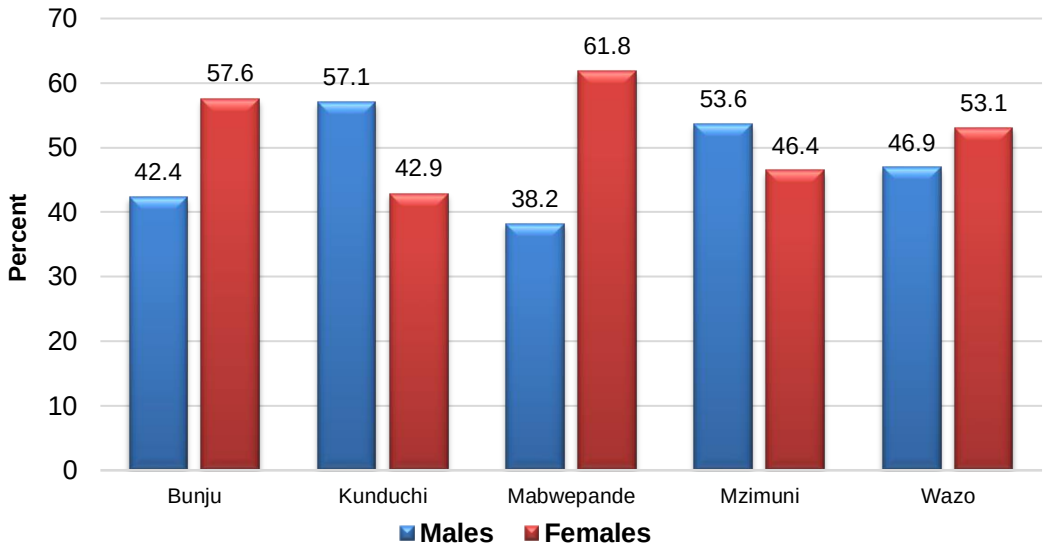

Figure 4: Gender of the respondents in five studied wards

Source: Field survey, 2018

Concerning age, respondents in the five surveyed wards ranged from 18 to 72 years old, the mean age being 42 years old (table 3). The large segment of the studied population was at the middle age between 34-49, which accounted for about 50.3%, of which 22% were males and 28.2% were females, thus female respondents dominated this age group. Only 3.6% (2.5% males and 1.1% females) of the respondents were aged between 66 and above (Table 3). The middle age group between 34-49 years old was the most active group; in this group still, females were dominant. This age group is in line with the age structure of the Tanzanian working population which ranges between 15 to 64 years of age (URT, 2014).

Table 3: Age composition of the respondents

	Gender composition		Total
Age groups	**Males**	**Females**	**N = 386 (100%)**
18-33 years	43 (11.1%)	51 (13.2%)	94 (24.3%)
34-49 years	85 (22.1%)	109 (28.2%)	194 (50.3%)
50-65 years	35 (9.1%)	49 (12.7%)	84 (21.8%)
66+ years	10 (2.5%)	4 (1.1%)	14 (3.6%)
Total	**173 (44.8%)**	**213 (55.2%)**	**386 (100%)**

Source: Field survey, 2018

From these results, it has been revealed that women were involved more in UPA than men by 10.4%, the reasons could be perhaps men are preferred to engage themselves in other types of income generating activities such as crushing stones, driving motorcycles, small businesses and sometimes carrying luggage in the market and industrial areas than UPA. Unlike men, women prefer UPA because in most cases this activity takes place close to their homes, so it is easy to do other domestic activities while at the same time attending their farms.

The findings from this study concerning gender of the respondents concur with other studies done elsewhere in most African countries where UPA is practiced (FAO, 2001; Sithole et al., 2014; Mwangi, 2015; Syonga, 2015 and Malekela, 2019). In these studies, it has been shown that females play a central role in UPA. The study by Sithole et al. (2014) revealed that the major reason for more females' participation in UPA is their reproductive roles of ensuring that children in the family have food at all costs especially the married women. A study by Malekela (2019) established that more female (more than 54%) engaged in UPA in the city of Dar es Salaam. The study by Mwangi (2015) revealed that a majority of the respondents doing urban agriculture in the county of Nairobi (more than 64%) were females.

However, age is a very important aspect to be studied, as most of the relationships in the community depend on age. The results from this study are similar to the study conducted by Malekela (2019), who also showed that most

of the participants in UPA were of middle age, there was no large number of younger men and women. The dominant age of the respondents in this study was between 41 and 60, while the study conducted by Sebata et al. (2014) showed the dominant age to be between 31 and 40 years, which falls under the middle age group; women also dominated that age group.

4.1.1.2 Education level and occupation status of the respondents

Respondents in the Kinondoni municipality had attained different levels of education, as shown in table 4. More than 73% of respondents attained primary education and only 4.9% of respondents had attained tertiary education; this group includes those people who had attended universities, medical and technical schools, technical colleges and teacher's training colleges. Post-secondary technical and vocational training are also included in tertiary education (Oketch et al., 2014). The great proportion of the population in the study area who participate in UPA had low levels of formal education (primary education). This was supported by the type of employment that dominates the community, as 92.5% of the respondents were employed in informal sectors, while only 6.0% of the respondents were employed in formal sectors.

From the five wards studied, Bunju was found to have more respondents with tertiary education, which accounted for about 52.6% of all respondents with tertiary education in the study area. The ward also had many respondents with secondary and primary education, making up about 41.7% and 29.4%, respectively, of all respondents in the study area. Most of the respondents with informal education (about 32.4%) of all respondents came from Wazo ward, while Mzimuni ward had no respondents with tertiary education.

Table 4: Education level of the respondents in the five Wards studied

Wards		Education level				Total
		Informal	Primary	Secondary	Tertiary	
Kunduchi	N	6	29	5	2	42
	% Within the Ward	14.3	69.0	11.9	4.8	100.0
	% Within the Sample	16.2	10.3	10.4	10.5	10.9
Wazo	N	12	67	13	4	96
	% Within the Ward	12.5	69.8	13.5	4.2	100.0
	% Within the Sample	32.4	23.8	27.1	21.1	24.9
Bunju	N	5	83	20	10	118
	% Within the Ward	4.2	70.3	16.9	8.5	100.0
	% Within the Sample	13.5	29.4	41.7	52.6	30.6
Mabwepande	N	11	79	9	3	102
	% Within the Ward	10.8	77.5	8.8	2.9	100.0
	% Within the Sample	29.7	28.0	18.8	15.8	26.4
Mzimuni	N	3	24	1	0	28
	% Within the Ward	10.7	85.7	3.6	0.0	100.0
	% Within the Sample	8.1	8.5	2.1	0.0	7.3
Total	**N**	**37**	**282**	**48**	**19**	**386**
	%	**9.6**	**73.1**	**12.4**	**4.9**	**100.0**

Source: Field survey, 2018

Cross tabulation was done to show the relationship between education and employment status of the respondents (table 5). However, the study revealed a clear relationship between education of the respondents and their employment status. More than 70% of all respondents with tertiary education were permanently employed in the formal sectors and involved in UPA as a part time activity, while 10.5% were previously employed in formal sectors but they had retired from their jobs and opted to be involved in UPA (table 5). Only 15.8% of respondents with tertiary education were self-employed. The majority of the respondents (98.9%) with primary education in the study area were self-employed in various activities, including agriculture. The study shows that people with different levels of education from primary to tertiary education and those with informal education were engaging in UPA. UPA in the study area was undertaken by urban residents as one of the main activities to ensure food security and alleviate poverty. Nevertheless, people with different employment status from employed, self-employed and retired people were also engaging in UPA activities as an alternative way of increasing their income, insuring food security; others engaged in UPA for leisure.

Education is an important attribute in stimulating people's understanding and boosting their active participation in various undertakings. However, creativity and innovation in the society and education are seen as key elements in the recovery strategies to counter the economic crisis (EUNEC, 2009). According to URT, (2003), in most developing countries education is the most important tool for liberating people from poverty. Education is also used as a survival strategy, by selecting few members of the household to seek formal employment in the formal sectors where the skilled and efficiency labors are employed (Todaro, 1992). Examples of formal sectors are those in secondary and tertiary economic activities like manufacturing and processing industries, education and health sectors where goods and services are provided.

Table 5: The relationship between education and occupational status of the respondents

Education	**Occupation status**				
		Employed	**Self employed**	**Retired**	**Total**
Informal	N	1	36	0	37
	% Within education	2.7	97.3	0.0	100
	% Within occupation	4.3	10.1	0.0	9.6
Primary	N	2	279	1	282
	% Within education	0.7	98.9	0.4	100.0
	% Within occupation	8.7	78.2	16.7	73.1
Secondary	N	6	39	3	48
	% Within education	12.5	81.2	6.2	100.0
	% Within occupation	26.1	10.9	50.0	12.4
Tertiary	N	14	3	2	19
	% Within education	73.7	15.8	10.5	100.0
	% Within occupation	60.9	0.8	33.3	4.9
Total	**N**	**23**	**357**	**6**	**386**
	%	**6.0**	**92.5**	**1.5**	**100.0**

Source: Field survey, 2018

This study revealed that women respondents were dominant in informal and primary education, while male respondents dominated in secondary and tertiary level of education. The findings of this study demonstrated that the largest percentage of employed respondents were women (about 52.2% of all

employed respondents). The findings go hand in hand with the study conducted in Bulawayo by Sebata et al. 2014, which revealed that male respondents dominated in tertiary education; they argued that the nature of education levels was very important in their study, because it reveals that education is not a guarantee for securing employment. The same is shown in this study, insofar as male respondents dominated in tertiary and secondary education, but women dominated in formal employment. In this case, more males with tertiary education in the sample were not employed in formal sectors, instead opting for self-employed activities including UPA.

Table 6: The relationship between gender, education and occupation

Gender	**Education Level**				**Total**
		Informal	**Primary**	**Secondary**	**Tertiary**	
Males	N	12	122	28	11	173
	% Within the gender	6.9	70.5	16.2	6.4	100.0
	% Within education	32.4	43.3	58.3	57.9	44.8
Females	N	25	160	20	8	213
	% Within the gender	11.7	75.1	9.4	3.8	100.0
	% Within education	67.6	56.7	41.7	42.1	55.2
Total	**N**	**37**	**282**	**48**	**19**	**386**
	%	**9.6**	**73.1**	**12.4**	**4.9**	**100.0**

Gender	**Occupation Status**				
		Employed	**Self employed**	**Retired**	**Total**
Males	N	11	158	4	173
	% Within the gender	6.4	91.3	2.3	100.0
	% Within Occupation	47.8	44.3	66.7	44.8
Females	N	12	199	2	213
	% Within the gender	5.6	93.4	0.9	100.0
	% Within Occupation	52.2	55.7	33.3	55.2
Total	**N**	**23**	**357**	**6**	**386**
	%	**6.0**	**92.5**	**1.5**	**100.0**

Source: Field survey, 2018

4.1.1.3 Marital status and household size of the studied population

Focus-group discussions and in-depth interviews revealed that a strong relationship among the family members is foreseen to improve the income of the family, since every member will contribute to the wellbeing of the family.

The study showed that the majority of the respondents (about 78.5%) were married (figure 5). The size of households (number of people living together in one house) in the study area is presented in figure 6. The average number of members in the household was found to be 5 (4.9), while most of households showed to have 4 or 5 members (75 households in each group). It appeared that one household had 20 members, which was the highest value, while 26 households had only one member each.

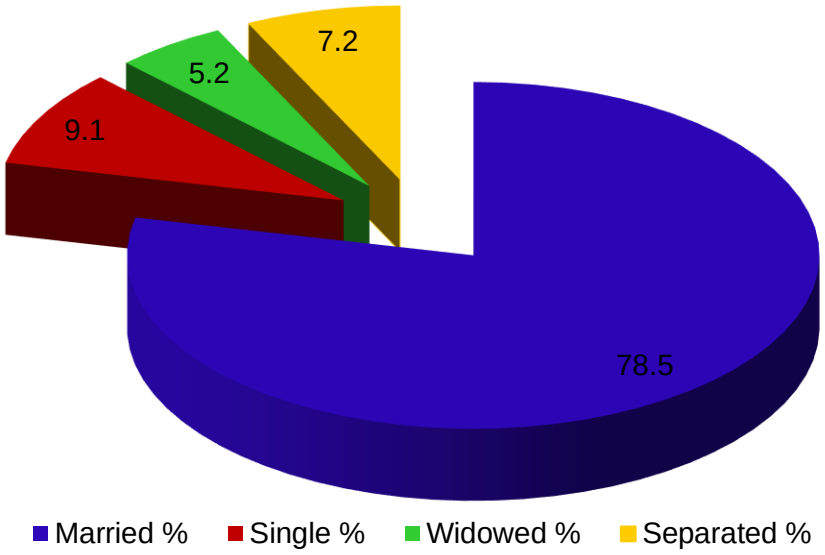

Figure 5: Marital status of the studied respondents

Source: Field survey, 2018

Household size has implications for agricultural production and for socio-economic development, division of labour for improving UPA in the study area, and people's livelihoods (Heggar, 2006). However, marital status has an implication for social organization, resource management and crop production (Low, 2005; Heggar, 2006). Most married small-holder farmers relied on family labour, reducing the requirement to hire labour and thereby reducing their financial obligations. According to Low (2005), a stable family can have a good system of organizing agricultural work, as all members of the family will participate fully in production activities. That situation was also seen in the current study area, as most of the farmers work together with their family members.

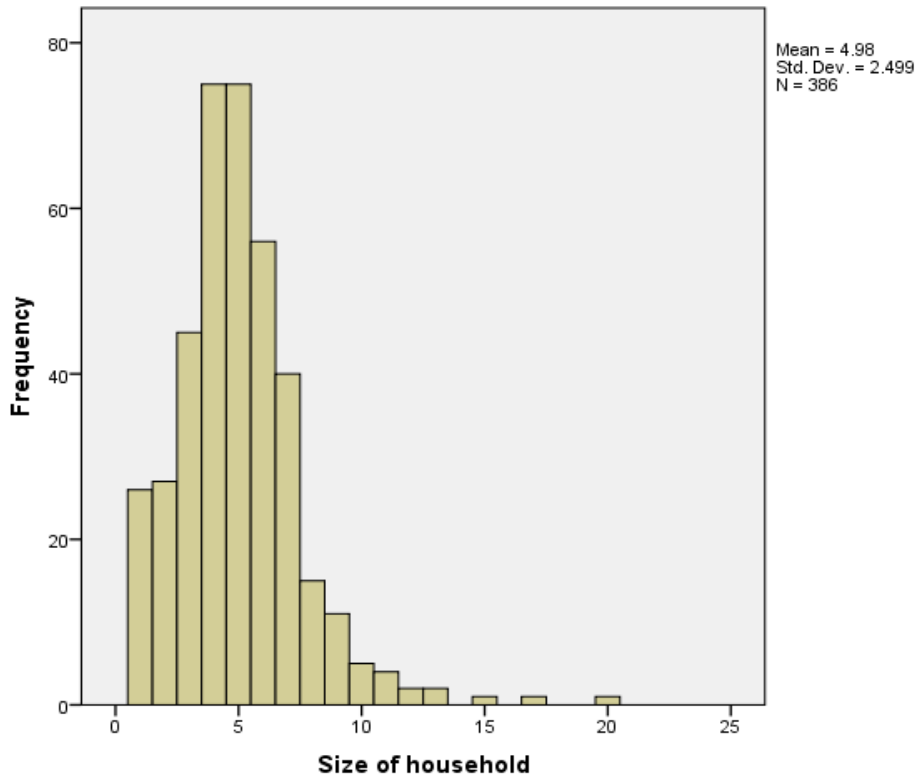

Figure 6: Composition of household sizes from the study area
Source: Field survey

4.1.1.4 Origin of the respondents

The study revealed that in and around the city of Dar es Salaam, crop production is dominated by people with a rural background, as 85.5% of the respondents were migrants from different regions of Tanzania and only 14.5% were natives of the Dar es Salaam city (figure 7). The same situation was shown by Malekela (2019), who found that most of urban and peri-urban farmers (more than 90%) were migrants from rural areas. Rural-urban migrants hope for formal employment and higher wages in the cities, since in the rural areas there is a problem of unemployment and low wages (Shamshad, 2012). Many rural-urban migrants move to city centers seeking for better livelihoods with their agricultural backgrounds and often ending up engaging themselves in informal activities such as petty trade, quarrying, crushing stones, fishing, small businesses and UPA. Some of the migrants move to urban areas with

the aim of doing farming activities, believing that there is a better market for agricultural products in the city centres than in the rural areas.

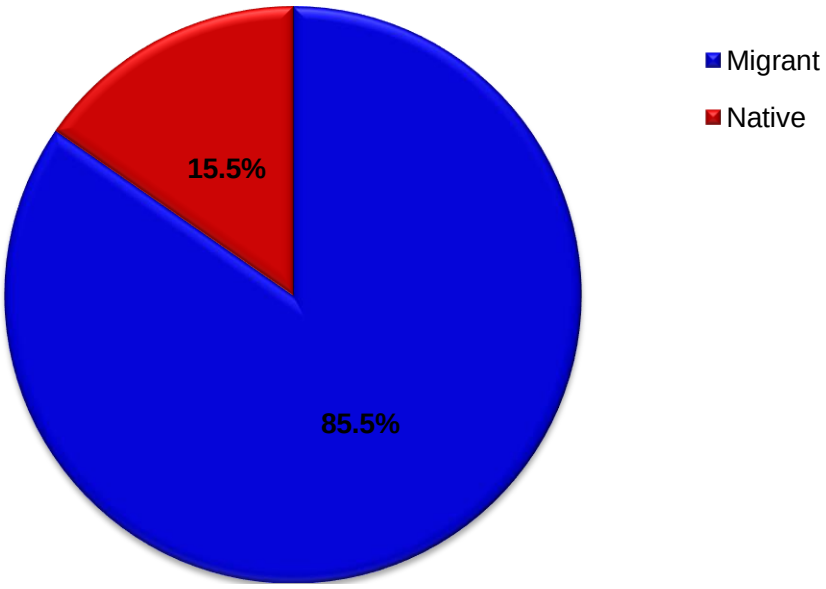

Figure 7: Origin of the respondents in the study area
Source: Field survey, 2018

4.1.2 Description of how UPA is practiced in the study area

UPA in the study area is carried out in different locations with a variety of crops that are produced in different scales. Through in-depth interviews and focus-group discussions, the study showed that UPA activities are conducted in different locations, including the backyards, open spaces like river valleys and road reserves, building plots; few cultivated on their own farms. One of the extension officers pointed out that farming in her ward is, to a large extent, taking place in open spaces and in people's plots that have not yet been developed by owners. She said that:

"*Most of the land is occupied by other things like houses and industries, so people find open spaces like road reserves and river valleys to conduct farming. Other farmers in the city use other peoples' plots which are not yet developed by the owners. For example, in Kilongawima street people are cultivating on the road reserve areas… at Ununio street people are cultivating in the*

government open spaces, including a plot owned by Daily news media." [Agricultural Officer 3; Position: 21-21].

