

**CONTRIBUTION OF URBAN AGRICULTURE ON IMPROVING  
PEOPLE'S LIVELIHOOD, IN URBAN AREAS: A CASE OF  
DODOMA MUNICIPALITY, TANZANIA**

By

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Dissertation Submitted in Partial Fulfillment of the Requirements for Award of  
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The University of Dodoma

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## CERTIFICATION

The undersigned certifies that has ready and hereby recommended for acceptance by the University of Dodoma a dissertation entitled **“Contribution of Urban Agriculture on Improving people’s livelihood: A Case study of Dodoma Municipality, Tanzania”** in partial fulfillment of the requirements for Degree of Master of Arts in Development Studies of the University of Dodoma

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## **DEDICATION**

I would like to dedicate this work to my beloved wife Anna Rutaihwa for encouragement, support and love you gave me during my studies. Also to my father Justinian Lugemalila and my parents in law Mr. and Mrs. Tryphone Rutaihwa for their support.

## **ABSTRACT**

This study assessed the contribution of Urban Agriculture on the improvement of people's livelihood in Dodoma Municipality. The study focused on identifying the types of Urban Agriculture practiced in the study area, analyzing the characteristics of household involved in Urban Agriculture and ascertaining the contribution of Urban Agriculture on household food and income generation.

Four wards namely Kilimani, Kikuyu North, Kikuyu South and Mkonze were involved in the study. A sample of 123 urban farmers, 15 customers, 2 extension officers and 1 Capital Development Authority planner were involved in the study. Data collection methods included interviews, Focused Group Discussion, in-depth interviews and observations. Both primary and secondary data were collected and qualitatively analyzed using a content analysis and descriptive statistics such as means, percentages and frequencies.

The results indicated that Urban Agricultural activities are dominated by women who accounts for about 57.7% of the urban farmers. About 45% of urban farmers had primary school education levels. The results revealed that crop cultivation (96%) was the major type of Urban Agriculture practiced (96%) due to its contribution in improving food security. Also it was revealed that Urban Agriculture has a great contribution to the household poverty alleviation through income generation (15.6%) and food security (76.2%).

It is recommended that, the government should provide assistance in terms of extension services, training facilities, credits, soft loans and entrepreneur skills essential to the Urban Agriculture.

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## **LIST OF ABBREVIATION**

CDA	Capital Development
FAO	Food Agricultural Development
IFAD	Food Agricultural Organization
SDA	Swedish International Fund
SUDP	Strategic Urban Development Planning
UA	Urban Agriculture
UNDP	United Nations Development Programme
UNHCR	United Nations High Commissioner for Refugees
UPA	United Peri-urban Agriculture
WHO	World Health Organization

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background information**

Urban Agriculture (UA) is the practice of crop production and livestock keeping in or around urban areas (Bailey, 2000). Urban agriculture may include different types of crops (grains, root crops, vegetables, mushrooms, fruits) animals (poultry, rabbits, goats, sheep, cattle, pigs, guinea pigs, fish, etc.) or combinations of both. Often the relatively highly valued crops and animal products and by-products are favored in UA (SDA, 2003).

Urban Agriculture if given proper and full attention can contribute significantly to poverty reduction through improved food and income (FAO, 2014). Home-grown foodstuffs increase the total amount of food available to a household and thus prevent hunger, malnutrition and income poverty (Mourgeot and Agropolis, 2005). The proportion of people involved in UA is increasing due to fast growth of the population in urban areas (FAO, 2014).

The world is experiencing an increasing number of people involved in UA where by about 800 million people are involved in UA worldwide (Cofie et al. 2033). It is estimated that one-quarter of the world's urban population and nearly all of the world's population growth by 2030 will be concentrated in urban areas making almost 60% of people living in cities. This will increase the demand for food (FAO, 2014).

The United Nations Development Programme estimates that 15% of food requirement worldwide is grown in cities. Example of a powerful shift toward urban

agriculture includes Russia where UA produces 30% of the total food grown in the country and 80% of the vegetables (Smith, 2010). Other examples include Cuba where one-half of the vegetables consumed in Havana is produced in UA and Singapore where UA produces 80% of the poultry and 25% of the vegetables consumed in the country (Smith, 2010). It is estimated that Londoners could produce up to 232,000 tons of fruits and vegetables or 18 percent of the population's nutritional needs (Smith, 2010). In U.S, Massachusetts State produces 15 percent of its food needs from UA (Smith, 2010). There is potential to increase production of Urban Agriculture for livelihood improvement if all vacant plots or rooftops in urban areas are utilized (Smith, 2010).

Like many other parts of the world, UA is also practiced in Africa. According to the UND (1996), 80% of families in Libreville (Congo), 68% of urban dwellers in six Tanzania cities, 45% in Lusaka (Zambia), 37% in Maputo (Mozambique), 36% in Ouagadougou (Burkina Faso) and 35% in Yaounde (Cameroon) are involved in urban agriculture. Regardless of the accuracy of these statistics the message is clear that in both developed and developing countries UA can contribute significantly to the livelihood of many people.

Despite the potential of UA in food security and income generation, some countries still not formally recognize it (Mireri, 2002). As a result there are limited credit and investment opportunities to effectively spur its growth and development (Mireri, 2002). As results UA farmers do not benefit from UA activities because they can't produce to the potential and sell to appropriate markets. With its potential as a significant source of both nutrition and employment for the urban poor, urban agriculture deserves to be taken seriously by city authorities and development

agencies alike (Foeken & Owuor, 2006). Little information about UA could be among the reasons for its little attention and condemnation. Also UA if not well managed can cause environmental degradation as well as health problems. In order to address these challenges there is a need of more information about Urban Agriculture.

## **1.2 Statement of the problem**

Urban dwellers in Tanzania like other parts of the world are faced with many challenges including ever increasing costs of living and decreasing of employment in formal sectors (Shimbe, 1997). As a response to the situation urban dwellers have opted to urban agriculture in which they grow different types of crops as well as livestock keeping (Mougeot, 2005).

UA in Tanzania has been growing to the extent that it contributes almost 30% to household food needs of the people in urban areas (Kitilla & Mlambo, 2001). It is reported that on average 74% of urban dwellers practice UA by keeping livestock or growing different types of crops (Schiere et al. 2006). Urban agriculture forms at least 60% of the informal sector and is the second largest urban employer constituting about 20% of those employed in urban areas (UNDP, 2008). The number of families engaged in urban farming from 1967 to 2012 is estimated to have grown from 18 to 68% (Aylet, 2012).

Despite the facts that urban agriculture in Tanzania is growing and has a potential contribution to economic development, it has not been given formal attention as a catalyst for urban development (Jacobi, 2000). Information about its actual contribution to people's livelihood is limited hence lack government support (Jacobi,

2000). In some urban areas it is viewed as illegal activity due to claims that it causes environmental degradation. However, there is inadequate information to support these claims or propose measures for improvements.

There is also limited information on the types of UA practiced as well as the characteristics of urban dwellers who are involved in urban farming. This study intended to fill the identified gap, by examining the contribution of Urban Agriculture to people's livelihood and its impacts on environmental degradation using Dodoma Municipality as the case study.

### **1.3 Research objectives**

#### **1.3.1 General objective**

To assess the contribution of Urban Agriculture to household's livelihood in Urban areas.

#### **1.3.2 Specific objectives**

- (i) To identify the types of Urban Agriculture practiced in the study area.
- (ii) To analyze the characteristics of household involved in Urban Agriculture
- (iii) To ascertain the contribution of Urban Agriculture on household's food security and income generation.

### **1.4 Research Questions**

- (i) What are the types of Urban Agriculture practiced in the study area?
- (ii) What are the contributions of Urban Agriculture to food and income generation at household level?
- (iii) What are the characteristics of the household involved in urban farming?

### **1.5 The significance of the study**

The study generated knowledge on the contribution of urban agriculture in improving food security and income among the households.

Results from the study is useful to various practitioners, researchers, policy makers and other agricultural stakeholders to prepare or plan relevant policy and strategies that ensure effective contribution of UA to poverty reduction efforts in urban areas.

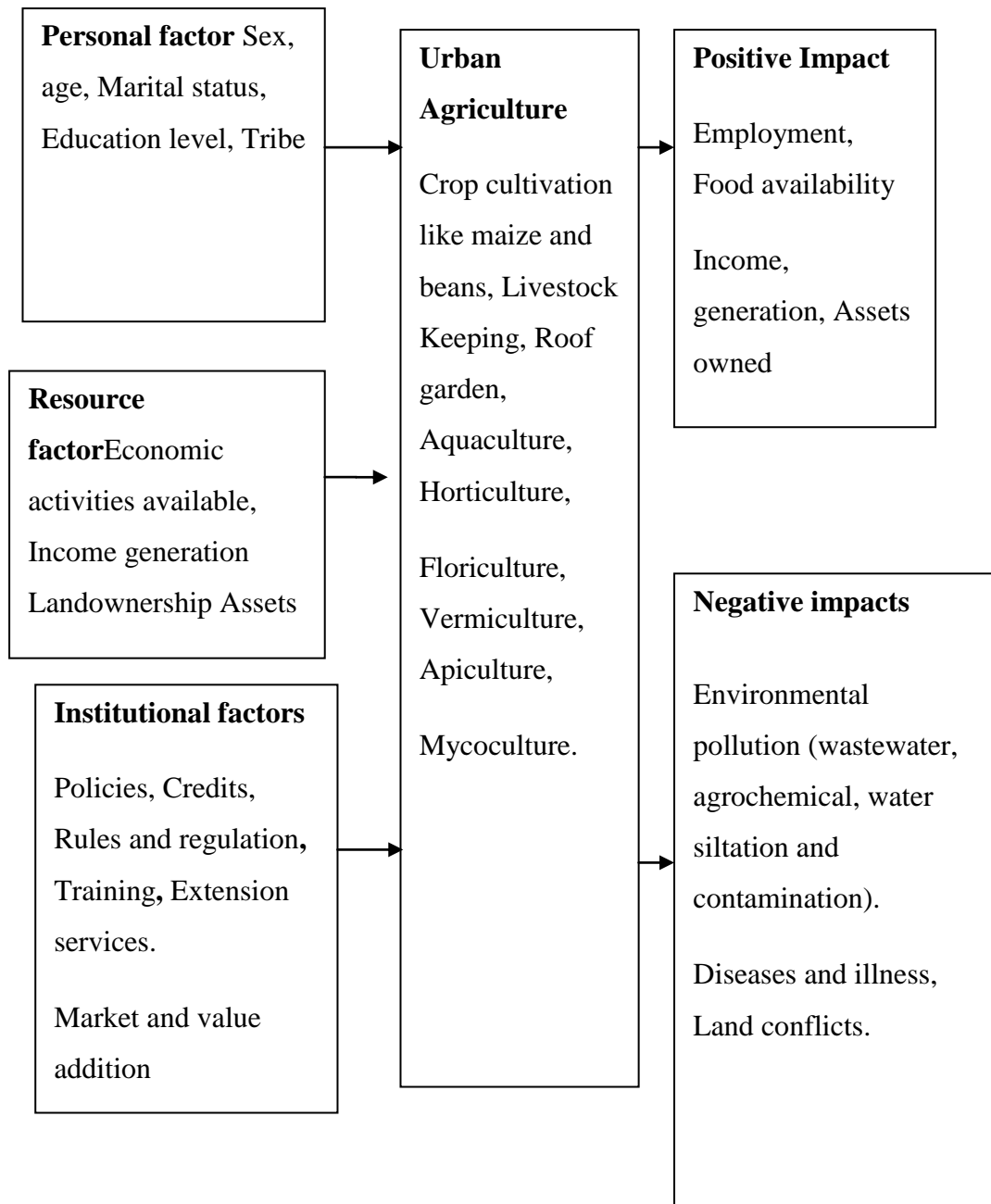
### **1.6 The conceptual framework**

The study was guided by the conceptual framework depicted in Figure 1. The conceptual framework is showing how urban agriculture can be a vital strategy for improving people's livelihood in urban areas. The conceptual framework shows factors that influence involvement and performance of UA as independent variable and the outcome after involvement and performance of UA as dependent variable.