Farming activities in the study area take place in open spaces and building plots because there is no specific area for urban farming. Also, land in the study area is almost fully occupied by other developmental activities like industries, settlements and business centers. So UPA farmers are struggling to find areas for farming to sustain their livelihoods.

4.1.2.1 Land ownership

Land used for agricultural purpose in Kinondoni municipality was found to be very limited, and most of the urban and peri-urban farmers did not have their own land. The study shows that the majority of UPA farmers (more than 49%) cultivate between 0.1 and 0.2 acres and those who cultivate 4.0 and more acres were only 0.5% (figure 8). Similar findings were observed by the studies conducted by Hamis (2012) in Arusha, in Kenya by Ogendi et al. (2014) and that conducted by Mhache (2015) in Dar es Salaam. These studies revealed that most of urban farmers normally cultivate on small pieces of land, as the largest portion of the land in the city has been utilized for other purposes. The situation has caused many farmers who want to own larger pieces of land to shift from the city centre and go to the peri-urban areas or to the nearby regions where land is available. Also, poor people who do not have enough money to buy their own land keep on moving from one location to another within the city, looking for open spaces or undeveloped plots to conduct UPA.

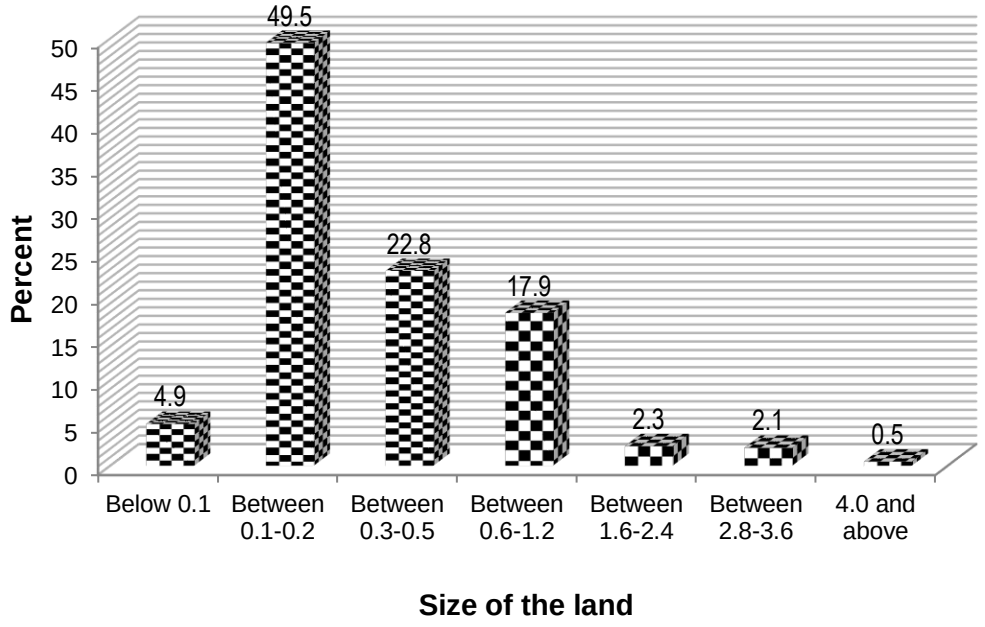

Figure 8: The size of land cultivated by UPA farmers in the study area in acres

Source: Field survey, 2018

This study also revealed that a majority of farmers (38.9% of respondents) cultivate on freehold land which the owners give them for free to take care of the land until the time they want their land for their own activities. More than 52% of farmers in Bunju ward and 50% from Mabwepande ward are cultivating on freehold land because in those wards there are many plots planned for settlement but not yet developed (figure 9). Thus, people are taking those plots and cultivating them for free. One participant from the focus-group discussion claimed to cultivate six plots in different locations within Mabwepande ward. He said that:

"I don't have my own land for cultivation, I used to take the plots which are open and start to cultivate, if the owner come and chase me away, I move to another plot. Some of the land owners are so kind; they used to give their plots to us to cultivate seasonal crops. Some are becoming very furious when they found you cultivating in their plots without their permission. Last year (2017) I got a loss of one plot as the owner of the plot put sands and bricks on unharvested crops". [Ward 3; Position: 28-28]

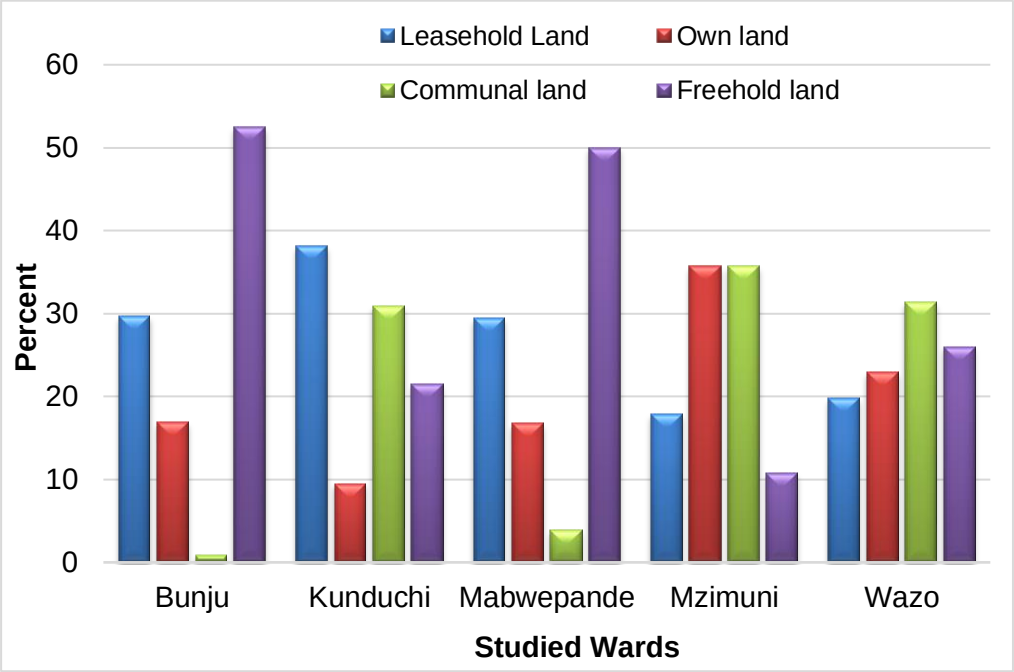

Figure 9: The nature of land ownership for UPA cultivation
Source: Field survey, 2018

Some of the farmers, accounting for about 15% of all respondents in the study area, were using communal land found in their localities for cultivation. People are using open spaces like road reserves and areas reserved for further developmental activities like building a market, hospital or school. The study conducted by Bishoge (2017) in the city of Dar es Salaam revealed that most of the urban agriculture in the city of Dar es Salaam is conducted in open spaces. For example, in Mzimuni ward about 35.1% of all respondents in the ward were using communal land for cultivation. They used the land around Msimbazi river valley, which was not owned by an individual, therefore every person has the right to use it. In Kunduchi ward about 30.9% of all respondents in the ward are cultivating on the communal land found along the road reserves and others at Kilongawima Street are cultivating in the open space reserved to be a future market. One of the farmers in focus-group discussions said this:

"We have been given the open space by our street local government to cultivate which later is expected to be a market area." So, when they start to build the market, we will find another place for cultivation" [Ward 5; Position: 48-48]

Therefore, the cultivation in the study area is, to a large extent, temporarily keeping on shifting from one place to another to find land for farming activities. Most of the respondents (about 85%) claimed to conduct farming activities temporarily because they don't have permanent land for farming activities in the city and only 15% conduct permanent farming (figure 10). Findings from this study correlate with studies by Kiduanga and Shomari (2017) who show that most of the vegetable growers in Dar es Salaam city use land on a temporary basis and this made them ready to move out any time when needed by the land owners. Also, Drechsel and Dongus (2009) and Malekela (2019) conducted a study in Dar es Salaam, which showed various changes of farm locations due to urban sprawl leading to farmland scarcity.

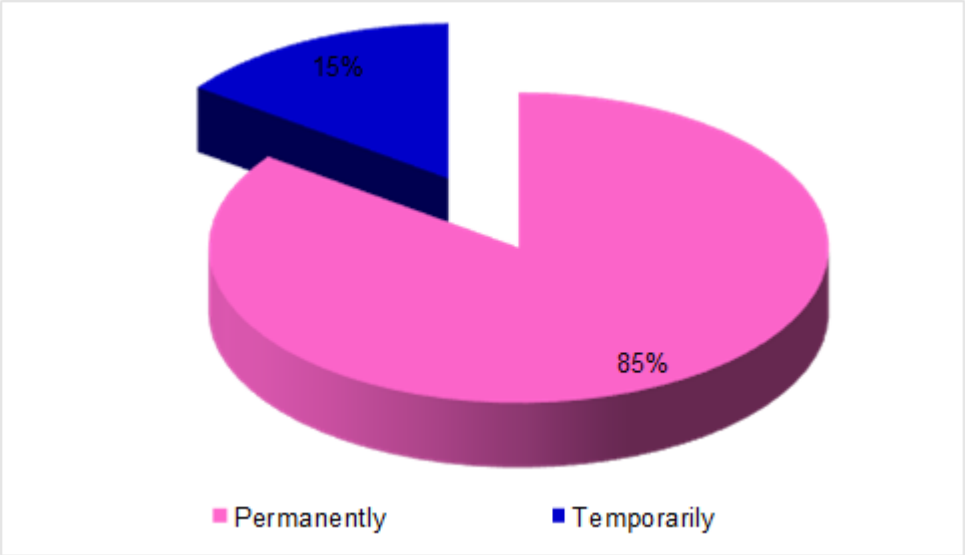

Figure 10: Sustenance in farming lands
Source: Field survey, 2018

4.1.2.2 Crops grown in the study area

To understand the crops grown in the study area was very important, as it has direct connection with the type of land ownership, the market of UPA products, and the income they generated. Crops grown in the area determine the condition of the available market, the way the available land is utilized, and how the crops generate income. Crops grown by most UPA farmers vary from vegetables to maize and fruits (table 7). However, vegetables are the main

crops grown in the study area, with a variety ranging from green vegetables such as sweet potato leaves, pumpkin leaves, Chinese cabbage, amaranth and black nightshade, to tomatoes, okra, eggplant, onions, and peas. Farmers also cultivate rice, maize, cassava, and fruits such as pawpaw, banana, and watermelon. Plate 1 shows the variety of crops grown in the study area. More than 83% of the respondents were cultivating vegetables, followed by 39.3% who were cultivating maize. Only 4.2% of all respondents were producing onions. Most of farmers who produce onions were coming from Bunju ward, which accounted for about 2.3% out of 4.2% of all respondents who produce onions. Thus, vegetables ranked number one in the production list, followed by other crops. UPA farmers in the study area prefer growing vegetables on their plots, because they not only save their household money by getting food directly, but also provide a regular income for household expenditure. Also, vegetables help them to use the available land resource effectively for a short period of time, as vegetables grow quickly and can be harvested several times in a season or a year. One of the respondents in a focus-group discussion said:

"*We always cultivate sweet potato leaves, spinach, pumpkin leaves and amaranth, which grow quickly…the land we are using is not ours, so we cultivate short-term crops" [ward 4; position: 31-31].*

Studies conducted by Mhache (2015) and Malekela (2019) also observed vegetables to be the common crops grown in the city of Dar es Salaam. The dominant vegetables in the study area were amaranths, sweet potato leaves, chines cabbeges and pumpkin leaves. The findings in this study concur with Von Thunen's theory of agricultural location, which suggests that perishable crops like vegetables need to be grown near the city centre, so as to reach the consumers in a fresh condition, while non-perishable crops such as wheat, maize, groundnuts, and beans are grown far away (O'Kelly and Bryan, 1996).

Table 7: Crops cultivated in the study area

Crops grown	Ranking	Studied wards in Kinondoni Municipality					
		Bunju N=102 (%)	Kunduchi N=42 (%)	Mabwepande N=118 (%)	Mzimuni N=28 (%)	Wazo N=96 (%)	Total response N=386 (%)
Vegetables	i	103 (26.7)	41 (10.6)	82 (21.2)	26 (6.7)	72 (18.7)	**324 (83.9)**
Maize	ii	47 (12.2)	11 (2.8)	43 (11.1)	3 (0.8)	48 (12.4)	**152 (39.3)**
Fruits	ii	25 (6.5)	8 (2.1)	10 (2.6)	5 (1.3)	37 (9.5)	**85 (22.0)**
Cassava	iv	23 (5.9)	1 (0.3)	26 (6.7)	4 (1.0)	13 (3.4)	**67 (17.3)**
Tomatoes	v	8 (2.1)	1 (3.1)	19 (4.9)	5 (1.3)	21 (5.4%)	**65 (16.8)**
Rice	vi	17 (4.4)	5 (1.3)	22 (5.7)	3 (0.8)	11 (2.8)	**58 (15.0)**
Beans/peas	vii	21 (5.4)	1 (0.3)	18 (4.7)	4 (1.0)	9 (2.3)	53 (13.7)
Onions	vii	9 (2.3)	0 (0.0)	6 (1.6)	0 (0.0)	1 (0.3)	16 (4.2)

Source: Field survey, 2018 (Based on multiple responses)

Chines cabbage - Wazo ward

Okra - Bunju ward

Pumpkin leaves – Kunduchi

Water melon – Wazo ward

Banana – Kunduchi ward

Pawpaw – Mabwepande

Sweet-potatoes leaves – Bunju

Maize – Wazo ward

Rice – Mabwepande ward

Amaranth – Mzimuni ward

Cassava - Mabwepande

Eggplant – Bunju ward

Plate 1: A variety of crops grown in the study area

Source: Field survey, 2018

4.1.2.3 Market of UPA produce

Most of urban and peri-urban farmers in the study area are involved in agricultural activities for the purpose of getting food and sell their surplus for income generation. About 70.5% (272) of respondents are thus engaged for food and income generation, while about 29.5% (114) of the respondents are cultivating for the purpose of getting food only (substances farming) (figure 11). Thus, most UPA farmers in the study area cultivate crops not only to get food but also for the purpose of diversifying their sources of income. These findings are in line with several studies conducted in various cities of African countries (Onyango, 2010; Githugunyi, 2014; Mhache, 2015; and Malekela, 2019) which showed that most of the respondents engaged in UPA had their primary reason of getting food and generating income for their survival.

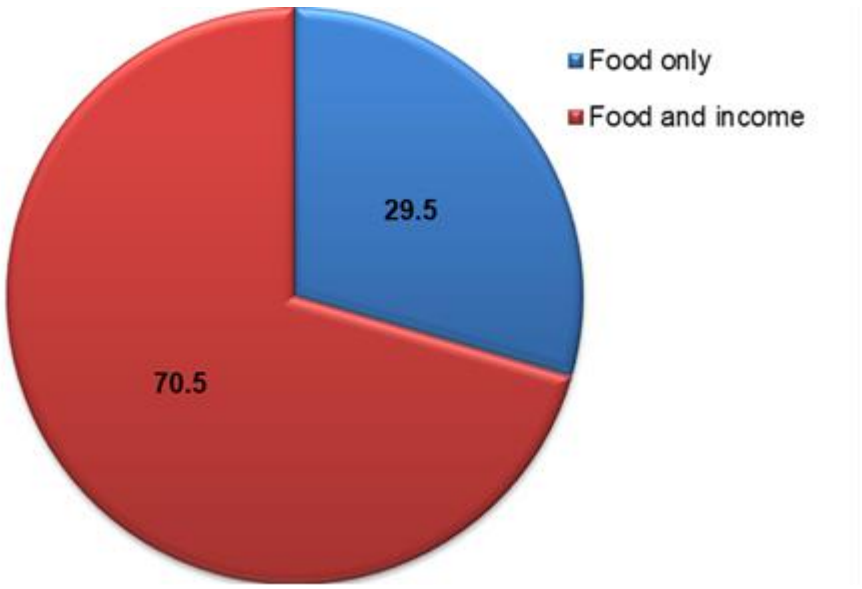

Figure 11: The main purpose of farming in the study area
Source: Field survey

Many farmers from the sample (more than 59%) claimed to sale their products directly from the farms to the middlemen. About 47% of all respondents sold their products to the local markets and only 1.6% of all respondents sold their UPA products to the supermarkets (table 8). This status of the market for UPA

products is because farmers produce types of crops that are greatly needed by the local people, who only buy things in the local markets. High-value crops like carrots, broccoli, parsley, and cauliflowers, which are much needed by people of different status within and from different countries and who usually buy their food from different supermarkets in the city, were not cultivated.

The study is also in line with the findings of Malekela (2019), conducted in the city of Dar es Salaam, which showed that most of urban farmers who sell their surplus usually sold them to the local markets, despite the fact that there is a rapid expansion of supermarkets in the city. She found that more than 95% of the respondents sold their produce to the local markets and only 1.8% sold their agricultural products to the supermarkets. Urban farmers claimed to have little access to the supermarkets, because their produce cannot compete with the imported produce in terms of quality and quantity.

However, crop products that are needed by almost all people in the city and have higher prices, such as rice, fruits, and cassava are cultivated by very few farmers in the study area. These crops take a couple of months to mature and need enough space to cultivate, and others demand a lot of water and fertilizers over a long period of time. Farmers were not able to cultivate such crops because most of them are cultivating temporarily, as the land is owned by other people, while some of the crops need a long time or permanent cultivation, like fruits and cassava. The study conducted by Sithole (2008) revealed that green vegetables are usually grown by urban farmers, as they mature within a short period of time for the farmers to quickly realize the outputs, compared to other crops which took a long period of time to mature. The results in this section are based on multiple responses and double counting was possible.