UA contributes to poverty alleviation by creating employment, generating income and providing food as well as ability to meet social needs among the people who are involved in the sector.

However, involvement in UA and the contribution of UA to food security and income generation depend socio-economic factors (dependent variable) which include personal characteristics (e.g. sex, age, marital status and education level) and resource factor eg economic activities available, income, land ownership, assets and labor institution characteristics which include existing policies, rules and regulation, credits facilities, training and availability of extension services affects the contribution of UA. Independent variable which are outcomes of the involvement and performance of UA includes Creation of employment, income generation and food security. There are also

possible negative outcomes which include environmental pollution (wastewater, agrochemical wastes, siltation and water contamination) as well as conflict over land.



**Figure 1: Conceptual framework on the contribution of urban agriculture on improving people's livelihood.**

## **CHAPTER TWO**

### **LITERATURE REVIEW**

This section focuses on the review of different literatures; it gives the imminent into various studies that have been done by various scholars regarding Urban Agriculture. The chapter reviews the Urban Agriculture at global level, developing countries including Africa and Tanzania. The review includes the situation of Urban Agriculture in Tanzania in terms of income generation and food security specifically in Dodoma urban. Finally the chapter provides knowledge gaps in relation to Urban Agriculture.

#### **2.1 Definition of key concepts**

##### **2.1.1 Urban agriculture**

Urban Agriculture (UA) is the practice of crop production and livestock keeping in or around urban areas (town and cities). Urban agriculture can also involve aquaculture (Bailey, 2000).

##### **2.1.2 Poverty alleviation**

Poverty alleviation means strategies of making basic needs more available or increasing disposable income needed to purchase those needs (UNDP, 2008).

##### **2.1.3 Food security**

Food Security means that all people at all times have physical & economic access to adequate amounts of nutritious, safe, and culturally appropriate foods, which are produced in an environmentally sustainable and socially justifiable manner, and that people are able to make informed decisions about their food choices ( WHO, 2015).

### **2.1.4 Environmental degradation**

Environmental degradation is the deterioration in environmental quality from ambient concentrations of pollutants and other activities and processes such as improper land use and natural disasters (Johnson et al, 1997)

### **2.2 Urbanization and Urban Agriculture**

The number of people around the world who live in and around cities is increasing rapidly such that city authorities around the world face enormous challenges in creating employment, in providing basic services in maintaining green spaces, managing urban wastes and waste water in decentralization and creation of efficient local autonomy.

Food and energy crisis are making hundreds of millions of people living in urban areas more vulnerable to hunger and poverty as a result of rapid urbanization facing unemployment opportunities. According to various estimates of the Food and Agriculture Organization of the United Nations (FAO, 2008), the number of hungry people worldwide was 963 million which is changing according to time or about 14.6 per cent of the estimated world population of 6.6 billion, representing an increase of 142 million over the figure for 1990- 1992. Cities are quickly becoming the principal territories for intervention and planning of strategies that aim to eradicate hunger, poverty and improve livelihoods (Hussein, 2002). Among the intervention and planning strategies dealing with rapid urbanization challenges is Urban Agriculture.

It is estimated that by 2020 the developing countries of Africa, Asia, and Latin America will be home to some 75% of all urban dwellers. Most cities in developing

countries will have difficulties in coping with this development due to inability to create sufficient formal employment opportunities for the poor. They will also face increasing problems with the disposal of urban wastes and waste water and maintaining air and river water quality. It is expected that by 2020, 85% of the poor in Latin America, and about 40-45% of the poor in Africa and Asia will be concentrated in towns and cities. This rapid urbanization goes together with a rapid increase in urban poverty and urban food insecurity. Indeed, it is now widely accepted that poverty should not be seen only as a lack of income, but also as a deprivation of human rights and that hunger constitutes a violation of the human right to food. For example 2008 was the year in history that the world's urban population of more than three billion people exceed and the number of those living in rural areas.

As most of the people are migrating from rural to Urban areas the life becomes difficult whereby most of the people lives in slums and food security becomes a problem. In many cities of sub-Saharan Africa they account for three quarters of all urban residents and in Latin America and Caribbean 60% of the poor (113 million people) live in cities (FAO, 2008). By 2030, some two thirds of the world's people will be living in cities, according to UN projections. Hence as the population increases the demand of food increase as well which leads to the need of producing enough food for the ever increasing Urban population. Urban Agriculture becomes a solution to food insecurity as well as increasing the income of the poor urban dwellers.

Urban agriculture is one of the many different strategies developed by urban citizens to improve their livelihoods and is often combined with other activities. Much urban

agricultural production takes place in the informal sector. In West Africa, market oriented irrigated agriculture occupies between 20 and 650 ha in each major city, producing 60-100% of the locally consumed perishable vegetables (Obuobie et.al, 2006). It is often a response of the urban poor and unemployed to urban poverty and food insecurity/ malnutrition. Since poor people generally spend a substantial part of their income on food 60–80% (Mougeot, 2005), the savings made by substituting home grown vegetables can be substantial. In addition it may contribute to sustainable urban development, by turning urban wastes into a productive resource through compost production and irrigation with wastewater and by greening the city. It also functions as an important strategy for poverty alleviation, community building and social integration of disadvantaged groups. However, if not properly managed, it may include risks, especially in the aspect of water reuse.

### **2.3 Role of urban agriculture**

UA can be a profitable undertaking at the household level, especially when producing products that are high in demand and that have a comparative advantage over rural production such as perishable products (e.g. green leafy vegetables and milk), mushrooms, flowers and ornamental plants. Urban animal husbandry can also be a profitable business although the investments in commercial livestock production requires higher start-capital (Mireri, 2002).

Urban farming is helpful activity which increases household income through selling of agricultural products and ensuring food security. Many cases demonstrate that urban farmers make rational decisions on their production system and strategies by taking up higher-risk intensive vegetable production or by obtaining better returns per dollar invested by maintaining diversity and using fewer external inputs.

UA is part of the urban ecological system and can play an important role in the urban environmental management system by protecting the environment, reducing the amounts of waste that need to be transported out of the city, reducing the city's ecological footprint, and Contributing to greening of the city. The fast-growing cities produce more and more wastewater (Bailey, 2002) and organic wastes making waste disposal a serious problem for most cities (Cofie *et al.*, 2006). UA can contribute to solving such problems by turning urban wastes into a productive resource. The use of fresh (untreated) wastewater offers an additional advantage for poor urban farmers, because it contains many nutrients, although often not in the proportions required by their soils and crops. In particular, in and around cities in arid and semi-arid zones, the use of urban wastewater can be very important (Cofie *et al.*, 2006).

Throughout the developing world, and especially in Africa, animals are an important physical and financial capital for many urban households (Moustier and Danso, 2006). In Addis Ababa, Ethiopia, 20 million liters of non-pasteurized milk came from backyard city farms and are sold directly to the consumer by the producer. Above-normal profits are earned with very low capital input by even the smallest-scale backyard owners of inner city dairy units, who are generally women (SIDA, 2003). As a regular source of income, they represent a form of savings. They may also generate additional physical capital in the form of manure (Ravallion *et al.*, 2007).

### **2.3.1 Urban Agriculture and food security**

The contribution of UA to food security and healthy nutrition is probably the most important asset. Food production in the city is often a response of the urban poor to inadequate, unreliable and irregular access to food and lack of purchasing power. In

urban settings, lack of income translates more directly into lack of food than in rural settings. The costs of supplying and distributing food from rural areas to the urban areas, or to import food for the cities, are rising continuously, and distribution within the cities is uneven. As a consequence, urban food insecurity increases (Argenti, 2000). In addition to enhanced food security and nutrition of urban producers themselves (Nugent, 2000), large quantities of food are produced for other categories of the population. It is estimated that 200 million urban residents (FAO, 2008) produce food for the urban market providing 15 to 20 percent of the world's food (Amar-Klemensu, 2002). Therefore the improvement in UA activities will reduce the life challenges in Urban areas, by improving food availability. Some of UA products like vegetables are fresh consumed hence transporting them in far distance can become a challenge hence there is a need to grow them in Urban areas instead of depending on rural areas to provide them.

### **2.3.2 Urban Agriculture and local economic development**

UA is an important source of income for a substantial number of urban households. In addition to income from sales of surpluses, farming households save on household expenditures by growing their own food, which can be substantial since poor people generally spend a sizeable part of their income (50–70 percent) on food. UA also enhances the development of microenterprises in the production of necessary agricultural inputs (e.g. fodder, compost, earthworms), the processing, packaging and marketing of products (Foeken and Owuor, 2006) and the provision of services such as animal health services and transportation (Moustier and Danso, 2006).

### **2.3.3 Urban Agriculture and Social impacts**

UA may function as an important strategy for poverty alleviation and social integration of disadvantaged groups (e.g. HIV/AIDS-affected households, disabled people, female-headed households with children, elderly people without pensions and jobless youth), with the aim to integrate them more strongly into the urban network, provide them with a decent livelihood and prevent social problems such as drugs and crimes (Beatley, 2000). Urban and peri-urban farms may also assume an important role by providing recreational and educational activities to urban citizens or in landscape and biodiversity management and community building (Smit et al, 1997).

### **2.3.4 UA and urban environmental management**

Waste disposal has become a serious problem for most cities. UA can contribute to solving this and related problems by turning urban wastes into productive resources (Cofie et al 2006). Compost production and irrigation with wastewater. UA and forestry may also positively impact on the greening of the city, the improvement of the urban micro-climate (wind breaks, dust reduction, shade) and the maintenance of biodiversity (Danso et al, 2003). Urban Agriculture may also reduce the city's ecological footprint by producing fresh foods close to the consumers, thereby reducing energy use for transport, packaging and cooling among others.

### **2.4 Risks associated with urban agriculture**

UA may also have negative effects if improperly conducted and proper preventive and guiding measures not taken. The main risks include the following.

### **2.4.1 Health risks**

Review of the available literature indicates that although insight into the potential health risks of UA is growing, but detailed information on the actual health impacts of UA is not clear as urban areas are complex in terms of activities therefore identifying risks from UA alone is difficult (Obuobie et al, 2006). The associated health risks of UA should be taken seriously and a number of actions carried out including adequate regulating and preventive measures. To avoid exaggerated reactions, however, the fear of contaminated food and other health risks associated with UA should be compared with those of rural agriculture. The main health risks associated with UA can be grouped into the following categories. Contamination of crops with pathogenic organisms caused by irrigation that uses water from polluted streams, or inadequately treated wastewater, or to the unhygienic handling of the fresh products during transport, processing and marketing (Beatley , 2000).