Table 8: The market for UPA products

Wards	At farm	Local markets	For subsistence	Supermarkets
Ranking	**i**	**ii**	**iii**	**iv**
Bunju	75 (19.4%)	53 (13.7%)	32 (8.3%)	1 (0.3%)
Kunduchi	34 (8.8%)	34 (8.8%)	1 (0.25%)	2 (0.5%)
Mabwepande	39 (10.1%)	35(9.1%)	48 (12.4%)	1 (0.3%)
Mzimuni	20 (5.2%)	20 (5.2%)	1 (0.3%)	1 (0.3%)
Wazo	61 (15.8%)	42 (10.9%)	32 (8.3%)	0 (0%)
Overall response	**229 (59.3)**	**184 (47.7)**	**114 (29.6)**	**5 (1.4)**

Source: Field survey, 2018 (Based on multiple responses)

Through focus-group discussions and in-depth interviews, farmers explained that it is better to sale crops directly from the farm for time-management reasons and the reduction of transport costs. One of the interviewees explained that:

"Selling direct from farm is much better than going to the market, though the price at the market is somehow higher. Because going to the market increase cost of transportation and it is time consuming." [ward 3; Position: 50-51].

The researcher of this study observed that farmers were comfortable in selling their crops directly from the farm, because transport is sometimes a problem, as most of the UPA farms that are at the periphery of the city are not well connected to transport networks. Most of the farmers who take their products to the local market used motorcycles to transport their products, which causes them to incur a lot of costs from the farm to the market areas. Plate 2 shows the harvested eggplants at Mabwepande ward waiting for the motorcycle to be taken to the local market located at Bunju B area.

Plate 2: Harvested eggplant crops at Mabwepande ward
Source: Field Survey, 2018

In the Kinondoni municipality, most farmers were selling their crops to traders rather than to retail consumers, whereby the traders travelled to farm sites to purchase farm goods. The study conducted in Tamale Ghana and Ouagadougou in Burkina Faso revealed the same situation as in the study area, that most farmers sale their crops to traders who took their goods to the market (Bellwood-Howard et al., 2015).

4.2 The extent of Men's and Women's Participation in UPA

This section analyses the extent of men's and women's participation in UPA. However, the section presents changes in gender roles and the causes of those changes. It also analyses and describes gender roles in urban and peri-urban agriculture.

Figure 12 indicates the extent of men's and women's participation in UPA. In capturing the extent of participation in UPA, a question with three possible answers was constructed. The question asked "Between men and women, who participate more in UPA in your area? The provided answers were: (a) Men, (b) Women, (c) Both men and women. The response on this question was as follows; most of the respondents about 49.7% (192) in the study area claimed

that more women were involving in UPA than men, while 29.8% (115) said that more men than women were involved in UPA. Only 20.5% (79) of all respondents claimed that both men and women are equally involved in UPA.

The study found that many women in the study area have decided to engage in farming activities to free themselves from life's difficulties caused by various factors, including suppression by their husbands or their husband's relatives. In women's focus-group discussions conducted in ward 2, one of the respondents gave the following explanations: -

"At the first time when I came in Dar es Salaam, I was looking for house maid works to get something which will help me to satisfy the needs of my family. I decided to do so because my husband had left away many years ago and I don't know where he is. In the village where I used to live his relatives were not ready to help me with my two children instead, they were taking even what I have in my house saying they belong to their relative. I did the house maid work for one year here in Dar es Salaam until I met my friend; she is like my sister… she advised me to engage in farming activities, she said farming pay more than the work I am doing. She gave me a plot in the open space where we are cultivating up to the moment, at least now I am getting food and extra money to do my things and taking care of my children." [Ward 2 females; position: 29-29]

The study conducted in Cape Town by Robertson (2013) revealed that 65% of participants in urban gardening in the study area were female, while 35% were males. This means that more females were active participants in the whole process of conducting UPA in Cape Town. The results concur with the findings in this study, as more than 55% of all respondents were females (figure 4). The study conducted by Gamhewage et al. (2015) in Sri Lanka showed that the extent of women participation in urban agriculture is influenced by socio-economic factors like their age, education, and family economy.

In many parts of Africa, women still bear many household responsibilities and households' welfare that is why they have dominated UPA. In most areas, married women with children are expected to fill the needs of the household

through their participation in UPA. Lee-Smith (2010) and Robertson (2013) also revealed that production is often done by females and reduces household expenses while contributing to the diet. Women also find difficulties in finding formal wage employment, due to lower educational status than that of men (Wilbers et al., 2004). Women play a primary role in maintaining food security in their households by supplying food through their productive labour, deciding about production, consumption and division of food, and buying food through the income they generate (FAO, 2001).

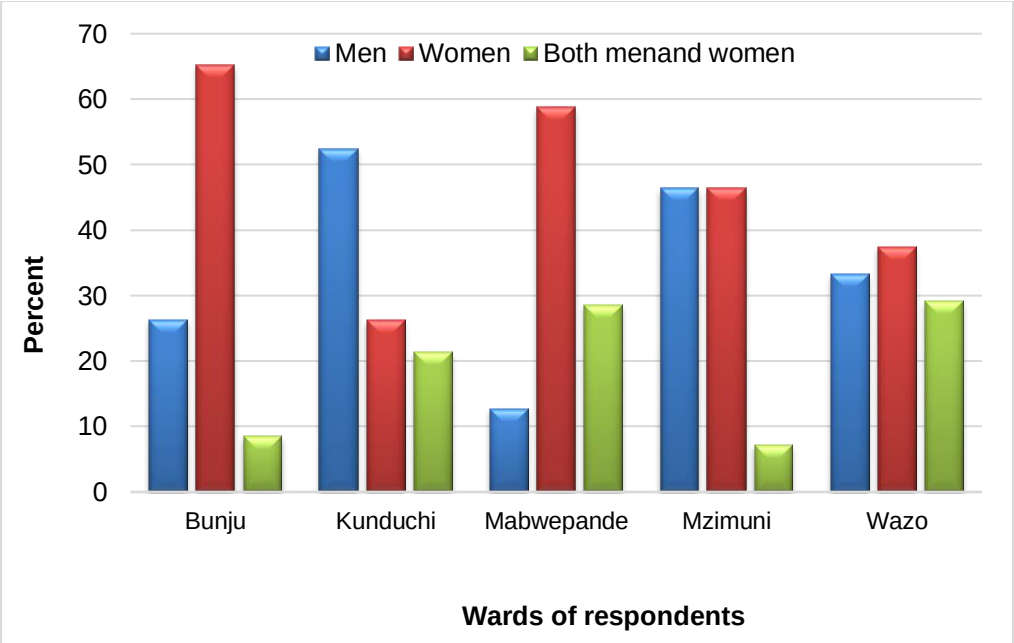

Figure 12: The extent of men's and women's participation in UPA

Source: Field survey, 2018

4.3 Changes of gender roles in the study area

Gender roles refer to the set of social and behavioural norms that are considered to be appropriate for people of a specific sex (Blackstone, 2003). The aspect of gender is important, since social roles in the community are basically ascribed to people basing on gender (Folke et al., 2005). There were various questions asked of the respondents which revolve around their roles and responsibilities within UPA activities. Through in-depth interview and focus-group discussions, the study identified that gender roles had changed into a more unbalanced responsibility between men and women in the study

area. Traditionally, women stay at home caring for the family, while waiting for their husband to provide for their needs. Things have changed, and now even women are earning for the family, while at the same time taking care of the family. The study discovered that there were several causes for the changes of gender roles among men and women in the study area. The report shows that the major reasons for gender-role changes were difficulties in life, and general technological changes that lead to the changes in traditions, customs and taboos.

The latter were discussed by all five groups and the respondents explained that in most of the communities where in the past patriarchal systems were dominant, women were not allowed to engage in paid labour of any kind, but now women are employed in formal and informal sectors. One of the respondents gave the following explanations:

"When I was young in my area of origin, women were doing only home-based activities, while men were engaging in farming activities for cash-crop production, particularly coffee. Married women were not allowed to be employed in the formal sector. Nowadays things have changed, and men and women are doing different work without considering gender differences. Here in Dar es Salaam, we have seen women driving cars, building houses and many other jobs that were meant to be for men, and men doing work that was meant to be for women, like conducting females' hair salons, cooking pancakes, decoration activities and other many works…". [Ward 1 males; position: 26-26]

Nevertheless, some focus-group discussions showed that changes of gender roles are due to difficulties in life and the rise in the cost of living. They said that in the past, one person who was working was able to provide everything for the family, but now it is very difficult. So as a family, every member should have something to do in order to support each other for the betterment of the family. The situation has made men see the importance of their wives having something to do. One of the respondents explained that:

"The changes in gender roles I can say have been caused to a large extent by the economic situation, because as women were expecting to get everything from their husband, we have realized that waiting for everything to be brought by our husbands wasn't enough for family satisfaction, so we have decided to wake up and assist our husbands in the provision of the family through farming activities to increase family income and make sure that food is available in the house". [Ward 2 Females; Position: 18-18]

This study shows that some women have decided to engage in different activities including farming activities to help their male counterparts provide for their families. The findings from this study resemble with results of the study conducted in Somalia by Abdi (2013) which showed that women's roles have been stretched beyond traditional limits to meet the new domestic, social and economic needs of the family and local community. Many women are now taking the main role of working in whatever way they can to provide an income for their families, even where men are present in the household. The study also shows that the changes and flexibility in gender roles which are being evident today has its roots in the changing social structure, economic factors, advancement in sciences and changed value systems.

4.4 Gender roles in UPA

The study also assessed how gender roles have been described in the study area among urban and peri-urban farmers. Table 9 shows how gender roles have been described at the household level in home-based and farm-based activities. Home-based activities are the activities at the household level, such as cooking, cleaning, taking children to school or clinic, paying bills, disciplining children, and providing shelter. Home-based or household activities are complementary and may enhance the growth and stability of the household if they are clearly defined. Findings in this study through focus-group discussions with farmers indicated that most home-based activities in the study area are performed based on norms, roles and responsibilities of males and females in the society. They go further, saying that many farmers in the study area come from rural areas where home-based activities are done mostly by women. One male respondent from ward 2 gave the following remark:

"*Women are doing home based activities like cleaning, cooking, fetching water, and taking care of the children and men are responsible in making sure they provide food for the family and other needs like clothes and money for house rent. It is a shame for a man like me to wash dishes or clothes while I have a wife…. I am doing farming activities and my wife remains at home doing her home-based activities, and sometimes she used to take our farm produce and go to sale them to the streets ". [Ward 1 males; position: 20-20]*

The findings on household gender roles are presented in table 9. The respondents were asked to indicate which household roles are mostly done by men, women and or are done jointly. Apart from decision making (about 57.8%) and controlling the discipline of the children (about 56%), which are done jointly by couples in the study areas, most of the activities are performed by women. Other work like cooking (89.4%), cleaning the house (80.6), and taking children to school and hospitals (76%) were mostly done by women. However, the study identified that the role of providing basic needs like food and shelter (financial provision) were mostly done by males in the study area. The male's provision of food accounted for about 62.2%, and provision of clothing and shelter accounted for about 58.6% (table 9).

Home-based activities such as cooking, washing of clothes, taking care of children and general household cleaning are done mostly by women, while men are more involved in the provision (financial wise) of food and shelter. A study conducted in Accra, Ghana, on gender and urban agriculture revealed that most home-based activities were to a large extent done by females. The only home-based responsibilities undertaken jointly by parents in Accra was disciplining children and providing clothing, while the remaining responsibilities were on the shoulders of females (Danso et al., 2003).

Table 9: Distribution of roles by gender in household level

Home-based activities responses %			
Roles	**Males**	**Females**	**Jointly**
Cooking	2.1	89.4	8.5
Cleaning	1.0	80.6	18.4
Taking children to school and hospital	6.7	76.7	16.6
Decision making	31.8	10.4	57.8
Disciplining the children	7.5	36.5	56
Providing shelter	58.3	14.8	26.9
Providing clothes	58.6	13.7	27.7
Providing food	62.2	15	22.8

Source: Field survey, 2018 (*Based on multiple responses)

Moreover, the analysis considered the separation of farm activities of men and women in the study area. Information on involvement in agricultural activities among study participants is presented in table 10. The table also shows the relative risk (RR) and 95 % confidence intervals as a measure of the association between gender and involvement in agricultural activities.

Overall, most agricultural activities that participants were involved in were dividing the profit (92.2%), harvesting (90.4%) and planting (89.9%). Other activities were land preparation (80.3%), followed by land resource ownership (62.9%). It was noted that males were significantly more likely to be involved in land resource ownership than females (RR=2.56, 95% CI= [2.14, 3.06]): Thus, males were almost 3 times more likely to be involved in land resource ownership. Lambrecht et al. (2017) revealed that women have limited access to land and lose out when land becomes more commercialized. Those findings match the findings in this study, as more males have opportunity to own land resources than their female counterparts.

Other activities where males were significantly more prevalent were land preparation (RR = 1.23, 95% CI = [1.12, 1.36]), fertilizer application (RR = 1.12, 95% CI = [1.02, 1.21]), and weeding and pest control (RR = 1.09, 95% CI = [1.01, 1.17]). In the study area, most female farmers employed hired labour for

land preparation, while more than 80% of male farmers prepared the land by themselves. Land preparation is done manually and needs a lot of energy, which some of female farmers were not able to do by themselves. The study conducted by Danso et al. (2003) also showed that about half of the women farmers usually employed hired labour for land preparation.

However, no significant gender difference was observed in planting (RR = 0.98, 95% CI = [0.92, 1.05]), harvesting (RR = 0.95, 95%CI = [0.89, 1.02]), deciding what to plant (RR = 1.05, 95% CI = [0.98, 1.12]), and dividing the profit (RR = 1.02, 95% CI = [2.14, 3.06]). Oyegbami and Lawal (2017) conducted a study in Oyo state in Nigeria, in which harvesting of crops, planting, and land clearing were found to be done mostly by male farmers, while female respondents were very much involved in marketing, processing and storage of agricultural produce. This is not in line with the findings in this study, as both males and females were equally involved in the planting and harvesting of crops. In the study area, most of the crops are sold directly from the farm, and the traders (market sellers) supply themselves from the farm. One of the farmers in focus-group discussions gave the following comment: -

"Most of the time we used to sale our products direct from farm, it happens rarely to go to the market especially when we have a lot of agricultural produce and the customers are few is where we take our products to the local market."[Ward 5; position: 60-60]

The study by Robertson (2013) revealed that both men and women were dealing with deciding what to plant, while the planting was mostly done by women. The study also showed that men and women jointly divided the profit obtained from farming activities. The same situation was observed in the study area, as both men and women decided what to plant and divided the profit jointly.

From the conceptual framework, gender roles are among the factors influencing male and female participation in agriculture. The roles are clearly visible in the households of the UPA farmers. As women are dominating UPA activities in the study area, they sometimes control the day-to-day activities of

farming as the owner of the activity. However, some of the women complained that their work in UPA is affected a lot by their other roles at home, as they have too much to do in the house. This means that women participants have to balance between family and farming. The situation shows that women could be more effective in farming activities if they were to share some of the household activities with their husbands. Therefore, gender roles seem to be negatively influencing the achievements of women participants in UPA, as they could be spending more time in their farms, and thus producing higher yields, which would provide the capability sets for sustainable livelihoods.

Table 10: Gender differences in involvement of agricultural activities (N=386)

Agricultural activities	**All N (%)**	**Male N=173 N (%)**	**Female N = 213 (%)**	**Relative Risk (RR)**	**95 %CI**
Land preparation	310(80.31)	155(89.60)	155(72.77)	**1.23**	[1.12,1.36]
Watering the garden	316(81.87)	144(83.24)	172(80.75)	1.03	[0.95,1.13]
Fertilizer application	324(83.94)	154(89.02)	170(79.81)	**1.12**	[1.02,1.21]
Weeding and pest control	333(86.27)	156(90.17)	177(83.10)	**1.09**	[1.01,1.17]
Planting	347(89.9)	154(89.02)	193(90.61)	0.98	[0.92,1.05]
Harvesting	349(90.41)	152(87.86)	197(92.49)	0.95	[0.89,1.02]
Deciding what to plant	344(89.12)	158(91.33)	186(87.32)	1.05	[0.98,1.12]
Dividing the profit	356(92.23)	161(93.06)	195(91.55)	1.02	[0.96,1.08]
Land resource ownership	243(62.95)	164(94.80)	79(37.09)	**2.56**	[2.14,3.06]

Source: Field Survey, 2018 (Based on multiple responses

4.5 Summary of the Chapter

This chapter described the demographic characteristics of respondents in the study area, which included age, gender, education, marital status, and size of the households. The chapter also described the UPA practices in the study area, which revealed that farming activities in the study area is not permanent, but people keep on moving due to problems with the supply of land. Vegetables were found to be the most-grown crops in the study area. The extent of men's and women's participation in UPA was also analysed in this chapter. It was found that more females engaged in faming activities than males. Gender roles in agricultural activities were described and showed that men and women conduct their farming in different ways in land preparation, planting, harvesting, and deciding what to plant. The findings also revealed that most men and women who participated in UPA in the study area are migrants from different parts of Tanzania and have rural backgrounds.

The study showed that in the study area, gender roles have changed in an unbalanced way, due to economic difficulties and technological changes. On the extent of men's and women's participation in UPA, the study described the activities of the participants based on gender. It was found that males participate highly in land ownership and farm preparation, while women farmers used hired labourers to prepare land for them. No significant gender difference was observed in planting, harvesting, deciding what to plant, and dividing the profit.

CHAPTER FIVE

FACTORS FOR MEN'S AND WOMEN'S PARTICIPATION IN UPA

5.1 Introduction

This chapter analyses and presents the driving factors for men and women to participate in UPA. The relationship between UPA and the achieved sustainable livelihoods is influenced by different transformed factors. The results in this chapter are divided into socio-cultural, economic, ecological and institutional factors. The study, through in-depth interviews, focus-group discussions and questionnaires revealed several factors influencing men and women to participate in UPA in the Kinondoni municipality. The factors lead to the presence of various capability sets, which will help a person to live a certain kind of life for the attainment of sustainable livelihoods. The ratio of women and men participating in UPA due to various influencing factors varies in the study area.

5.2 Factors influencing men's and women's participation in UPA

Men and women in the study area were persuaded by various factors to participate in UPA. The strength of the factors for their participation differed between men and women. Figure 13 indicates that women were more influenced by many factors than men. The factors are discussed in connection to the capability theory operationalized in this study. The economic, socio-cultural, and ecological factors are the most influential factors for both men's and women's participation in UPA in order to achieve the capability sets needed for sustainable livelihoods.