Human diseases transferred from disease vectors attracted by agricultural activity such as breeding of mosquitoes, plague, lime and tick-born diseases. Contamination of crops and drinking water by residues of agrochemicals (fertilizers, pesticides, fungicides). Contamination of crops by heavy metals from contaminated soils, air or water caused by heavy traffic, and industry; transmission of diseases from domestic animals to people (zoonosis). Occupational health risks, for example, through improper handling of agrochemicals and untreated wastewater in food production and food-processing industries.

### **2.4.2 Environmental impacts**

UA may contaminate local water sources if large amounts of chemical fertilizers and pesticides are used. Also the excessive use of nitrate-rich manure, such as chicken or

pig manure can contaminate groundwater. In particular, wastewater discharge from intensive poultry farms can carry heavy loads of micro-organisms and may contaminate drinking water supplies. Further, under certain situations, inappropriate farming practices may lead to reduction of vegetation and siltation of water bodies (Bowyer-Bower et al 1996). Because of the undervaluation of UA and stiff competition for land, UA is often pushed back to marginal areas within the city, such as wetlands and hill slopes, where it may harm the fragile ecosystems if not properly guided.

### **2.5 Environmental Risks in Urban Agriculture**

Many of the environmental or ecological benefits of Urban Agriculture are not quantified in various literature as measurable benefits exceeds the costs (Nurgent, 1999). Costs and benefits of Urban Agriculture in restricted analysis to a comparison of monetarily measurable inputs and outputs. However monetarily measurable benefits exceed the costs, to acknowledges its limitation by exclusion of important factors such as environmental externalities, multiplier and social effects provides only a partial conclusion concerning urban and peri-urban agriculture. For the most part, the environmental benefits are listed as given rather than as a theory that requires proof.

### **2.6 Dynamics of urban agriculture**

The development of UA is strongly influenced by the dynamics of the urban social, economic, Political, ecological and spatial systems within which it is connected. People increasingly live in and around cities throughout the world. In ‘State of the World Cities’ UN-HABITAT predicts that by 2030, 60 percent of the world’s

population will live in cities. The growth of cities, or urbanization, is caused by migration from the rural areas to the cities' and natural growth of the urban population (Drescher and Iaquina, 1999). The latter is gradually becoming the dominant one in most cities.

### **2.6.1 Urban authorities, poverty and food insecurity**

City authorities around the world face enormous challenges in creating sufficient employment, providing basic services such as drinking water, sanitation, basic health services and education, as well as planning and maintaining open green spaces. Other challenges include managing urban wastes and wastewater, as well as social inclusion, decentralization and local autonomy, among other issues. UN-HABITAT stipulated that in 2001, nearly 32 percent of the world's urban population lived in irregular settlements without sufficient access to decent food, shelter, water and sanitation, and predicted that in the next 30 years the number of slum dwellers worldwide will increase to two billion if no action is taken (UN-Habitat, 2001).

As urbanization develops, there is an increase in urban poverty, food insecurity and malnutrition, shifting from rural to urban areas. People without resources and social networks are most vulnerable to food insecurity. Food has become increasingly difficult to access for the urban poor, especially in the bigger cities (Mougeot, 2005). Food insecurity can be measured at many levels from the individual all the way to a region or country. Rapid urban expansion that races ahead of the requisite infrastructure and service systems, including the food system, engenders food security. This is particularly true for essential protein and micronutrient elements of the diet. Food insecurity has most commonly been measured at the household or family level, whereby effort to food security is most commonly access to good food.

Access, compared to availability, implies that the family has either money or direct access through self-production or barter. Availability within the city or market does not provide access. In developed economies, food insecurity tends to be co-located with poverty, while in underdeveloped economies the spatial patterns of food insecurity are more dispersed (USDA, 2000). Urban agriculture as an agent of food security can be effective throughout a city, core to periphery, and thus has special relevance in low-income countries. The experienced poverty that result into food insecurity leads to malnutrition, morbidity from diarrheal diseases and parasitic infections, and infant mortality are up to three times higher in lower income areas than in upper income areas.

Food security is becoming an increasingly critical issue as the rate of urban poverty rises, and evidence indicates that food security and nutrition are worse among the urban poor than the rural poor. It was found by USDA (2000) that poverty is increasing in urban areas more than in rural, and mostly poverty is shifting to urban areas. Although on average the nutritional status of children (stunting and underweight) is better in urban than in rural areas, intra-urban differentials among the rich and poor are very high (USDA, 2000).

Moreover, poor urbanites often pay more for food than richer urban residents because they purchase small quantities and must travel further to reach places where food costs less. In most low-income cities, non-farmer food costs represent a substantial share of total household expenditures. In urban areas of low-income countries, 40-70 percent of the family budget is spent on food and fuel. The poorest people in those cities often spend 60-90 percent of their budgets on food, often facing hunger when they cannot afford such price levels (Marie et al; 1998). Thus

urban agriculture can make a substantial contribution to the economy of poor urban households.

### **2.7 Interdependence of UA with rural agriculture**

Researchers and planners have gradually come to recognize that there is no clear border between urban and rural areas and that it is more realistic to think in terms of a continuum of rural and urban features, both in the physical and organizational sense. Several authors have shown that UA to a large extent complements rural agriculture and increases the efficiency of the national food system since it provides products that rural agriculture cannot supply easily (for example, perishable products, products that require rapid delivery upon harvest), can be a substitute for food imports, and can release rural lands for the production of export commodities.