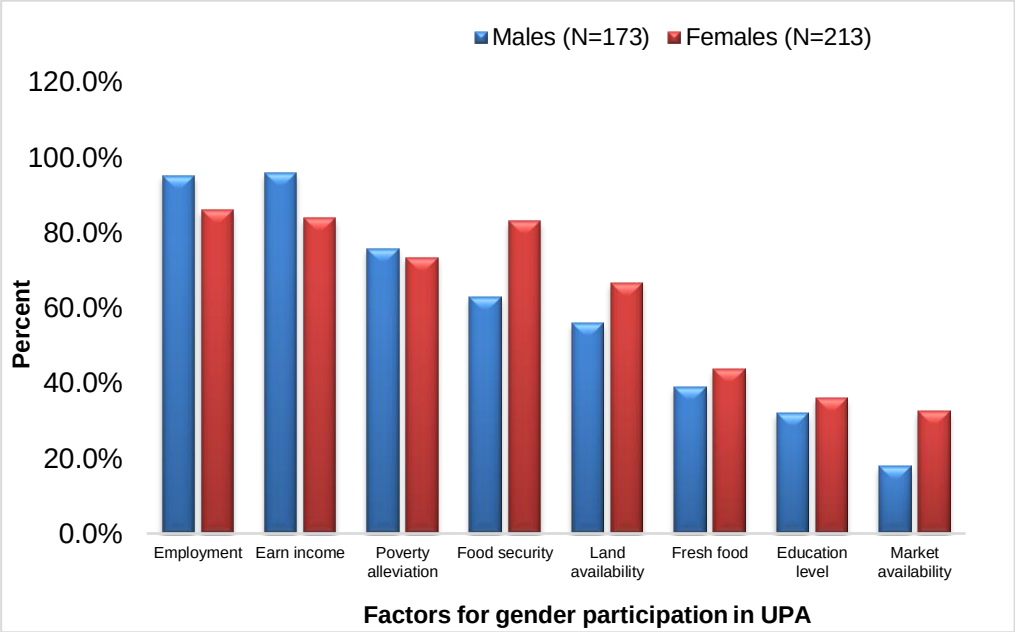

Figure 13: Factors for men's and women's participation in UPA
Source: Field survey, 2018 (Based on multiple responses)

5.2.1 Economic factors

Employment, earning income and market availability were the economic factors most mentioned to influence men and women participation in UPA in the study area. The employment factor was mentioned by most of the respondents to influence their participation in UPA and was pointed out by 83.4 % of respondents. The largest portion of persons who engage in farming activities in the study area do not have formal employment, which is why they decided to engage themselves in agriculture. About 95.2% of all men participating in UPA claimed to be influenced by lack of employment, while 85.9% of all women were said to be influenced by the same factor. Therefore, more men were influenced by lack of employment to participate in UPA than women (figure 13). One of the respondents from ward 1 said that:

"*Based on daily responsibilities and the unemployment problem, most of us have been forced by the situation to engage in agricultural activities to earn money and food for sustaining our life. You know…to conduct agriculture does not need a high amount of capital, it just needs to have space, seeds and water, and there is the matter of physical energy. We use the income from agricultural*

activities to support the schooling of our children, to meet medical services and sometimes to pay for our house rents". [Ward 4; Position: 45-45]

Also, the extension officer from ward 2 insisted that unemployment has forced many people to be involved in UPA. On her side, she said that:

"The economic reasons like lack of employment and life difficulties are big reasons that make people continue turning to farming activities, regardless of the challenges they are facing. Poor people in the city are doing farming activities in order to get food and sell some of their crops to get money that will help them to sustain their life. So, I can say that economic hardship forces people to involve themselves in UPA, especially poor people" [Agricultural Officer 2; Position: 37-37]

Retirement was the least among the economic factors for men's and women's participation in UPA. It was pointed out by only 20.2% of the respondents. The retired people in the study area decided to engage in farming activities after their retirement, in order to fill the need of the household. In the study area there were not many retired persons who engaged in UPA. Most of the retired people who participated in farming activities in the study area were farming for the purpose of getting food. One of the retired persons in ward 5 said that:

"For me I am cultivating in order to get food, I like to eat the food that has been cultivated by me. As longer as I have my own land, I decided to use it for cultivation. Also, sometimes I take it as an exercise for my physical body. But sometimes I used to sell the surplus and get income for several uses…not always". [Ward 5; position: 46-46]

The literature shows that many people in urban areas become involved in UPA because they do not have formal employment that would help them to earn income for their personal and families' daily basic needs (Bishoge et al., 2017; Sithole, 2008; Nzimande, 2013). Employment is the tool for income generation. Most cities in African countries are facing difficulties coping with developments and are unable to create sufficient formal employment opportunities for the poor. In the absence of formal jobs in many African cities, urban people found UPA as an alternative activity (Simiyu, 2012; Bishoge et al., 2017). UPA is

increasingly becoming an important source of employment for people who may not successfully compete for formal-sector jobs (Zezza and Tasciotti, 2010; Cofie et al., 2003). Also, UPA creates job opportunities for both the retired, the unemployed and even employed (Nzimande, 2013).

In this study, lack of employment was found to be an influential factor for men and women to participate in UPA as the source of obtaining the needed capability sets such as income (financial capital) and food (food security). The presence of income and food to the farmers helps them to choose the kind of life they wanted to live and value.

However, to earn income was among the influential factors for men and women in the study area to participate in UPA. Males and females found UPA to be a means for getting money that helps them to handle their livelihood and their socio-economic development. When farmers sell the surplus from their agricultural products, they earn income that helps them cover some of the costs, including house rents, buying clothing, paying school fees and transport fares for their children. Other farmers who earn more income and also develop their settlements by building new houses. The study conducted in Dar es Salaam city by Bishoge et al. (2017) showed that all respondents were involved in urban agriculture (horticulture) to earn income for their personal and families' daily basic needs. They get money that helps them handle their livelihood and their socio-economic development.

Income generation helps to bring up the capability sets responsible for sustainable livelihoods. In the study area, about 73.3% of all respondents participated in UPA for the purpose of generating income. Before they decided to engage in farming activities, they were spending a lot of their income on food, making them very vulnerable to higher food prices. In that case, they expected UPA to provide food and creating savings by reducing household expenditure on food, thus increasing the amount of income allocated to other uses. The sale of UPA surpluses in local markets, generating more income for the UPA farmers. Income is able to provide other capability sets such as physical health, education, access to land, and food security, which are very important for

sustainable livelihoods. For that reason, men and women decided to participate in UPA so as to get the capability sets for sustainable livelihoods.

Market availability of agricultural produce influenced men and women in the study area to participate in UPA as they have an assurance of selling their products after the harvest. One of the respondents from ward four had this to say:

"I was doing business of vegetables in the streets…I used to buy vegetables from farmers and sometimes from the local market at Tegeta. I found that vegetables pay much, then I decided to cultivate by myself to get more profit…even though up to that moment if I do not have vegetables in my garden. I used to buy from my fellow farmers and sell in the streets. Most of the time I salel my produce by myself, I am not selling to the middlemen or other sellers unless I have too much in my garden". [Ward 4; position: 36-36]

The results indicate that market availability due to presence of many consumers of agricultural produce has motivated some farmers to sell their crops directly to the consumers, with the aim of getting more profit as described by the farmer from ward 4. Market availability of UPA produce is due to the rising demand for food in urban areas caused by the increased populations of cities. These findings concur with those from Jacobi et al. (2000), who showed that leafy vegetables are in high demand in the city of Dar es Salaam. With their short production cycle, vegetables can be grown in locations where water is not available throughout the year, where there is no long-term right to using the land, and where little space is available.

The presence of markets for UPA produces leads to the generation of income as a very important capability set for agricultural development and sustainable livelihoods. People are free to choose any kind of life they want to live with the money obtained by selling UPA products at the available market. Therefore, some people (about 32.5%) of all respondents in the study area were influenced to participate in agriculture by the presence of a ready market for UPA produce.

5.2.2 Socio-cultural factors

Most of the respondents (more than 73%) claimed they engaged in UPA in order to increase food security and nutrition for their families (figure 13). This study noted that UPA helps farmers to have their own food that saves household expenditure on food. However, the farmers were farming in the city to make sure they have enough and nutritious food for their households. Women believe that food is more important in their households. More than 80% of all women participating in UPA claimed to be involved in UPA for the purpose of ensuring household food security (figure 13). They wanted to ensure that their produce is able to contribute towards household food security. The key focus of women was on household consumption. Men, on the other hand, had a different perspective with regard to their participation in UPA agriculture. 95.3% of all men in the sample decided to participate in UPA activities in order to get money to sustain the family.

Food production for household consumption has been revealed by many studies as a leading motivational factor for men and women of different age groups to engage in UPA (Dimitri et al., 2016). Studies conducted in Buea, Cameroon and Nairobi, Kenya reported that more than 66% of urban farmers considered urban farming as a source of calories for their households (Ngome and Foeken, 2012; Gallaher et al., 2013). The review by Warren et al. (2015) showed that the motivation for urban farmers to participate in UPA was to get food for their households, particularly during the critical times, as when they do not have enough income to buy food. Simatele and Binns (2008) conducted a survey in Lusaka, Zambia and reported that 50% of the surveyed farming households confirmed that urban agriculture is a key strategy for meeting shortfalls in household food requirements. The current study has, therefore, shown that food security is a major factor that drives many women (about 83% of all women in the sample) to participate in UPA.

Furthermore, urban and peri-urban agriculture was perceived by many respondents to provide a complementary strategy to reduce urban poverty in the city of Dar es Salaam. One of the respondents in a women's focus-group

discussion admitted engaging in UPA as a way to reduce or alleviate life difficulties. She said that:

"*Life difficulties forced most of us to engage in farming activities; as we were struggling for life, we found a better way for us to get our needs is to engage in farming activities, which will help us to get something for our family like taking our children to school, getting food, and extra income for other uses." [ward 2 females; Position: 32-32]*

The researcher of this study noted that men and women who are participating in UPA are those with low income and use UPA as a viable intervention strategy for them to earn extra income to take adequate care of their basic needs like clothing, shelter and growing their own food. The finding corresponds with the studies conducted by Sithole (2008), Mkwambisi et al. (2011) and Simiyu (2012) who found that UPA is a significant strategy which contributes to local economic development and poverty alleviation by improving food security, providing employment opportunities and acting as a means to socio-economic empowerment. The studies go further by showing that UPA provides the pathway for employment and income generation of jobless men and women in cities, which is a core objective of the poverty reduction efforts. A well-coordinated and supported UPA can be used as a route to reducing urban poverty across SSA. Poverty reduction leads to the presence of the needed capability sets for sustainable livelihoods.

Also, beliefs in and preference for eating fresh food produced on their own farms influenced men's and women's participation in UPA. The findings from focus-group discussions revealed that farmers needed to eat fresh food produced by themselves, believing that self-produced food is safer than buying from the market. The following remark came from one respondent:

"On my side I decided to participate in farming activities so as get fresh vegetables from my own garden … I feel safer to eat vegetables from my garden than buying from the market. In addition, producing my own vegetables helps me not to incur costs in buying everything I want to eat from the market, and I can eat vegetables based on my preferences and favorites. I can also

give to neighbors who do not grow vegetables to use, though I sometimes sale them and get money". [Ward 5; Position: 49-49]

Many studies conducted in Africa have not mentioned the preference for fresh food to be an influential factor for men and women of different age groups to participate in UPA. Most of the literature has noted that food security, income generation, employment opportunities, political participation and social inclusion are the main factors influencing different people to participate in UPA (Sithole, 2008; Simiyu 2012; Warren et al., 2015 and Bishoge et al., 2017). Therefore, this study has revealed a preference for fresh food that influences several men and women (about 38.9% of men and 43.7% of women) in the Kinondoni municipality to engage in UPA.

In the course of conducting UPA for getting fresh food, people meet many people in the streets where they conduct farming, as people can come and ask for vegetables. By so doing, UPA increases the possibility of creating good social relationships between the farmers and the surrounding community. Social relationships are a very important capability set, as it determines a person's social network and the amount of support obtainable from the society as a means to sustainable livelihoods

However, the low level of education was one of the factors that influenced men and women of different age groups to participate in farming activities in the study area. For example, most of the respondents in the study area (more than 80%) had primary or below-primary education, and hence difficulties to be employed in government and non-government offices. One of the respondents from a focus-group discussion in ward 5 claimed that his low level of education had influenced him to engage in farming activities because there was no way for getting employment.

"For my side the level of education caused me to participate in farming activities. To get employment in government or non-governmental sectors you are supposed to have a certain level of education. When I came to the city for the first time, I was looking for employment…I ended on getting work of caring for peoples' livestock and farms. Therefore, I see the employed people in

paying jobs are those with education. For my low education I decided to engage in other activities including farming my own farm and small businesses in the streets instead of doing it for somebody else". [Ward 3; Position: 37-37]

The study by Bishoge et al. (2017) also revealed that the growth of UPA is associated with the notion of having a low education. Engaging in UPA helped to pull the respondents away from involvement in social crimes like pick-pocketing, drug abuse and robbery. Therefore, the influence of socio-cultural factors in the participation in UPA in the study area has the elements of providing several capability sets needed for sustainable livelihoods. Financial capital, food security, social relations, physical health and education are provided through the participation in UPA, hence also sustainable livelihoods.

5.2.3 Ecological factors

Ecological factors such as good climatic conditions, fertile land, and water availability are very important for the development of agricultural production. Most of the respondents, more than 55% in the study area said that their participation in UPA was influenced by the presence of land for farming. In Mabwepande ward, about 89.3% of the farmers were the victims of the flood of 2011, whose settlements were located in the Msimbazi river valley, particularly Kinondoni Mkwajuni and Jangwani. The government evacuated them and gave them free planned plots for settlement. At that time, the Mabwepande ward was empty, with no houses, so people decided to start cultivating the available land due to life difficulties in the new area, as there was not even a market to buy vegetables. In the questionnaires-based survey, one of the respondents from ward 3 said this:

"Before coming here I was living at Kariakoo area along Msimbazi river valley, my house was submerged in floods during the heavy rain in 2011. I was just doing petty trades in the streets before the floods. The government decided to give us the surveyed plots here in Mabwepande to rescue our life. Life here was very difficult because we had nothing to do to earn income. I decided to start to cultivate vegetables near this dam, now I am getting income and food for my family". [Ward 5; Position: 45-45]

The study revealed that men and women found the availability of open and undeveloped land as an opportunity for them to engage in farming activities to improve their livelihoods. These study findings are in line with Bishoge (2017), who showed that the availability of open spaces influenced many people (about 93%) to participation in urban and peri-urban agriculture in the city of Dar es Salaam. The areas reserved for further road construction have been used by UPA farmers to cultivate vegetables and, in some areas, flowers and ornamental plants. In the study area, urban and peri-urban farmers used open spaces like road reserves, river valleys and undeveloped areas owned by organisations or individuals; for example, the areas owned by TBC and Daily News are used by UPA farmers in Wazo and Kunduchi wards.

Most of the open spaces stretch along rivers and water drains. Occasionally, shallow wells and legally or illegally tapped water are alternative water sources. Open spaces are cultivated by more than one farmer, mainly from low- and medium-income groups. The farmers do not necessarily work together as a group. Producers on one open space sometime tend to come from the same tribe, but various tribes can be found in this business (Jacobi et al., 2000).

5.2.4 Institutional factors

In the study area, institutional factors were found to be dormant in such ways that do not restrict and do not facilitate UPA in the study area. Tanzanian urban and peri-urban agriculture is well represented in official policies. In the national Agricultural policy of 2013, the presence and significance of UPA is identified and recognized. The policy states that UPA is a vital aspect of food security and employment creation, for broadening the tax base, and beautification of cities, and serves as a supplementary source of income of the urban dwellers (URT, 2013). In addition, the National Land Policy of 1997 supports UPA and maintains that the government has to institute proper infrastructure to mitigate land degradation and water pollution, safeguard public health, and reduce hazards in areas where UPA is allowed (URT, 1997). The Land Act of 1999 No.4, the Urban Planning Act of 2006, and the Land Use Planning Act of 2006 allow relevant authorities to designate land and create measures for allocating and actuating land for urban farming.

The National Human Settlements Development Policy of 2000 recognized the presence and value of UPA as an economic activity, as well as a land use. The policy compels the government to nominate special areas for agriculture within planned areas in cities. The farmers can be granted legal rights to use the areas for agricultural activities and to facilitate planned agriculture in the cities.

Despite strong policies designated to support the existence of UPA at the national level, and stipulation by the Dar es Salaam City Council on the use of land for UPA in its development agenda, there are no areas that are officially demarcated for UPA activities in the city of Dar es Salaam (Mlozi et al., 2014). This is driven by the notion that UPA is an informal and thus uncontrolled practice. In addition, planning institutions in the local and central government are reluctant to include UPA in their land-use plans despite policy directives (Schmidt, 2012; Halloran and Magid, 2013). Urban planning officials have not taken steps to put UPA into their master plans or put special conditions on its treatment. Overcoming these policy barriers and biases is critical to creating a more sustainable pathway for UPA (Mlozi et al, 2014).

5.3 Summary of the chapter

The results in this chapter showed the influence of economic, socio-cultural and ecological factors. Institutional factors were found to be inactive in the study area. The study results showed that the motivational factors for male and female participation in UPA in the study area are unemployment, income generation, market availability, food security, availability of land, level of education, and preference for fresh food. Unemployment, income generation, food security and poverty alleviations were leading in influencing both men and women in the study area to engage in farming activities.

The economic, socio-cultural and ecological factors are directly linked to the capability sets that are needed to attain sustainable agriculture and livelihoods. The factors discussed in this chapter can influence how a person can convert the characteristics of an activity (UPA) into the required capabilities for sustainable livelihoods.

CHAPTER SIX

THE SOCIO-ECONOMIC CONTRIBUTION OF UPA

The socio-economic effects of UPA resulting from the different roles of men and women in the study area are dealt with in this chapter. Using the capability approach framework, UPA contribution to socio-economic development in this study are considered to be the capability sets and their related outcomes. The capability sets refer to those opportunities available for people in order for them to make choices on the kind of life they want to live for better outcomes (Sithole, 2008). It is important to note in this study that there is a very thin line between capability sets provided by UPA and the achieved outcomes in livelihoods. In this analysis, capability sets are opportunities, which determine the choices UPA farmers have, and thus the kind of life that they eventually lead, the herein achieved sustainable livelihoods. UPA is considered as a good or resource to most of the people in the study area who depend on UPA as the only source of their livelihood. There are many capability sets that are now available to UPA farmers. This study analysed those sets, ranking them according to the importance they have to the urban farmers. Through focus-group discussions, questionnaires and in-depth interviews it was found that UPA had many capability sets for the socio-economic development of households in the study area. Table 11 represents farmer's responses through questionnaires on the capability sets and the achieved outcomes.