However, distinguish between Urban-Peri urban Agriculture (UPA) and rural agriculture. Frequently people fail to encountered differences between UPA and rural agriculture, which have important consequences for the design of policies and support programs. UA tries to complement supplies from rural areas and should be supported to do so. According to Moustier's (2005) vegetable-supply system of Bissau showed that urban production promoted by the government to diversify and buffer the seasonality of supplies to the city has been truly complementing other (rural and foreign) sources. West African cities also frequently offer better conditions for breeding, sheltering, watering or fattening livestock otherwise kept in rural areas. Stevenson et al (1996) found that the urban, peri-urban and rural zones complemented each other in supplying specific produce to the city of Dar es Salaam. Tomatoes, African eggplant, cabbage and onions come from rural locations. Also the

inability of rural production to meet the growing urban demand of food is a challenge that is stimulating the need to improve UA activity.

## **2.7 Urban Agriculture in Tanzania**

### **2.7.1 Crops and livestock production**

Like in many other countries Urban agriculture is also practiced in Tanzania whereby urban dwellers produce food, earn extra income using available land and labor resources (Mlozi 1995). Urban agriculture in Tanzania involves raising of livestock (dairy cattle, chickens, goats, pigs, etc.) and cultivation of crops (maize, cassava, legumes, vegetables, fruits, etc) (Mourgeot 2005). Urban agriculture is under-taken for both subsistence and commercial purposes and has evolved to the point where it is regarded as a survival strategy for the urban poor and an economic imperative for wealthier households. UA is seen as especially important for low-income households and for female-headed households in particular household (Mourgeot, 2005). The gender aspect is thought to be important because land and title deeds to land are less easily accessible to women and they are also less likely to use modern farming techniques and or inputs as they are less educated compared to men and culturally neglected to resource ownership.

Urban Agriculture helps in raising income among the people engaged to it example the vegetable producers who gain income throughout the year by selling their UA produces. On the side of non-income poverty there is an increase in quantity of vegetable produced, increase in food security, as well as improvement in accessibility and affordability of health and education services. To make the

horticulture activities sustainable, it is recommended that, relevant authorities including the Municipal authorities to make deliberate efforts in improving access to land, by legally allocating specific areas for horticulture in the Municipal, improving urban extension services, and reducing price of agricultural inputs.

Keeping livestock in town is as common as cultivating crops. In the mid-1990s, there were some 18,000 cross-bred dairy cattle, 37,000 pigs, 40,000 goats, 1.2 million laying and 0.6 million broiler chickens, 132,000 local fowl and 37,000 ducks within Dar es Salaam's city boundaries. Over half of all these were kept in the built-up area (Mlozi, 1996). Compared with the numbers only ten years before, the number of dairy cattle had increased fourfold, chicken 3.5-fold, pigs 4.5-fold and goats 15-fold (Mosha, 1991). In general, livestock raising is more intensive where housing density is lower (Mlozi, 1997). In the city's low-density, high-income neighborhoods, people run quite successful cattle and chicken enterprises. In Morogoro, too, thriving dairy, poultry and pig farming was observed (Shimbe, 1997).

### **2.7.2 UA and Economic growth in Tanzania**

According to different statistics of international organizations (e.g. UNDP 1997, World Bank 1993), poverty is widespread in Tanzania. The Tanzanian Government claims that 39% of the urban population is poor. The dramatic growth of population is one main reason for this fact. Involvement in the informal economy has become a strategy for survival for the unemployed, the low wage earners and for women without sufficient skills to secure well-paid jobs. About 56% of the urban population are absorbed by the informal sector. Urban survival strategies with regard to food production can still be regarded as a fairly unexplored field of research. One

important strategy for urban dwellers to improve income and food supply is to practice urban agriculture tract of land.

Dar es Salaam is by far the most important urban center in Tanzania. With rapid urban growth the city accounted for about 35% of the total urban population of Tanzania which is changing according to time (Mlozi 1997). It was seven times larger than the country's next urban center, Mwanza. It is the main destination in rural-urban migration, which the country has witnessed since its political independence in 1961 (Nelson, 1996). Rural-urban migration and natural growth equally share the increase in Dar es Salaam's population to date (Manyatsi, 2005).

### **2.7.3 Rules and regulation governing UA in Tanzania**

There are several policies, rules and regulations governing Urban Agriculture in Tanzania for instance, the 1997 Agricultural and Live-stock Policy observes that agriculture is not a principle function of towns but when properly organized it has the potential to provide employment, income and is a complementary source of food supply (Kitilla and Mlambo, 2001).

The Urban Farming Regulations of 1992 gives guidelines, amongst others on the maximum plot size, the number of cattle, the rearing system for livestock, and a prohibition of any farming activity whenever it causes a nuisance (Kitilla, 2001). Further regulations were formulated in the National Human Settlements Development Policy of January 2000 for instance by designating special zones for urban agriculture, granting legal rights for the people involved in farming in these zones, as well as facilitating the construction of appropriate infrastructure in these

areas (Mlozi, 2001). These measures were at the same time meant to prevent a disruption of planned urban development.

The regulation on urban agriculture lies with the urban authorities. By-laws regulating both crop cultivation and livestock keeping exist in all Tanzanian towns and municipalities, and specific by-laws forbid the planting of crops in designated areas or restrict the planting of certain crops. For instance, crops taller than one meter are forbidden, thus includes maize – one of the most common crops in Tanzanian towns. Penalties for breaking these by-laws are clearly laid out (Mlozi, 2001). By-laws concerning the keeping of animals include the required purchase of a special permit from the Town or City Director. a maximum of four head of cattle, only to be kept in zero-grazing and in specific structures and the compulsory removal of manure, liquid waste material and other animal waste ( Mlozi 2001).