Table 11: Capability sets and achieved outcomes

Benefits	Ranking	Bunju (%)	Kunduchi (%)	Mabwepande (%)	Mzimuni (%)	Wazo (%)	Total (%)
Food security	i	30.5	10.9	26.2	7.3	24.6	**99.5**
Financial capital	ii	23.6	10.1	15.5	7	16.1	**72.3**
Social relation	iii	20	7.8	19.2	4.6	17.8	**69.4**
Physical health	iv	22.3	2.1	14.5	6.4	16.1	**61.4**
Buy clothes	v	21	1.3	13	6.2	15	**56.5**
Education/knowledge	vi	15	9	11.4	3.8	9.8	**49.0**
Improved settlement	vii	11.1	7.8	9.6	2.6	9.1	**40.2**
Transport facilities	viii	5.2	0.7	3.4	0.3	5.4	**15.0**

Source: Field survey, 2019 (Based on multiple responses)

6.1 The Capability Sets

The findings revealed that UPA has a great contribution to the socio-economic development of the people in the study area through its provision of the needed capability sets for sustainable/quality livelihoods. Physical health, financial capital, education, and food security together with social relations are the capability sets provided by UPA and that lead to socio-economic development in the study area (table 11). The socio-economic outcomes shown to be related to the provided capability sets obtained from UPA were; improved food security, health, improved settlements, and social relations. Also, UPA gives people an opportunity to earn income, get quality education, and buy clothing and transport facilities for quality livelihoods.

6.1.1 Food security

At the household level, food security refers to the ability of the household to secure adequate food for meeting the dietary needs of all members of the household, either from its own production or through purchases (FAO, 2008). Most of the respondents (99.5%) in the study area revealed that urban and peri-urban agriculture has helped them to improve food security in their households. UPA have helped farmers to have physical access to food,

particularly vegetables, and leads to food self-reliance. Fresh vegetables provide the farmers' households with a much-needed diversified diet. In addition, farmers are selling part of their farming products and being able to purchase other food products that they themselves could not produce, as their primary purpose of farming is to get food and income.

The study conducted by Masashua et al. (2009) in Kinondoni municipality revealed UPA to make a significant contribution to the food security of many people in the cities, both as an important component of the urban food system and as a means for vulnerable groups to minimize their food-insecurity problems. Production of some food crops like vegetables, maize and fruits help the farmers to cut the cost of purchasing them and use the available financial resources to purchase other food products that they are not producing (Sithole, 2008).

Food security is also a root component of the human development and capability ideal, since food access and entitlements are critical for reinforcing essential human capabilities. Agriculture is considered as a cornerstone for improving food security and reducing poverty in Africa (Conceição et al., 2016). The presence of enough and nutritious food in society makes men and women capable of carrying out developmental activities for sustainable livelihoods. UPA in the study area was found to provide farmers a better choice of the kind of food available to them. They are able to choose different types of food products, as these are generally available and accessible to the farmers.

6.1.2 Income generation

Income generation is one of the most important capability set that is provided by UPA in the study area. Most of the farmers in the sample (about 72.3%) of all respondents agreed that they were able to produce enough agricultural products and sell the surplus that helped them to get income. One of the factors motivating men and women to participate in UPA is income earning, and they were generating a reasonable income from UPA. Farming activities have become an engine for money earning, even though some of the farmers have other sources of income. The farmers in the study area were able to generate

an average of up to 215,645 Tanzanian shillings per month during harvesting time, especially for those who were cultivating watermelon and tomatoes. The minimum income for those who were selling their surplus and had very small plots of less than 0.1 hectares was 50,000 shillings per month.

The study revealed that crop production makes a positive contribution to the income of UPA farmers in the study area. Figure 14 presents the analysis of the farmers who sold their agricultural products. Most of the farmers - about 142 (52.2%) of the respondents - who were selling their crops admitted to earning between 50,000 to 200,000 Tanzanian shillings per month and 62 (22.8%) earned between 210,000 to 300,000 shillings per month. Moreover, 18 (6.6%) earned between 510,000 to 1,000,000 shillings per month, while 13 (5.2%) earned above 3,000,000 shillings. The earnings ranged between 21.69 U.S.$ and 1,300 U.S.$ per month. The selling of UPA produce led to income availability that resulted into various choices that farmers are enjoying in the study area. Farmers use the income from UPA differently in making choices to sustain their life. For example, one farmer from ward one had the following comments:

"On my side, I have planned to save money I got from agricultural production for the aim of buying a bakery for cake backing. I am about to do it." [Ward 1 Males; Position: 51-51]

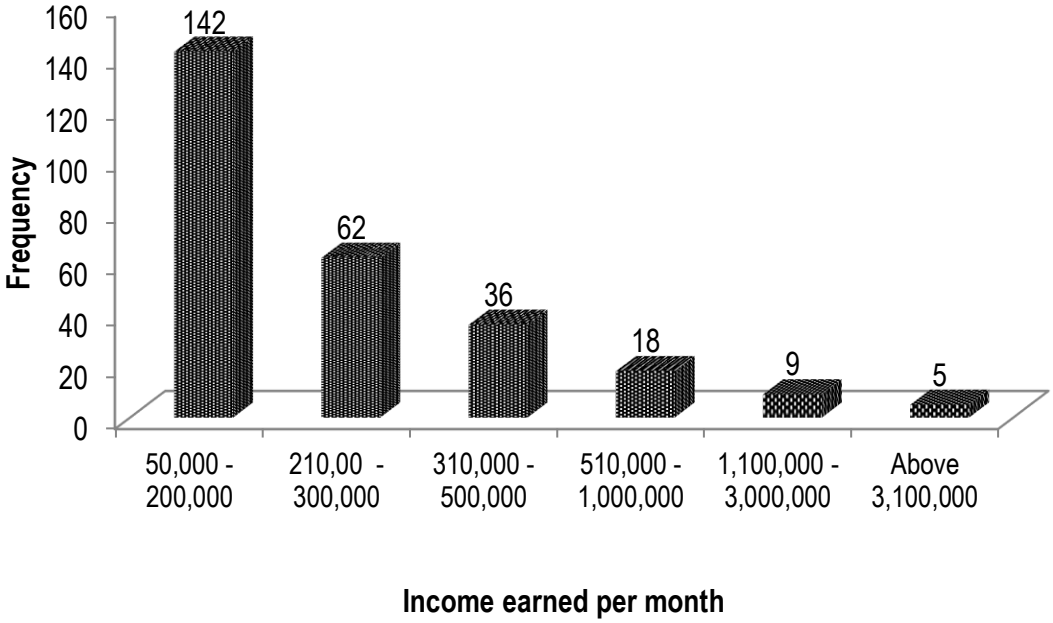

Figure 13: Earned Income from UPA (Tanzanian shillings).
Source: Field survey, 208

Moreover, Kinkese and Pride (2017) and Smart (2015) reported that urban agriculture provides a source of income through the sale of urban-produced crops. Income generation is the most significant benefit of urban farming among the urban poor, because most of them have low expendable income and other assets. The urban poor lack formal employment or any small business that can supplement household income for other services required by the household. Therefore, by participating in UPA activities, men and women obtain an income which give them the freedom to choose the type of life they have to value.

6.1.3 Social capital

Social capital involves the connections in the community: the way in which people interact and relate to each other (Kanosvamhira and Tevera, 2019). UPA has helped the farmers to build good social relationships in the community in which they are living. About 69.4% agreed with this statement. The study revealed that UPA has empowered farmers to have free and strong

associations with other members in their society. The study shows that UPA farmers are the persons who support the life of many people in the city through the provision of food from their farming activities. This had made some of the farmers become more influential people in the society, and that helped them even to participate in political issues, as people have trust in them. One respondent from ward 3 has been selected to be a street leader, because he became well known after he began to cultivate vegetables in his area. In addition, UPA in the study area has helped some of the farmers to have strong social relationships among themselves and in the surrounding community.

This study described social relationships among the farmers as affectionate, and most thought that there was trust and willingness to share information; that is a powerful weapon contributing to their success in farming activities. UPA serves to empower farmers' groups through the formation of social networks and the building of human and social capital. UPA was shown to build social networks and social support to the farmers (Doherty, 2015; Sithole, 2008). The current study shows that UPA not only contributes to food security and financial capital, but also builds social capital, which improves livelihood strategies and interpersonal relations (Gallaher et al., 2013).

Social capital is an abstract concept rather than a firm, tangible object. The idea of social capital is rooted in the notion of trusts, norms, and informal networks (Siisiäinen, 2003). Social capital is similar to other forms of capital, in the sense that it can be invested with expected future returns, can be converted, and is appropriate, but also requires maintenance. Social capital is considered to be an intricate aspect, encompassing a stock of social norms, values, beliefs, trusts, and obligations, relationships, networks, friends, memberships, civic engagement, information flows, and institutions that foster cooperation. Collective action contributes to socio-economic development (Bhandari and Yasunobu, 2009).

6.1.4 Physical health

Farmers have perceived UPA as a means to improving health of people in the study area. About 61.4% of the respondents said that through UPA their health

has improved. UPA has created space for farmer's households to have access to fresh, healthier, and nutritious food from their farms. The households get fresh vegetables and fruits from the farms, which is very important for their health. In addition, the farmers use the income obtained from UPA to pay for health services when they fall sick.

Health services are one of the choices that are enjoyed by UPA farmers in the study area using the obtained income through selling UPA products. UPA farmers highlighted that the money they get from UPA can help them to afford to get better medical treatment for their families when the need arises. One farmer in a focus-group discussion argued that:

"Sometimes I used the obtained money from UPA to pay for health services of my family members and I provide my family with fresh and healthier food required for their health development. [Ward 2 Females; Position: 34-34].

Having a healthy physical, mental and psychological condition helps people do whatever they want to do for the improvement of their livelihoods. The results from this study concur with the findings of the study conducted in Bulawayo-Zimbabwe by Sithole (2008), who reported that food availability and access seem to have also boosted the psychological health among the farmers, as the farmers interviewed reported less mental stress and were generally happy. To the people who are participating in agricultural activities, improved physical health is among the most tangible benefits of UPA, as they are getting more nutritious food from their gardens (Doherty, 2015). Health is valued in its own right and is known as the measure of the body's efficiency and overall well-being. Health improvement can have effects on utility, efficiency, productivity, income and has, ultimately, effects on economic growth. Therefore, good health has a positive and significant effect on economic advancement (Pourreza et al., 2017).

6.1.5 Education and knowledge

Education is among the capability sets farmers acquired as a result of their participation in UPA. Most of the respondents in the study area already had some form of education; the majority had only primary education. However, in

the involvement to UPA activities, farmers are exposed to technical education and skills. For example, every year representatives from different farming groups in Dar es Salaam city are selected to participate in national agricultural exhibitions that have increased their knowledge and their performance in agricultural activities. Also, Kinondoni municipality used to conduct farmers' training for those from different parts of the city and from the country at large. The municipal agricultural officer had the following to say:

"Most of our effort is to ensure that we provide education, training and advice required by farmers. We have ensured that all the farmers in town are well supported through training and other various techniques of cultivation that supports urban agriculture. For example, the town/city planners have allocated an area for farmers to get agricultural education and training at Malolo area in Mabwepande Ward. It is like a college where agricultural education and training is carried out and it gets support from the Kinondoni municipality." [Municipal agricultural officer; Position: 58-58;]

Many farmers are trained in various ways of conducting sustainable agriculture at Malolo Agricultural Resource Center (MARC) located at Mabwepande ward (plate 3). In addition, UPA has contributed to the improvement of education provided to the household members in the study area. Farmers have access to the education facilities needed by their children. About 49% of the respondents revealed that UPA had helped them to improve the education of their household members.

	
Malolo Agricultural resource center (MARC)	**Farmers training at MARC**

Plate 3: Malolo agricultural resource center located in Mabwepande ward
Source: Field survey, 2018

6.2 Achieved outcomes

Because there is a very thin line between the capability sets and the obtained outcomes, in most cases capability sets also turn out to be achieved outcomes (Robeyns, 2005). People will be in the position to choose type of life they want to live, depending on the available opportunities (capability sets). This study analysed the achieved outcomes in relation to the capability sets discussed above. Farmers acquired several socio-economic outcomes that emanated from the available capability sets, that include: income, physical health, food security, social relations, and improved education. The achieved outcomes are analysed under the available capability sets.

6.2.1 Income related outcomes

The study showed that farmers were able to provide basic needs for their families like clothing and quality education, and to improve their settlements using the income generated through UPA. The capability set of income generation provided by UPA has helped the farmers in the study area to change their life positively. More than 56% of the respondents in the study area

admitted using the obtained income from UPA activities to provide the needs of clothing for their households. One of the respondents in the questionnaire survey explained that:

"In general, I can say, urban agriculture has improved my life. It has changed my life from dependent to independent life in such a way that I can fulfil my daily needs without depending on someone else. Before I started to engage in farming activities…I was living a sad life because my husband was not able to provide everything I need because of the limited income he has. But now my children can eat, I can buy clothes for them and for myself, and I manage to pay school fees and do many other small things without waiting for my husband to provide." [A farmer from Mabwepande ward,27/07/2018]

Most of UPA farmers (about 49%) have managed to improve the quality of education of their children by being able to provide the school requirements for their children. The income obtained has helped farmers to pay for school fees for their children, to buy school materials such as uniforms and exercise books and pay money for bus fares. Through a focus-group discussion, it was also found that UPA has empowered even those women who were suffering because their husbands were not providing important needs for their households. The life of women who participate in UPA has changed, and they are able to provide support to their family even if their husbands are also providing income for the household. They can now manage to provide by themselves. One of the respondents from a female focus-group discussion had this to say:

"There are some changes since I started to cultivate crops…! Because in previous I was very dependant to my husband but now days I am struggling for the provision of my family...I am no longer a dependant." [Ward 2 Females; Position: 36-36]

Apart from getting quality education and other basic needs for their households, UPA has also helped some of the farmers to improve their settlements in the study area. About 40.2% of farmers said that they have improved their settlements through UPA. Some farmers have managed to buy plots and build

new houses, others are in the process of building their own houses on the acquired plots, while yet others have managed to get money to pay for their house rents. One of the participants in the focus-group discussions commented that:

"Most of the benefit is getting food for our families and some few other things like clothes and having money to pay for health services. It also depends…if you have a big farm you can achieve more other things like building a house, buying a car and do other developmental things. We have a good example of our fellow urban farmers who have managed to build a nice house through urban agriculture." [Ward 2 females; position: 34-34]

However, few respondents (15%) from the study area mentioned that they have managed to buy transport facilities like motorcycles and bicycles using the money obtained from UPA, and thus simplify their mobility. Studies conducted in the cities of Zambia reported that the economic benefits brought about by UPA are economic effects on food, source of income and source of employment. Households harvest and eat some vegetables from their fields rather than going to buy them from the market. The food produced from the urban farms is consumed within their homes, thereby reducing the amount of money required to buy household food. As a result, the money saved from buying food is diverted to other household services like clothing, shelter, health, and education (Kinkese and Pride, 2017; Simatele and Binns, 2008 and Smart, 2015). The income generated from UPA plays a vital role for the poor to purchase other required household services, and even the improvement of their settlements (Simatele, and Binns, 2008).

6.2.2 Food security related outcomes

The presence of enough and nutritious food in the society makes men and women capable of carrying out developmental activities for sustainable livelihoods. UPA in the study area was found to provide farmers a better choice of the kind of food available to them. They can choose different types of food products, as these are generally available and accessible to the farmers. By so doing, they have benefitted from getting nutritious food from their products,

which has improved their health. Farmers are free and able to do farming activities without any problem because they are healthier and energetic due to the presence of enough and nutritious food they take from their farms.

Food security not only carries significant benefits for human health, but also serves as the basis to achieve sustainable economic advancement (Pourreza et al., 2017). Farmers in the study area were shown to have better choice of food, as they can choose different types of food they need for their consumption. UPA in the study area is playing the role of complementing rural agriculture and increased the efficiency of food systems in the city, as it provides products that rural agriculture cannot easily supply, like perishable products (Bon et al., 2010). Also, the availability of surplus food has provided the farmers with an income which is used to cover various needs in their households. Farmers are getting fresh, healthier and nutritious food from their farms that strengthen their health together with the money for their economic development. Bouis et al. (2013) showed that good nutrition is the foundation for human health and well-being, for physical and cognitive development and economic productivity. Food is a basic human right.

6.2.3 Social relations related outcomes

UPA in the study area has helped the farmers to have strong social relationships among themselves and the surrounding community. UPA has improved social relations of many farmers in the area they are cultivating and, in their communities, at large. It can be argued that the UPA has empowered farmers to associate freely with other members of the society. One of the respondents in a focus-group discussion gave the following explanations on the improvement of social relations:

“Farming activities has built more confidence and respect in my society...people used to call me asking for vegetables to buy and sometimes they borrow money from me which was not possible before. Therefore, I am acting as community vegetable supplier. Through vegetable production I have built a good social network in the community with many friends in the streets and people have trust in me…." [Ward 2 Females; Position: 35-35]

Farmers have built trust among themselves and a willingness to share information. They were able to form farmer groups in which they share information, agricultural facilities such as pumped water for irrigation, and to conduct some agricultural activities together. Examples of farmer's groups found in the study area are a New hope group, a Drive-in group, and an Organic-farming group. These groups are organized and conduct farming activities together. For example, an organic-farming group at the Kunduchi ward in Pwani Street cultivates the land provided to them by Kinondoni municipality. The groups formulated by farmers in the study area have helped the farmers to take responsibility for their own development in their communities. The study by Jacobs and Xaba (2008) described that strengthening farmers' organizations is one strategy to build internal cohesion and support, and to create a structure through which their needs can be articulated. However, the discussed capability sets provided by UPA in the study area have managed to change the life of many farmers in a positive way. But due to the challenges facing UPA the major being pest and diseases and land access and availability, farmers have not yet reached to the point of living the life they desired.

6.3 Prevalence of sustainable livelihood in the study area

As described in the methods section, the livelihood index was created based on 8 items concerning the benefits obtained through UPA. The median livelihood index was 4, and overall, 49% of the respondents had sustainable livelihoods, as they were able to obtain more than four (4) out of eight (8) benefits provided by UPA (Figure 14). Drawing on Chambers and Conway (1992), Scoones (1998) defined a livelihood as something that comprises the capabilities, assets (both material and social resources), and activities required for a means of living. In this study, livelihood is considered as a means of securing the basic needs of life such as food, shelter, clothing, and education, not forgetting health services. It is a set of activities essential to everyday life that people need over their whole life span. And a livelihood is said to be sustainable when it can cope with, and recover from, stresses and shocks, and maintain or enhance its capabilities and assets, while not undermining the natural resource base (Krantz, 2001; Petersen and Pedersen, 2010). For this

study there were eight benefits farmers obtained from farming activities. A farmer was considered to have a sustainable livelihood if he/she was able to obtain more than four of the benefits provided by UPA. The prevalence of sustainable livelihoods in the study area has a direct link with the available capability sets provided by UPA. The available capability sets facilitated the farmers having the related outcomes, which gave them the freedom to choose the life they wanted to live.

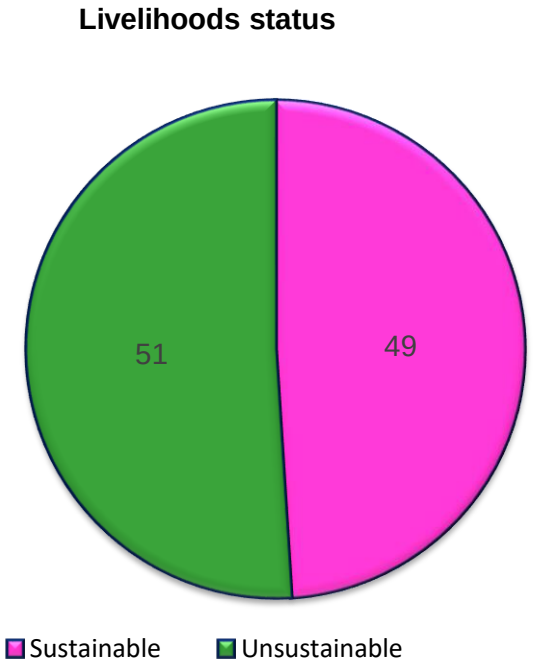

Figure 14: Distribution of the respodents' livelihood status
Source: Field survey, 2018

6.3.1 Gender and sustainable livelihoods

The distribution of the sustainable livelihood according to gender and other background characteristics in the study area are presented in Table 12. The results of the chi square revealed that sustainable livelihood was significantly associated with gender (p = 0.0065), 56.65% of the males and 42.72% of the females were reported to have a sustainable livelihood. The proportion of the respondents with sustainable livelihood was noted to be higher among currently married (52.48%) than unmarried (36.14%). With respect to education

level, the highest prevalence of sustainable livelihood was observed among individuals with secondary or higher education (56.72%) followed by those with primary education (50%). In addition, the level of sustainable livelihood was found to be higher among the respondents aged 34-49 years (54.64%) as compared to the respondents in age group of 17-33 years (53.19%) and 50 and above (33.67%). Regarding the ward of residence, the results showed that the highest prevalence of sustainable livelihood was observed among Bunju residents (59.32%) followed by Mzimuni (57.14%) and Wazo residents (48.96%).

Table 11: Distribution of the sustainable livelihoods according to Socio-cultural factors

Variable	**Livelihood Status**		**Chi square**	**P-Value**
Gender	Sustainable	Unsustainable	7.4067	0.0065
Male	98(56.65)	75(43.35)		
Female	91(42.72)	122(57.28)		
Current marital status			6.9533	0.0084
Married	159(52.48)	144(47.52)		
Not Married	30(36.14)	53(63.86)		
Education level			8.8578	0.0119
Informal	10(27.03)	27(72.97)		
Primary	141(50.00)	141(50.00)		
Secondary/higher	38(56.72)	29(43.28)		
Age (Years)			12.3416	0.0021
17-33	50(53.19)	44(46.81)		
34-49	106(54.64)	88(45.36)		
50+	33(33.67)	65(66.33)		
Ward			13.1597	0.0105
Kunduchi	13(30.95)	29(69.05)		
Wazo	47(48.96)	49(51.04)		
Bunju	70(59.32)	48(40.68)		
Mabwepande	43(42.16)	59(57.84)		
Mzimuni	16(57.14)	12(42.86)		

Source: Field survey, 2018

6.3.2 Influence of gender on sustainable livelihoods

The influence of gender on sustainable livelihoods was accessed using a logistics regression model. Gender was at the core of the analysis of sustainable livelihoods. Other aspects included in the analysis were: marital status, education, age, and ward of residence. Resource ownership and division of labour was found to have a greater influence on men's and women's livelihoods. Table 13 displays the crude odds ratios (OR) together with adjusted odds ratios (AOR) of the fitted unadjusted and adjusted logistics regression models. The results of univariate analysis (unadjusted) showed that gender was significantly associated with sustainable livelihood (OR=1.75, p=0.0067). This means that the odds of male having a sustainable livelihood is almost twice than that of females. In other words, males were significantly more likely to have sustainable livelihoods as female counterparts. The adjusted odds of having sustainable livelihoods among males was 2.2 times than that of females (AOR = 2.15, p = 0.0007).

Men and women can only have equal chances for achieving the same standard of living if they have the same distribution of opportunity and outcomes throughout their life. It has, however, been revealed that in the division of labour, women are in a secondary position relative to men in agricultural production, with fewer rights over land and lesser powers of mobilization of labour. Also, women have been found to have less control over income and the access to markets and services (Masika and Joekes, 1996; Nazneen, 2010). The same situation was shown in the study area, as males were almost 3 times more likely to be involved in land-resource ownership when compared to their female counterparts. It is well known that individuals with greater access to resources and better mobility have a wider variety of options for their livelihoods. Therefore, this study shows that women have less access to livelihood assets than men and may be forced to adopt some survival strategies for their livelihoods. It is also clear that many women are constrained in sustaining their livelihoods because they lack savings, and have poor access to credit, as well as the constant pressure of household responsibilities. Women spend most of the time on household responsibilities and little time on productive activities like farming (Dugbazah, 2012). In the study area, most of

home-based activities were by women and these caused them to have little time to spend on their farming activities.

Other variables that were associated with sustainable livelihoods include the current marital status (p = 0.0090), the education level (p = 0.0156), the ward of residence (p = 0.0123) and having other sources of income (p = 0.0314). However, the results of the multiple logistics regression model (adjusted analysis) revealed that the education level was no longer associated with sustainable livelihoods (p = 0.1582), hence this variable was removed from the model. The final model revealed that a sustainable livelihood was significantly associated with gender (p = 0.0007), current marital status (p = 0.0040), age (p = 0.0049), ward of residence (p = 0.0108), and having other sources of income (p = 0.0047).

With respect to marital status, it was noted that currently married respondents were significantly more capable of having a sustainable livelihood compared to unmarried counterparts (AOR = 2.24, p = 0.0040). This is because marital status has implications for social organization, resource management and crop production (Low 2005; Hegga, 2006). Most married smallholder farmers relied on family labour, reducing the requirement to hire labour and thereby reducing their financial obligations. Therefore, a stable family can support a good organization of UPA, as all members of the family will participate fully in production (Low, 2005).

Age was observed to have a negative association with sustainable livelihood (AOR = 0.97, p = 0.0049). This means that the likelihood of having a sustainable livelihood decreases as subjects become older. A study conducted in Sargodha, Pakistan, showed that the aged people have moved on different pathways throughout their lives. The study showed that ageing is a social change process that is bound to bring a shift in the attainment of resources. The study noted that most of the elderly people were disengaged from their earlier livelihood sources. For example, from their employment when they reached the age of 60, and this has an impact on their overall life. Such a change shows that livelihoods are not static but rather dynamic (Mahmood et al., 2016).

Another factor was the place of residence (ward) for which the prevalence of sustainable livelihoods was observed to be significantly lower among individuals from Kunduchi (AOR = 0.25, p = 0.0006) and Mabwepande (AOR = 0.55, p = 0.0396) compared to those from Bunju. Though not significant, subjects from Wazo (AOR = 0.61, p = 0.0959) and Mzimuni (AOR=0.71, p = 0.4602) also tended to have lower odds of having a sustainable livelihood compared to those from Bunju. The reasons for Bunju having higher odds of sustainable livelihoods through UPA was due to the nature of land ownership, as most of the farmers (about 62%) in the ward cultivated in the Freehold land. The land in Bunju has a high production capacity compared to other wards, and it has enough water sources that are available throughout the year to be used for irrigation. Mzimuni ward faced the challenge of floods several times (plate 6), which contributed to lower chances of attaining sustainable livelihoods through UPA.

According to Baker and Capel (2011), farming varies from place to place due to environmental, economic, and societal factors, which determine the location of agricultural activities. The environmental factors influencing the extent of arable land and terrain, climate, soil properties, and soil water. Crops need space to grow, sufficient light, warmth, and moisture. Water scarcity, together with degradation of arable land, could become the most serious obstacles to crop production in some areas. Human factors such as labour, capital, distance to market, tradition and politics also affect the pattern of agriculture.

Table 12: Unadjusted and adjusted odds ratios for association between gender and sustainable Livelihoods

Variable	Unadjusted analysis			Adjusted Analysis		
	OR	**95% CI**	**P-Value**	**AOR**	**95% CI**	**P-Value**
Gender						
Male	1.75	[1.17,2.63]	0.007	2.15	[1.38,3.35]	0.001
Female	Reference			Reference		
Marital status						
Married	1.95	[1.18,3.22]	0.009	2.24	[1.29,3.87]	0.004
Not Married	Reference			Reference		
Education level			0.016			
Informal	Reference					
Primary	2.70	[1.26,5.79]	0.011			
Secondary/ higher	3.54	[1.48,8.46]	0.005			
Age (Years)	0.97	[0.96,0.99]	0.002	0.97	[0.96, 0.99]	0.0049
Ward			0.012			0.0108
Kunduchi	0.31	[0.15,0.65]	**0.002**	0.25	[0.11,0.55]	**0.0006**
Wazo	0.66	[0.38,1.13]	0.131	0.61	[0.34,1.09]	0.0959
Mabwepande	0.50	[0.29,0.86]	**0.012**	0.55	[0.31,0.97]	**0.0396**
Mzimuni	0.91	[0.40,2.11]	0.8332	0.71	[0.29,1.75]	0.4602
Bunju	Reference			Reference		

Source: Field survey, 2018

6.4 Summary of the chapter

This chapter presented the analysis on the contribution of UPA to socio-economic development. The study reveled that UPA has a positive contribution to the socio-economic development of livelihoods in the study area. Food security, income, availability of basic needs, social relations, and improved health and settlements showed the sustainability of the livelihoods. Men were found to gain more sustainable livelihoods due to their ability to own major means of production like land, and through having more time for farming than women, who spend most of their time taking care of their family (conducting reproductive, rather than productive activities). The study also revealed that there was a relationship between age, maritual status and place of residence and sustainable livelihoods.

CHAPTER SEVEN

THE SUGGESTED STRATEGIES TO IMPROVE UPA

7.1 Challenges facing UPA

Despite the contribution UPA has in the sustenance of livelihoods, the activity is facing a lot of challenges. The study revealed that UPA, especially crops production, encountered several constraints, including pests and diseases, lack of farm inputs, climate variability, land access, low capital, inadequate extension services, and lack of irrigation facilities. Market and water problems were also mentioned to be constraints in UPA, as indicated in table 14. The data in this section were collected through questionnaires that were administered to a sample of 386 respondents. Open questions were used for the discussion of the focus groups and for the interviews with the key informants.

Table 13: Challenges facing UPA in the study area

Challenges	**Ranking**	**Frequency N = 386**	**percent**
Pest and diseases	i	362	93.9
Poor farm inputs	ii	314	81.3
Unreliable rainfall	iii	311	80.5
Land availability and access	iv	288	74.6
Lack of capital	v	274	71
Inadequate extension services	vi	270	69.9
Irrigation technologies	vii	203	52.5
Market problem during rainy season	viii	183	47.4
Water availability and affordability	x	181	46.8

Source: Field survey, 2018

7.1.1 Pests and diseases

Pests and diseases were noted as being a great challenge to agriculture, followed by poor farm inputs (seeds and pesticides) in the study area, as

pointed out by 93.9% and 81.3% of respondents, respectively. According to the focus-group discussions, one of the respondents explained that the problem of pest and diseases has become more severe in current years and some of crop's diseases have no treatment. He gave the following explanations:

"Currently we are experiencing several diseases in our crops that we don't even know their pesticides, for example we have a new tomato disease known as "kanitangaze" which is very dangerous we used to display a variety of pesticides, but we have failed to suppress such a disease." [Ward 1 males; Position: 30-30]

The prevalence of crop pests and diseases continue to increase as a result of climate change, which puts the performance of the agricultural system at risk. Baseka (2016) and Mhache (2015) conducted a study in Dar es Salaam and Morogoro cities and showed that pests and diseases were among the challenges faced the UPA farmers. Pests and diseases affect UPA and lead to slowing down of the production process (Dima et al., 2002).

In addition, farmers were complaining about the high price of pesticides and the presence of fake pesticides and seeds, which cause poor performance in their farming activities. Another farmer from a focus-group discussion commented on these aspects in the following way:

"The big challenge here is pests and diseases. Our crops used to die, seeds are not germinating well and sometimes we are getting poor harvest with low quality because of that problem of pests and diseases. The pesticides are too expensive and sometimes we get fake pesticides and seeds which make the situation worse." [Ward 3; Position: 26-26]

Through direct observation at the time of data collection in the study area, it was noted that maize crops and pumpkin leaves were more affected by pests than other crops. Plate 4 shows the crops affected by pests in the study area. The pumpkin leaves changed their colour to yellow and dried up, while maize crops were severely eaten by insects.

Plate 4: The affected maize crops and pumpkin leaves in Bunju ward
Source: Field survey, 2018

7.1.2 Lack of capital

Lack of capital was observed to be a challenge facing UPA farmers in the study area. In this study, about 71% of the respondents mentioned lack of capital as one of the challenges they face when engaging in UPA. Most of the farmers claimed not having enough capital for example funds to buy agricultural inputsto enable them to conduct farming smoothly. As a result, the harvests were small, despite the large size of their cultivated land.

The finding from this study is in line with those of Dima et al (2002), World Bank (2013), and Mhache (2015), who observed that a lack of capital is among the challenges facing UPA farmers in their study areas. The studies found that most of the crop growers and livestock keepers were constrained by a lack of capital, leading to low production. Low production can finally result in food insecurity in the responsible area. The study by Mhache in Dar es Salaam and Morogoro cities mentioned the lack of capital as among the constraints they face. This tallied with the findings in the current study. Other challenges noted in these studies, which were not found in the current study area, were theft and lack of information.

7.1.3 Land availability and access

Farmers pointed out to have a problem in land availability and access which hindered their performance in agricultural activities. Farming activity in the study area is not permanent, because farmers move from one place to another to look for available and affordable land for farming. The city keeps on growing and, as a result, the land becomes more expensive for the farmer who cannot afford to buy land. Urban growth is creating an increased demand for land for industrial, agricultural and residential developments, which intensifies the competition for land.

Studies from different places, such as Bangalore (India), Accra (Ghana), Nairobi (Kenya), and Lima (Peru) by the World Bank (2013) showed that land availability and access was a major constraint to the development of UPA. High levels of population increase and urban growth in the cities resulted in increased pressure on land and the conversion of agricultural land to non-agricultural uses such as residential, commercial and industrial uses, in urban and peri-urban areas (Word Bank, 2013). This study by the World Bank (2013) identified that high levels of population influx and urban growth in the city of Bangalore had resulted in increased land prices and pressure on agricultural land, with many converting agricultural land to non-agriculture uses. UPA requires intensive production methods because the available space in cities is very limited and also hinders the use of bigger machinery. More advanced technology is needed to increase outputs from UPA (Odhiambo, 2009).

7.1.4 Inadequate extension services and poor irrigation facilities

Nevertheless, inadequate extension services were also a problem noted by UPA farmers in the study area. Farmers in the focus-group discussions had a great need for agricultural education, but most of them had never even seen the agricultural extension officers in their areas. One of the participants in the group said this:

"We need agricultural education to know what to plant when and other things, but we have never even seen the agricultural officer visiting us and we are not

sure if there are agricultural officers in this city; it is you for the first time you have visited us. I think the government does not know if there are people engaging in farming activities in the city of Dar es Salaam." [Ward 1 males; Position: 64-64]

The study also revealed that the farmers were not able to afford the right and required irrigation technologies, thus irrigation activity becomes more difficult for them in the study area. The farmers said that they are using poor facilities, so that irrigation uses a lot of time and effort. Most of them use buckets to carry water and their hands to sprinkle water throughout their plots (plate 5). One of the respondents from ward 5 gave the following explanation of irrigation facilities:

"For me I am using a lot of time for irrigation because water is little far from my farm…I used to carry water using buckets. I took two buckets to carry water until I finish irrigating all the plots in my farm. The condition becomes worse during the dry season because crops need much water. We need your help…at least to buy a small water pump…it will help" [Ward 3; Position: 31-31]

	
	
Wazo ward	Kunduchi ward

Plate 5: The irrigation facilities used by most of farmers in the study area
Source: Field survey, 2018

7.1.5 Market fluctuation

The market of UPA products is not stable in the study area. In an in-depth interview with the agricultural officer from Kinondoni municipality, she explained that:

"The market situation for UPA products in Kinondoni municipality, I can say it is not good and not bad. The market of agricultural products used to fluctuate. As I have said, sometimes you may find the flooding of crops of the same kind in the market and sometimes you may find the needed crops are not found in the market. Others who have well developed technology in farming activities

they used to search for the outside markets. So, others tend to cultivate in a modern way using better seeds and take their agricultural products to the outside markets and sometimes to the supermarkets and make a lot of money." [Agricultural Officer from Kinondoni Municipality; Position: 56-56]

During the rainy season, the market for agricultural products is flooded by crops which leads to a drop-in price for the agricultural produce, because many people cultivate the same types of crops when there is sufficient rainfall. Sometimes the farmers take their vegetables to the local market and fail to sell them, and, as a result, they throw them on the dumping sites or leave them at the market place. Through direct observation, it was also found that most farmers all over the study area cultivate the same types of crops, particularly sweet potatoes leaves, pumpkin leaves, amaranth and okra. This situation leads to a poor market for agricultural products. In an interview with one of the middle men for vegetables from UPA at Tegeta local market said that:

"*When there are many vegetables in the market, we are not going to the farms to buy, we are just staying here to wait for the farmers to bring their vegetables because we incur a lot of cost to harvest and transport vegetables. If vegetables are scarce, we follow the farmers to their farms because we are sure of making profit. And sometimes when the vegetables are scarce especially the Chinese cabbage, we used to buy them from the nearby region of Morogoro in Gairo district". [A leader from Tegeta local market]*

Farmers make profits when the types of crops they harvest at that time are not overly represented in the market. At that time the products can be sold at the highest price, which is three or two times the price when crops flood the market.