However, virtually all the by-laws are ignored by most urban farmers (Nabulo et al; 2004). Besides the mere fact that the municipal authorities do not have the means to effectively enforce them, there are other reasons as well. The very people who are supposed to see to it that the laws are enforced are the ones violating them according to Sawio (1993). Hence it appears impracticable for a junior officer to punish his or her boss who is found violating the law. Many senior officials living in the high-income, low-density areas of Dar es Salaam keep more than the permitted four head of cattle and allow them to graze openly on public land (Sawio, 1993).

Another important legal factor concerns land tenure. In general Sarris et al (2006) land tenure has a long-term influence on the sustainability of urban agriculture clear property rights determine producers' willingness to invest in crop production, for

instance the cultivation of perennials, irrigation systems, soil and crop improvement measures. In Tanzania, “all land is officially controlled by the state which in turn grants rights of use and occupancy to different segments of the society including individuals, villages, companies, parastatal organizations and various investors” (Mlozi, 2001). As land ownership determines the willingness to be involved in UA activities therefore land tenure plays a significant role in improving UA activities.

That’s why most of cities are opting to UA activities so as to overcome the food shortage as a result of urbanization not only that but also urban farmers are engaged to it in order to earn income. For the case of Dar Es Salaam, UA production creates employment, income and food expense savings whereby during 1990, 90% of leafy vegetables produced in the city, 60% of milk 16%, 44% peri-urban, 20-30% of food consumption produced in 50% of households (Mougeot, 2005). Some cities in Tanzania like Dar es salam UA has started receiving attention and support on various policy levels and is accepted as a land use in the city. In the Strategic Urban Development Plan (SUDP), special land-use zones have been designated for Urban Agriculture (Mougeot, 2005). In 2000 poultry production was 2.6 million, pigs, 60,654, goats: 90,786, the city’s policy makers found that agriculture in the city contributed in household food supplies and that it had become integral part of urban livelihood strategies (Kitilla & Mlambo, 2001), 74% of urban farmers keep livestock (Schiere et al. 2006). Urban agriculture forms at least 60% of the informal sector and urban agriculture is the second largest urban employer 20% of those employed (Cofie et al. 2003).

## **2.8 Knowledge Gap**

The literature that has been reviewed shows that Urban Agriculture is taking place and is growing in many developing countries including Tanzania. Urban Agriculture plays a significant role in improvement of livelihood through enhancing food security as well as income generation.

However, the extent to which Urban Agriculture is contributing to livelihood improvement is not adequately covered as well as the impacts of Urban Agriculture on environment.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Selection of the study sites**

This study was conducted in Dodoma Municipal. Dodoma region was selected among 30 regions in Tanzania since it is among the regions facing challenge of prolonged drought which frequently result into food insecurity, UA has been the option. Dodoma Municipality is also experiencing high and rapid urban population growth due to opening of several academic institutions that have attracted relative large population with increased demand for food, employment and market for UA

produces. Four wards namely Kikuyu North, Kikuyu South, Kilimani and Mkonze were selected for this study because of the relatively large proportion of residents involved in UA.

### **3.1.2 Description of the study sites**

#### **3.1.2.1 Location**

Dodoma region is located at 6° 11' 0" South, 35° 45' 0" East coordinates in the center of the country, Dodoma town is 486 kilometers west of the former capital Dar es salaam and 441 kilometers south of Arusha the headquarters of the East African community It covers an area of 2,669 square kilometers of which 625 square kilometer is urbanized (PHC, 2012).

Dodoma Municipality is one the seventeen municipalities in Tanzania-but with major difference of being the capital of the united Republic of Tanzania and the substantive seat of the Union Parliament. It is one of six administrative districts that makes up Dodoma region. It is located in the center of the region, totally surrounded by Chamwino and Bahi. It covers an area of 2,769 square km of which 625 are urbanized. Four wards that have been selected which are located along Iringa road thus Kikuyu South, Kikuyu North, Kilimani and Mkonze which are among 30 Dodoma urban wards. The administration of Dodoma urban is sub divided into 30 wards where by others are Viwandani, Uhuru, Chamwino, Kiwanja cha ndege, Makole, Miyuji,, Msalato, Makutopola, Ng'ong'ona, Mpunguzi, Tambukaleli, Mbabala, Zuzu, Hazina, Madukani, Majengo, Kizota, Nala, Mbalawala.

### **3.1.2.2 Population**

The population of Dodoma Municipality is estimated to be 424,347 (Tanzania population & Housing Census 2012). Dodoma is populated by different ethnic groups because it is a government administrative Centre, although the indigenous ethnic groups are the Gogo, Rangi and Sandawe There are also small Arabs and Indians minorities.

### **3.1.2.3 Climatic condition**

Dodoma features a semi-arid climate with relatively warm temperatures throughout the year. While average highs are somewhat consistent throughout the year, average lows dip to 13 °C (55.4 °F) in July. Dodoma averages 570 mm of precipitation per year, the bulk of which occurs during its wet season between November and April. The remainder of the year comprises the city's dry season (TMA, 2014).

## **3.2 Research Design**

Research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Orodho et al, 2002). It ties together all elements related to research questions as scheme plan which guides the intended result of the study. This study employed cross-sectional survey design using both qualitative and quantitative approaches. Cross-sectional surveys as it takes place at a single point in time also allowing the researcher to look at numerous things at once. This research design was selected due to its flexibility in the methods of data collection and analysis. It is also the simplest and least costly design compared to other designs (Cohen, 2000).

### **3.3 Sampling Procedures**

#### **3.3.1 Target Population**

The target populations for the study are urban farmers, UA customers, extension officers, urban planners and Local Government Officers in urban areas.

#### **3.3.2 Sampling frame**

A sampling frame is a list of all elements in the population. The sampling frame defines a set of elements from which a researcher can select a sample of the target population (Orodho, 2005). The sampling frame for this study was population of Dodoma Municipality while the sample unit for this study covered a list of the head of household in the study area obtained from their local leaders. The list for key informants (extension officers, CDA planner) was obtained from their respective offices.