7.1.6 Unreliable rainfall

Unreliable rainfall, which led to extreme drought, and sometimes heavy rainfall were mentioned as detrimental events that counteracted the efforts of farmers in their farming activities. The study showed that climate variability has led to increased problems of pests and diseases, water shortages, and sometimes floods, which affect the efforts of farmers in sustaining their UPA practice.

In the years with low rainfall, farmers suffer from water shortage problems, as water in the dams and rivers runs off before the next rainy season begins. The respondents pointed out that the water problem is a challenge facing agricultural activities in the study area. Farmers who conduct farming activities along the areas near to the ocean also experience the problem of water costs and availability. Priority for access to water has generally been given to urban residents, at the expense of urban and peri-urban farmers (Huang et al., 2011; Burgin et al., 2013). Drying-up of water sources is one of the reasons making UPA unsustainable. Ocean water is too salty to be good for vegetables, so farmers use tap water to irrigate their crops. One of the farmers in the questionnaire survey said that they are not able to afford water bills for irrigation. If the rainy season is over, they dig boreholes, which, although not producing pure soft water, at least allows them to irrigate their crops.

Studies conducted in Dar es Salaam by Jacobi et al. (2000) revealed that water was a scarce commodity during the dry season, as the public water-supply system was not adequate to keep up with the requirements of the increasing population in the city, which is said to be growing by 5.6% per year (URT, 2012). In areas in the city where there is no water supply for irrigation, farmers cultivate and produce only during the rainy season, which is not predictable. A study conducted in Namibia in Windhoek and Oshakati mentioned water shortages as one of the challenges facing urban and peri-urban farmers in their agricultural production (Dima et al., 2002).

7.1.7 The impacts of climate change on UPA

Currently, climate change is the most serious environmental threat facing humankind (Agbola, 2011; Boko et al. 2007; Cohen et al., 2008). Cities are exposed to global climate change and the impacts can range from sea level rise, floods, droughts, and damage to infrastructure (Rosenzweig et al. 2011; Grimm et al. 2008). In the study area, the findings show that a majority at 91.5 percent of all respondents admitted observing effects of climate change and see it as a threat, while only 8.5 percent mentioned that they made no such observations (table 15).

Table 14: People's perception on climate change

Response	Frequency	Percent
Yes	353	91.5
No	33	8.5
Total	**201**	**100.0**

Source: Field survey, 2018.

These findings imply that from the farmers' point of view, climate change is a reality in Kinondoni municipality. Many other studies have documented similar observations in different parts of Tanzania, including Kangalawe et al. (2009); Mlozi et al. (2014); and Mwamfupe (2014) in Kasulu, Dar es Salaam, and Rufiji, respectively. Also, studies by Nzeadibe et al. (2011) in the Niger Regions of Nigeria showed the same. The reliance on local rainfall makes rain-fed agriculture vulnerable to climate change. Increased rainfall variability has affected the agricultural calendar and decisions over important farming activities Mwamfupe (2014). The changes in crop production-related climatic variables will possibly have major influences on regional as well as global food production (Abraha and Savag, 2006).

In the questionnaire-based survey, smallholder farmers exhibited knowledge of the impacts of climate change on their urban and peri-urban agriculture. The effects of temperature and rainfall changes on crop production in Kinondoni municipality are presented in Figure 16. Temperature change and unreliable rainfall was said to be the cause of water shortages in the study area. Increased temperatures lead to water shortages due to an increased rate of evaporation. In Figure 16, pests and diseases was ranked number one (88.3%) whereas water shortages caused by unreliable rainfall ranked number two (66.8%). More than 63% of the respondents said that low yields were more challenging than the drying of crops (32.6% of the respondents).

However, about 27.2% of the farmers in the study area claimed to have had floods due to unpredictable, heavy rainfall, which brought large losses of their crops. Especially for those farms located in low land areas, such as river valleys, are frequently affected by floods. For example, rainfalls in April 2018

destroyed many farms located along the Msimbazi and Mpiji river valleys. Most of the crops were swept away by the running water and others were covered by mud. Some parts of the farms were eroded by the running water, which caused the size of the farms to be reduced. Plate 6 shows the farms along Msimbazi river valley at Mzimuni ward that were affected by rainfall in April 2018.

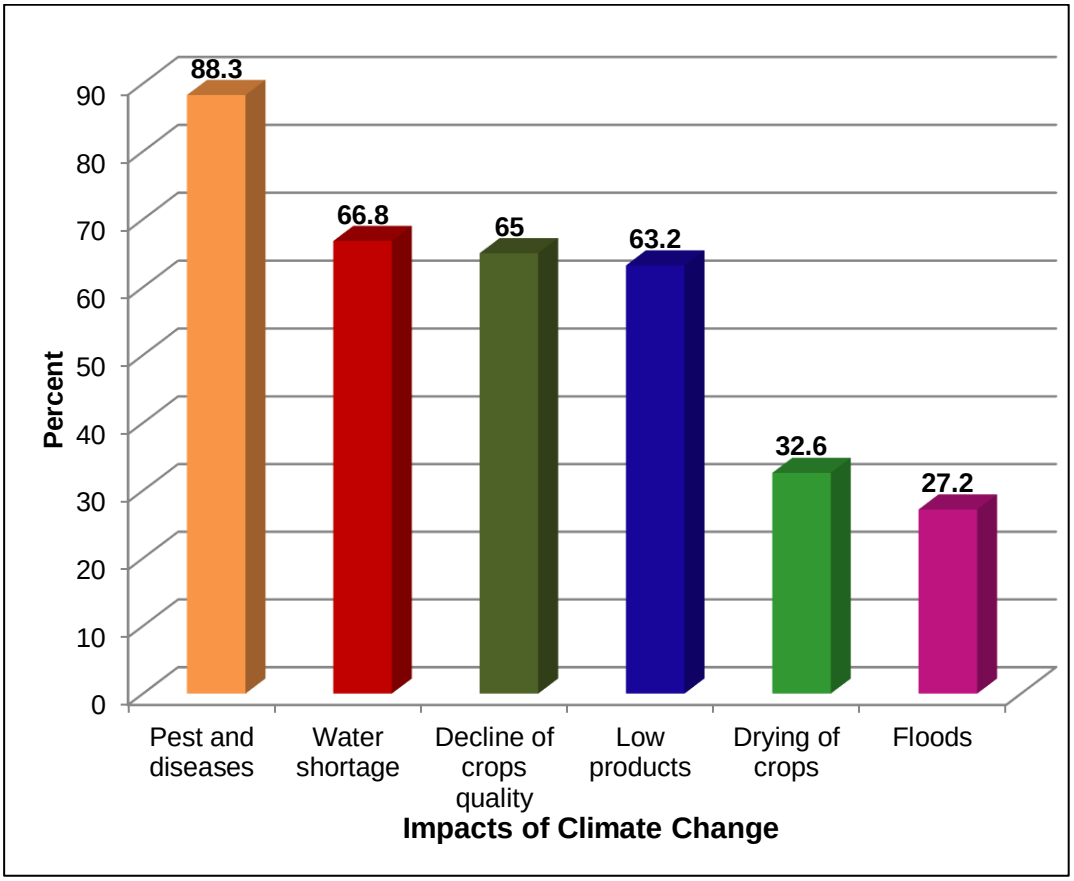

Figure 16: Impacts of unreliable rainfall and increased temperature on UPA
Source: Field survey, 2018(Based on multiple response)

Kinondoni municipality has a problem in climate variation, which leads to outbursts of pests and diseases, and drying of crops, hence low yields of UPA products. Baker (2013) showed that increased temperature and unreliable rainfall leads to increases in crops diseases, which in turn brings extreme poverty to the smallholder farmers. IPCC (2007) showed that an increase in temperature adversely affects crops, as excessive heat is a limiting factor for

production. Kasimba (2012), who conducted a study in Zimbabwe, showed that increased temperature is a threat to crop growth, as they end up drying out.

	
A farm destroyed by running water during the flood in Mzimuni ward	A farm covered with mad in Mzimuni ward

Plate 6: Farms covered by mud and destroyed by water by the floods in Mzimuni ward

Source: Field survey, 2018

Climate change in the study area was also shown to have an impact on gender roles. It has forced men and women to engage in various activities which they previously were not doing. Women were more affected by the impact of climate change in the study area. Through focus-group discussions, the study revealed that climate change has forced more women to change their roles in order to cope with its impacts. Women at Kunduchi and Mzimuni wards said that during the dry or heavy rain seasons, they cannot farm. When they stop cultivating, they are forced to engage in other activities, like petty trade, crushing stones, and sometimes doing domestic tasks in other people's houses, like washing clothes to get money. One of the respondents from Mzimuni ward said that:

"We are conducting agricultural activities seasonally, usually during the summer season we conduct agricultural activities happily and get profit. During rainy season all these areas you see around are flooded with water and mud, so it is not possible to continue with cultivation by that time, we move and do other things like petty trade which is not paying much like farming on my side." [Ward 4; Position: 29-29]

In response to the effect of unreliable rainfall and temperature increase in the study area, UPA farmers have coped by adopting several strategies (table 16). A majority of the farmers (about 65%) use pesticides to overcome the problems of pests and diseases on their farms. Also, they increase the amount of fertilizers, particularly organic manure like manure from chickens, to increase the productivity of the soil if the soil has been affected by heavy rainfall and loses fertility.

Table 15: Adaptation strategies employed by farmers

Adaptation strategy	**Ranking**	**Frequency (N=353)**	**Percentage (%)**
Use of pesticides and fertilizers	i	272	77
Use irrigation system	ii	265	75
Removing the affected crops	ii	251	71.1
Have a pause on farming	iv	122	34.5
Dig deep wells to get water	v	89	25.2
Mulching	vi	14	3.9

Source: Field survey, 2018

About 75.0% of the respondents use irrigation systems to overcome the problem of drying of crops during the dry season. Farmers use water from the dams, and others dig boreholes in the riverbed to increase the amount of water for irrigation (plate 7). Also, some farmers used to stop farming during the dry season, because their farms are located in the areas with no an access to underground water in years of low rainfall, unless they decide to dig a deep well, which is too expensive for most of them.

About 71.1% of farmers removed the affected crops to reduce the speed of disease spread to the remaining crops. Few farmers (about 3.9%) used to mulch their soils to protect them from evaporation during the dry season, but some didn't manage this because they could not get enough leaves to cover their soil.

Plate 7: Dams used by farmers for irrigation in Mabwepande ward
Source: Field survey, 2018

The adaptation strategies practiced by smallholder farmers in the study area are more or less similar to those reported by several authors, which were adopted by people for the sustainable production of various crops in different areas (Stärken and Wandeln, 2007; Smith and Martino, 2007; URT, 2007; Paavola, 2008; ICO 2009; Läderach et al., 2010; Nindi and Mhando, 2012). Altering amounts and timing of irrigation and other water-management practices have been suggested to be one of several good adaptation strategies relevant for smallholder farmers (Läderach et al. 2010). However, the use of irrigation systems was, for example, observed to be only practiced by some smallholder farmers, while others could not due to a lack of capital for buying irrigation facilities like water pumps and pipes (Smith and Martino, 2007; URT,

2007). Some farmers stop farming for a while and wait for the rainy season, as they cannot use irrigation because water is scarce.

7.2 The suggested strategies to improve UPA

Farmers in the study area suggested several strategies for the improvement of UPA in the study area. The most important suggestions were to get quality inputs, political participation, and access to loans or capital, and education and technology, as indicated in figure 17.

Table 17: Suggested strategies to improve UPA in the study area

Strategy	Ranking	Frequency	Percent
Quality inputs	i	359	93.0%
Get enough capital	ii	323	83.7%
Education	iii	296	76.7%
Improved markets	iv	284	73.6%
Technologies	v	264	68.4%
Political participation	vi	249	64.5%
Access to loan	vii	193	50.0%

Source: Field survey, 2018

About 93% of the farmers suggested that better inputs, such as seeds, fertilizers and pesticides, are a good way to improve agriculture in the study area. The study identified pests and diseases as a major constraint for UPA developments. Farmers thus suggested overcoming the problem by having quality inputs, instead of the fakes that are sold to them. As a result of climate change, the prevalence of crop pests and diseases continues to increase, putting agricultural systems at risk. A large portion of agricultural production is lost due to pests and diseases, which also includes invasive weeds (McDonald and Riha, 2009; Smith, 2015). Also, farmers in the study area suggested that enough capital as one way to improve farming activities. In focus-group

discussions, farmers explained that they fail to develop well in their farming because they do not have enough capital to run their farming activities. One farmer from ward 4 had this to say:

"We need to be ensured with accessibility to capital so that we can use the capital to improve our agricultural production intensively." [Ward 4; Position: 55-55]

Moreover, farmers insisted on the importance of education for their success in farming activities. The farmers need to learn skills from the people who know how to conduct farming activities effectively, particularly extension officers. More than 76% of all respondents need education for effective farming.

Improved markets were said to be a catalyst for the improvement of farming activities in the study area. Farmers and agricultural product traders suggested improving the market for agricultural products for sustainable UPA. The farmers need to have a formal market for their products, because they are selling their products to an informal market and most of them are selling to the middle men, who gain more than the farmers.

Availability and affordability of irrigation and storage technologies would be more helpful for the development of agriculture in the study area. Farmers said that the presence of irrigation technologies, like the use of pumps to irrigate, will simplify the work of irrigation and the farmer would be able to cultivate more land for more harvest during the dry season. Also, the access and affordability of storage facilities would help to improve the market of agricultural products. It was found that if farmers would be able to process and add value to their agricultural products, market access would not be a problem, because they would be able to keep their products for a longer period of time without loss of quality. More than 68% of the respondents need improved technologies for sustainable agriculture.

However, some of the farmers (about 64%) noted the importance of government participation for the sustainability of UPA in the study area. The study revealed that only the government can assure the availability and access of land and water for the improvement of UPA. Farmers need political leaders

at the local level, such as ward councillors, to see the importance of UPA and become involved, to facilitate its presence and growth. Also, if the government participates and sees the importance of UPA, it will become easier to include UPA in the city plan. One of the farmers from the focus group discussion gave the following suggestions:

"If possible, we request the government to provide land where we could continue cultivating because our life entirely depends on agriculture, it is our employment. We need permanent areas to conduct our agriculture in the city." [Ward 1 males; Position: 59-60]

Farmers also suggested the availability of loans with simple conditions for farmers, so as to improve their capital for agriculture. Also, the extension officer insisted that the farmers create strong social groups, which will simplify their accessibility to loans. The following explanations were given by one of the extension officers from the study area:

"I am still insisting for the farmers to have strong social groups in order to get quick services from the government or non-governmental organizations. It is very simple to serve farmers in groups than an individual farmer… I also, insist them to use modern technology in cultivating their crops, and try to make an investigation of what kind of crops to grow when than just growing." [Agricultural Officer ward 1; Position: 57-57]

Provision of credit and loans to urban farmers encourages and promotes UPA as it helps to overcome the problem of capital while the creation of infrastructural supports like land access, water, seeds, fertilizers, pesticides, and tools for agricultural activities might influence UPA participation for sustainable livelihoods (Tiraieyari et al., 2019)

7.3 Summary of the Chapter

The chapter found pests and diseases, land access and availability, and unreliable rainfall to be the major challenges facing UPA in the study area. Climate change was also found to affect farming negatively, as it leads to the drying of crops, a decline of crop yields due to pests and diseases, and water

shortage caused by changes in the rainy season and its intensity. Most farmers in the study area were seen to adapt to the challenges caused by climate change through the use of pesticides and fertilizers, irrigation system, the removal of affected crops, and sometimes through stopping farming activities.

CHAPTER EIGHT

CONCLUSION AND RECOMMENDATIONS

8.1 Introduction

This chapter in its first part gives the conclusions drawn from the use of capability theory. The second part outlines the conclusions based on the findings of this study, while the last part presents the recommendations based on the conclusions.

8.2 Applicability of the capability theory in this study

The capability theory was used in this study as the theoretical framework to address the research objectives. The major emphasis of the Capability Theory is that of assessing a person's quality of life by focusing on the effective opportunities that people have to lead the lives they value, and not primarily focusing on the resources they have (Robeyns, 2006). The theory also states that the capability sets enable people to choose the kind of life they wish to live and thus improve their livelihoods.

The main agenda of the capability approach is based on the notion that the assessment of the developmental level of a person should not primarily focus on their resources. The theory considers that development of livelihoods depends on the effective opportunities people have, which lead them to the kind of life they value (Robeyns, 2005). The core of this study was to find out how UPA improved people`s livelihood through presenting different capability sets. These ideas make the theory suitable for the study. Nussbaum (2003) noted that the capability theory has a very long list of capabilities, which pose difficulties in determining which one is more beneficial than the other. The researcher therefore needs to use wisdom to select the capability sets they believe to be important. The analysed and discussed capability set in this study is the one which is the most detectable in and applicable to UPA.

The theory states that the available capability sets give people the ability to choose their kind of life and thus improve their livelihoods. The UPA farmers exploited the capability sets presented to them, but there is still doubt whether they chose the kind of life they wanted to live, or whether instead the available

resources compelled them to choose the kind of life they were living. For example, to most of the farmers in the study area, the income earned from UPA was usually not enough to meet most of their basic needs. The farmers pointed out that they wish that agriculture could be improved to provide all they needed to get from it. The question here is: Have UPA farmers have a choice in the kind of things they wish to do with the income to sustain their livelihoods, or are they just driven by the amount they gained from farming? The theory has no clear explanations on this concern.

8.3 The capability sets

The major theme of this study was to understand how UPA is presenting different capability sets for improving people's livelihoods. The most visible and pertinent capability sets provided by UPA were analyzed and discussed together with the socio-economic outcomes of UPA in this study. UPA is considered to be a very important commodity in the study area due to different capability sets it presented. The capability sets in this study were: food security, income generation, social relations, education, and physical health of the household members.

Food security is one of the critical capability sets provided by UPA in the study area. UPA provides nutritious food to the farmers themselves and the surrounding community. In general, UPA has improved food access and availability in the study area, as vegetables and other crops are readily available. Other types of food that are essential can be purchased using the money generated through selling some UPA products.

Also, income generation was discussed as one of the most important capability sets provided by UPA. Most of the farmers in the study area produce and sell agricultural crops for their own income. The income has, to a large extent, been used to buy other types of food that are not produced by farmers, like cooking oil, sugar, rice and meat. In the study area, choices relating to income generation are governed by food availability and access; once these are satisfied, the money can be used for other needs such as school fees, improvements to houses, and other needs of the household. Income availability

in the household gives room for people to choose a certain kind of life they want to live.

UPA has also provided improved social relations among the farmers in the study area. Through UPA, farmers were able to create free and strong associations among themselves and with other members in the society. They built trust and a willingness to share information among farmers, which enabled them to form strong groups like Organic farming, New Hope and Drive-in groups in which they share information, agricultural facilities and conduct some agricultural activities together. The situation has helped farmers choose and value the life they are living now.

The quality of education has been improved among urban farmers through UPA. People are able to provide school requirements like school fees and buying school materials for their children. Also, farmers had been benefiting by gaining skills and knowledge by working in urban and peri-urban faming activities.

Moreover, health improvements are among the capability sets provided by UPA in the study area. UPA has made room for farmer's households to have access to fresh, healthier and nutritious food from their farms. The households get fresh vegetables and fruits from the farms, which is very important for their health. Having healthy conditions physically, mentally and psychologically helps people to do whatever they want for the improvement of their livelihoods.

UPA seems to provide essential capability sets for socio-economic development in the study area, but the challenges facing UPA makes it difficult for the farmers to improve their choices. More effort has to be taken to overcome the challenges facing UPA to improve it for sustainable livelihoods of the UPA farmers in the study area.

8.4 Conclusion

Most of the urban men and women in the study area are in the active age range, married, have attained a primary, secondary or tertiary level of education, and some are working class. The majority of UPA farmers in the study area has no

formal employment and has a small farm size. Urban men and women participate in a number of agricultural production activities on a small scale, mostly cultivating vegetables.

UPA in the study area is practiced mostly by migrants from rural areas of Tanzania, and is not a permanent activity, due to lack of land and water. Most urban produce is sold directly from the farm and to the local markets, and very little goes to the supermarkets. Urban and peri-urban agriculture contributes positively in sustaining peoples' livelihoods in the study area through the provision of income, food, employment, and other household needs like clothing, settlements, education, and health services.

However, several factors, including food security, income generation, employment, and preference for fresh food influenced men and women in the study area to participate in agricultural production. The motivational factors differed between men and women, as more women were influenced by food security and preference for fresh food, while more men were influenced by income generation. Urban men and women participating in UPA activities are mostly constrained by a lack of land, by pests and diseases, water scarcity, inadequate capital, and lack of awareness of agricultural production skills.

UPA was found to provide the needed capability sets for the farmers to choose the kind of life they value for the improvement of their livelihoods in the study area. Farmers were able to have food, income, improved health, and settlements through UPA.

The findings of this study contribute to the scientific body of knowledge on the issue of urban and peri-urban agriculture. The study set out to assess the role of gender in supporting livelihoods through UPA. This is the first study done in the context of Tanzania using the capability theory, which has provided scholars with detailed information on the capability sets obtained by UPA farmers in sustaining their livelihoods. The study had also described different roles of men and women in the study area and the way they have contributed to sustainable livelihoods. The study raises awareness amongst the farmers and policy makers of the socio-economic importance of UPA. In addition, the

study may influence the implementation of the stipulated policies on UPA for sustainable livelihoods in urban centers. The study documents enough empirical findings with valuable details in the study area and brings a significant number of data sources and methods to validate the data and the findings.

The findings from this study can be applied to other cities of Africa, because most of cities have shared characteristics. Africa's urbanization is characterized by insufficient infrastructure, a lack of formal jobs, unplanned settlements, often weak regulations, and, in some countries, the difficulty of obtaining title deeds for land. Therefore, the recommendations from this study can be implemented by other African cities that share characteristics with the city of Dar es Salaam. There were no specialized findings in the study area which would preclude their application to other cities of Africa.

8.5 Recommendations

Urban and peri-urban agriculture plays a vital role in food security, income generation, employment, and provision of important household needs. The activity is, however, not sustainable because of lack of land, the occurrence of pests and diseases, and water shortages. Based on the research findings obtained, the following recommendations are made to different groups:

8.5.1 Recommendations to the decision makers

- The Government and other stakeholders such as NGOs should take a more positive attitude by recognizing the importance of urban and peri-urban agriculture and assist in improving and expanding water-supply systems for sustainable agriculture.
- The Government and other stakeholders such as banks need to provide subsidies and credit facilities with good conditions, to increase the drivers of productivity.
- In urban planning, the government should put in place strategies to implement existing urban agricultural policies and recognize urban farming as a valuable land-use type.
- The provision of better extension services needs to be strengthened and farmers encouraged to participate in and attend training

seminars and workshops related to urban and peri-urban agriculture.

- The government is advised to ensure allocation of specific places for farming activities and facilitate the use of modern technology. There is a need to empower the urban and peri-urban farmers to engage in farming systems that require small pieces of land with limited use of water while providing a large quantity of products.

8.5.2 Recommendations to the UPA farmers

- UPA farmers should show solidarity by forming and joining farmer groups for easy access to various services such as financial services, training and sharing of production costs. Farmers can share different things, such as storage facilities, processing and packaging, materials and knowledge. The groups should be formalized.
- Farmers are advised to use an organic way of farming, as in the use of organic manure and pesticides.
- Farmers need to share and exchange ideas, knowledge and information with other farmers and to make use of the information for agricultural improvement.
- Farmers should attend training seminars and workshops related to urban and peri-urban agriculture for sustainable farming.

8.5.3 Suggestions for Further Studies

This study covered the gender contribution in sustaining livelihoods but has not covered all aspects of urban and peri-urban agriculture. Therefore, further studies are needed on:

- The impact of urban and peri-urban agriculture on health and nutritional status of the consumers, depending on the location of the farms and the water used for irrigation. Some of the farmers in the city use waste water for irrigation and some farms are located along roads from which they receive a lot of greenhouse gas emissions from cars.

- Negative impacts of urban and peri-urban agriculture on the environment, as some farms are located along flood-prone areas and some farmers cultivate closer to water sources.
- The impact of female empowerment in UPA productivity in the city of Dar es salaam.
- The examination of gender roles in agriculture in rural and urban environments.
- Other mega-cities of Africa to see if the situation is the same or whether there are some differences.

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APPENDICES

APPENDIX 1

A household questionnaire administered to urban farmers

Date of interview……..……..
Respondent number ……..……
Ward ……
Time ……. (Morning/afternoon/evening)

A. Farmers characteristics

1. Age (years) ……..…
2. Gender …….
   a) Male b) Female
3. Marital status ……..
   a) Married c) Widowed
   b) Single d) Separated
4. Origin ……
   a) Native b) Migrant

If migrant what is your place of origin? ……

5. Size of the household ……
6. Monthly income ……..
7. Education level ……..
   a) Informal education c) Secondary
   b) Primary d) Tertiary
8. Occupation status…….
   a) Employed b) Self employed
   c) Others (Specify). ……

B. Information about crops cultivation and livestock keeping

9. Do you cultivate crops?
   a) Yes b) No
10. What types of crops do you cultivate?
    a) ……
    b) ……
    c) ……
    d) ……

e) ……

f) ……

g) ……

h) ……

11. Tick the groups which are engaging more in UPA in your area

a) Employed
b) Unemployed
c) Retired persons
d) Youth
e) Elders
f) Poor
g) Others (specify) ……

12. Put the responsible gender (males/female or both) in front of the mentioned roles.

Cooking (……)

General cleaning (……)

Taking children to school (……)

Bathing children (……)

Disciplining children (……..)

Providing shelter (……)

Providing clothes (……)

Providing food (……...)

Taking children to the hospital (……)

Decision making in the family and within political activities (……)

Others (specify) ……

13. Put the responsible gender in front of the mentioned roles in UPA (males/female or both).

a) Preparing land/soil (……)
b) Watering the garden (……)
c) Fertilizer application (……)
d) Weeding and pest control (……)
e) Planting (……)
f) Harvesting (……)
g) Deciding what to plant (……)
h) Dividing the profit (……)
i) Land ownership (……)
j) Others (specify) ……

14. Who own the land for urban and peri-urban agriculture?

a) Individuals
b) Government
c) Agricultural groups
d) Others (specify)……

15. Who own the products from urban and peri-urban farming?

a) Males
b) females
c) Both males and females

D**. Factors determining men's and women's participation in UPA**

16. What were you doing before engaging in urban/peri-urban agriculture?

a) Small Business
b) Employed
c) A student
d) House wife
e) Unemployed
f) Self employed
g) Others (specify) ……

17. Tick the appropriate reason/s influenced you involving in urban/peri-urban agriculture.

a) Land availability
b) Government policy
c) Poverty alleviation
d) Unemployment problem
e) Education level
f) Preference for fresh food
g) Increase food security
h) Market availability
i) Retirement
j) Others (specify) ……..……

18. Do you have any other source of income apart from UPA?

a) Yes ……
b) No ……..

If yes mention them

i. ……
ii. ……
iii. ……
iv. ……

D. Contribution of UPA in sustaining livelihoods

19. Is UPA provides enough food and income in your household?

a) Yes
b) No

20. Tick the appropriate benefit obtained from urban/peri-urban agriculture.

If yes, Tick the impacts of climate change on urban and peri-urban farming.

a) Dry of crops

b) Pest and diseases

c) Seeds fail to germinate

d) Low products/harvest

e) Decline of crops quality

f) Others (specify) ……

1. Tick the adaptation strategies you have employed to overcome the bad impacts of climate change on agricultural activities.

a) Using irrigation system

b) Mulching

c) Have a pause on cultivation and shift to other activities

d) Use of pesticides and fertilizers

e) Removing the affected crops and plant

f) Others (specify) ……

Thank you very much for your time and co-operation

APPENDIX 2

Interview guide for the key informants at wards /municipal level

My name is Christina Kifunda, a PhD student in the Department of Business Administration, Economics and Law at the University of Oldenburg in Germany. I am conducting a research on gender roles in sustaining livelihoods through urban and peri-urban agriculture in the city of Dar es Salaam. I am asking your help in this study by answering the interview questions. Your participation to this study is voluntary and the provided information will be treated with a high degree of confidentiality. I highly appreciate your corporation.

Section A: Self introduction

i. Name ……
ii. Tittle ……..
iii. Your responsibilities ……
iv. General explanations on the responsibilities of the agricultural department at wards/municipal levels

A. Agricultural practices in the city of Dar es Salaam

1. What is the situation of urban and peri-urban agriculture in your municipality?
2. What kinds of people (in terms of jobs and education status) are engaging much in agricultural activities?
3. What about livestock keeping, do farmers also keep animals? To what extent?
4. Are there any laws, rules and regulations abiding farming activities in your area?
5. How do farmers obtain land for farming activities?

B. Men's and women's participation in UPA and decription of their roles

6. Who dominate urban and peri-urban agriculture? Men or women? …… Give the reasons for your answer. …….
7. Which age group of men and women is participating more in UPA?
8. Is there any kind of job distribution between men and women in your area?
9. Do gender roles change with urbanization process?
10. Is there gender discrimination in your area?

C. Factors for men and women of different age to participate in UPA

11. Why are people continually turning to urban and peri-urban agriculture as a livelihood strategy?
12. What is the market situation of UPA products?
13. What are the challenges facing UPA in your area?
14. Which measures have you taken to help farmers in your area?

D. Socio-economic contribution of UPA to people's livelihoods

15. What are the economic benefits do farmers get from UPA?
16. What are the social effects of UPA to the farmers in your area?
17. Which opportunities rose up as a result of men?

Thank you for being with me.

APPENDIX 3:

Guiding questions for local market traders

My name is Christina Kifunda, a PhD student in the Department of Business Administration, Economics and Law at the University of Oldenburg in Germany. I am conducting a research on gender roles in sustaining livelihoods through urban and peri-urban agriculture in the city of Dar es Salaam. I am asking your help in this study by answering the interview questions. Your participation to this study is voluntary and the provided information will be treated with a high degree of confidentiality. I highly appreciate your corporation.

Name of the respondent (optional) ……
Age of respondent ……
Sex……
Marital status ……
The name of the local market ……

Questions:

1. For how long have you been engaged in agricultural products business?
2. What kind of agricultural products do you buy and sell?
3. Where do you get those products?
4. What is the structure of your business? (in terms of price, mode of buying and selling)
5. What are the challenges you face in conducting business on agricultural products?
6. How do you solve the above-mentioned challenges for sustainable business?
7. What are the benefits you obtain from conducting business on agricultural products?

Thank you very much for your corporation.

APPENDIX 4:

Topics for Focus Group Discussions

List of Participants

Date _____

No.	Name	Age	Gender
1.			
2			
3			
4			
5			
6			

Name of the ward …….

Topics for the discussions

1. General explanations on urban and peri-urban agricultural practices
2. Men and women of different age groups participation in urban/peri-urban agriculture.
3. Role of men and women on urban/peri-urban agriculture
4. Factors for gender participation in urban/peri-urban agriculture.
5. Gender roles changes and causes of those changes in the study area.
6. Socio-ecological impact of urban and peri-urban agriculture.
7. Strategies to improve urban and peri-urban agriculture

Thank you very much for your time and your participation in my study

APPENDICES 5
Research clearance letter 1

UNIVERSITY OF DAR ES SALAAM

OFFICE OF THE VICE CHANCELLOR
P. O. BOX 35091 ♦ DAR ES SALAAM ♦ TANZANIA

General: +255 22 2410500-8 ext. 2001
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Telefax: +255 22 2410078

Telegraphic Address: UNIVERSITY OF DAR ES SALAAM
E-mail: vc@admin.udsm.ac.tz
Website address: www.udsm.ac.tz

Ref. No: AB3/12(B)

Date: 17th August 2018

Regional Administrative Secretary
Dar es Salaam Region

RE: REQUEST FOR RESEARCH CLEARANCE

The purpose of this letter is to introduce to you **Ms. Christina Kifunda** who is a bonafide PhD student of the University of Oldenburg and who is at the moment required to conduct research. Our students undertake research activities as part of their study programmes.

In accordance with government circular letter Ref. No. MPEC/R/10/1 dated 4th July 1980, the Vice Chancellor of the University of Dar es Salaam is empowered to issue research clearances to staff members and students of the University of Dar es Salaam on behalf of the government and the Tanzania Commission for Science and Technology (COSTECH). I am pleased to inform you that I have granted a research clearance to **Ms. Kifunda.**

I therefore, kindly request you to grant her any help that may enable her to achieve her research objectives. Specifically we request your permission for her to meet and talk to the leaders and other relevant stakeholders in your region in connection with her research.

The title of her research is **'The Role of Gender in Supporting Livelihoods through Urban and Peri-Urban Agriculture: The Case of Kinondoni Municipality, Dar es Salaam, Tanzania'.**

The period of her research is from **October 2018 to January 2019** and the research will cover **Dar es Salaam Region.**

Should there be any restrictions, you are kindly requested to advise us accordingly. In case you require further information, please do not hesitate to contact us through the Directorate of Research and Publication, Tel. +255 22 2410500-8 Ext. 2084 or +255 22 2410727 and E-mail: research@udsm.ac.tz.

Yours sincerely,

VICE CHANCELLOR
UNIVERSITY OF DAR-ES-SALAAM
P.O. Box 35091
DAR-ES-SALAAM

Prof. William A. L. Anangisye
VICE CHANCELLOR

QUOTATION OF REF. NO. IS ESSENTIAL

APPENDICES 6

Research clearance letter 2

UNIVERSITY OF DAR ES SALAAM

OFFICE OF THE VICE CHANCELLOR
P. O. BOX 35091 ♦ DAR ES SALAAM ♦ TANZANIA

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Telegraphic Address: UNIVERSITY OF DAR ES SALAAM
E-mail: vc@admin.udsm.ac.tz
Website address: www.udsm.ac.tz

Ref. No: AB3/12(B)

Date: 17th August 2018

Executive Director
Kinondoni Municipal Council
Dar es Salaam Region

RE: REQUEST FOR RESEARCH CLEARANCE

The purpose of this letter is to introduce to you **Ms. Christina Kifunda** who is a bonafide PhD student of the University of Oldenburg and who is at the moment required to conduct research. Our students undertake research activities as part of their study programmes.

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The period of her research is from **October 2018 to January 2019** and the research will cover **Kinondoni Municipality.**

Should there be any restrictions, you are kindly requested to advise us accordingly. In case you require further information, please do not hesitate to contact us through the Directorate of Research and Publication, Tel. +255 22 2410500-8 Ext. 2084 or +255 22 2410727 and E-mail: research@udsm.ac.tz.

Yours sincerely,

VICE CHANCELLOR
UNIVERSITY OF DAR-ES-SALAAM
P.O. Box 35091
DAR-ES-SALAAM

Prof. William A. L. Anangisye
VICE CHANCELLOR

QUOTATION OF REF. NO. IS ESSENTIAL

APPENDICES 7
Research clearance letter 3

UNIVERSITY OF DAR ES SALAAM
OFFICE OF THE VICE CHANCELLOR
P. O. BOX 35091 ♦ DAR ES SALAAM ♦ TANZANIA

General: +255 22 2410500-8 ext. 2001
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Telegraphic Address: UNIVERSITY OF DAR ES SALAAM
E-mail: vc@admin.udsm.ac.tz
Website address: www.udsm.ac.tz

Ref. No: AB3/12(B)

Date: 17th August 2018

TO WHOM IT MAY CONCERN

RESEARCH CLEARANCE

The purpose of this letter is to introduce to you **Ms. Christina Kifunda** who is a bonafide PhD student of the University of Dar es Salaam.

Ms. Kifunda has been permitted to conduct a research titled **'The Role of Gender in Supporting Livelihoods through Urban and Peri-Urban Agriculture: The Case of Kinondoni Municipality, Dar es Salaam, Tanzania'.**

The period for which this permission has been granted is from **October 2018 to January 2019** and will cover **Dar es Salaam Region.**

It will be appreciated if you will provide the researcher any assistance that may enable her to achieve her research objectives.

VICE CHANCELLOR
UNIVERSITY OF DAR-ES-SALAAM
P.O. Box 35091
DAR-ES-SALAAM

Prof. William A. L. Anangisye
VICE CHANCELLOR

QUOTATION OF REF. NO. IS ESSENTIAL