#### **3.3.3 Sample size**

The study used a sample size of 123 respondents who were obtained from the population of Dodoma Municipality estimated to be 424,347 people. Equation 1 as described by Rwegoshora (2006) was used to estimate the sample size.

$$n = N / 1 + N (e) \dots\dots\dots (1)$$

Where by

n = sample size

N = Total population

e = error of detector (1-10%)

1 = Constant

Using the population of 424,347 and error detection of 10% the estimated sample size was 123 respondents. In addition to the sample size of 123 from household 3 key informants was involved in the study. Key informants included 2 extension officers from regional and district offices and 1 planner from Capital Development Authority (CDA). The sample was distributed depending on their proportion in the population. Table 1 presents the summary of the distribution.

**Table 1: Respondents Category and Distribution**

Category	Respondents				Total
	Kilimani	Kikuyu N	Kikuyu S	Mkonze	
Agricultural	–	–	–	–	2
Extension Officers					
Planner from CDA	–	–	–	–	1
Household representative	31	30	32	30	123
<b>Total</b>	30	30	32	30	126

### 3.4. Sampling procedures

Sampling is a process of selecting a group of people, events, behavior or other elements with which to conduct a study. There are two common sampling procedures named probability and non probability sampling. The study used both probability and non-probability sampling procedures as stipulated by Rwegoshora, (2006). Probability sampling is a technique where every individual or group of the universal has an equal chance of inclusion in the sample (Olembo, 2005). Probability sampling specifically simple random sampling was used to select the household representatives. Non probability sampling is the process whereby respondents are selected purposely based on their reachness in information required by the research.

(Kombo and Promp, 2006). Non probability sampling specifically purposive sampling was used to select the key informants for the purpose of getting in-depth information on the subject matter. The criteria used in selecting the key informants based on the relevance of professionalism and experience in dealing with issues related to UA.

### **3.5. Data collection**

#### **3.5.1 Data sources**

The study drew data from both primary and secondary data sources using interviews, observations, Focus Group Discussion and documentary review methods.

##### **3.5.1.1 Secondary data**

Secondary data was obtained from available literature. An in-depth study of relevant literature on the research topic was undertaken. Data was gathered through published and unpublished materials such as text books, journal papers, internet search and government documents from various institutions including Capital Development Authority, Regional offices, District offices, Ward offices and relevant websites.

##### **3.5.1.2 Primary data**

Under this source information was gathered directly from respondents through interviews, Focused Group Discussions and Observation methods.

#### **3.5.2. Data collection methods**

Data collection refer to gathering specific information aimed at providing or refuting some facts (Kombo and Tromp, 2006). Data were collected by using interview, observation and focused group discussion

### **3.5.2.1 Structured Interviews**

The researcher administered structure interviews using questionnaire to the Urban farmers (Kombo and Tromp, 2006). This structured interview was administered to the household's respondents using questionnaires. The questionnaire contained both closed and open ended questions (Appendix 1 and Appendix 3) as an approach to get a complete and detailed understanding of the issue under research. Open ended questions were used because they provide freedom for respondents to give answers in their own words, providing more information including feelings, attitudes and understanding of the subject. Closed ended questions helps the researcher during analysis of data as they are more easily to analyze, take less time, more specific, likely to communicate similar meanings (Kombo and Tromp, 2009).

### **3.5.2.2 Individual in Depth Interview**

In- depth interview were conducted to key informant with the help of a check-list (Appendix 2). Data was recorded using prepared coding schedule by the researcher (Kothari, 2004).

### **3.5.2.3 Observations**

Observation is a method of data collection where by the researcher is able to observe direct operations of the activities. The use of this method helped to get the information, experience a situation in the field and to cross check information obtained from other data collection methods (Adam and Kamuzora, 2008). Observation helped to decrease depending on respondent's willingness and ability to report accuracy as well as interviewer biasness. Non participant observation was applied to observe the type and means of conducting UA activities. An observation

was done to the number of behaviors with the help of check list for Urban farming activities and customers preference. The method used tools such as note taking and picture taking.

#### **3.5.2.4 Focused Group Discussion**

Focused Group Discussion (FGD) can produce a lot of information quickly and are good for identifying and exploring beliefs, ideas or opinions in a community (Kombo and Tromp, 2006). FGD was conducted from the household representative in four different groups each containing not more than 10 people in each ward. Male respondents were separated from female during discussion to give each group freedom of expression. The Discussion was guided by the checklist (Appendix 4).

### **3.6 Types of Data collected**

Specific data sets collected for each objectives are as indicated in the following section.

#### **Objective 1: The types of Urban Agriculture practiced in the study area**

Data that were collected for this objective include the type of Urban Agriculture that is taking place in the area. Management of UA farms in terms of inputs and outputs whereby UA activities are taking place and the yields or production level.

#### **Objective 2: Characteristics of households that are involved in Urban Agriculture**

Data collected included personal characteristics (age, sex, house hold size, marital status, education and tribe). Data on Institutional characteristics which included

policies, credits, rules, regulation and training. Other type of data included resource such as economic activities labor availability.

### **Objective 3: The contribution of UA on the livelihood**

Specific data for this objective included the number of household members, income from Urban Agriculture and the reason for involvement in Urban Agriculture. It also included expenditure of income from UA, situation of food security number of household members involved in UA, ownership of UA resources, economic activities of the respondents and employment creation.

## **3.7 Data Processing and Analysis**

### **3.7.1 Data Processing**

The data collected were edited in order to detect and omit errors followed by coding for analysis

### **3.7.2 Data Analysis**

Data analysis refers to the computation of certain measures along with searching for patterns of relationship that exist among data groups (Kothari, 2004). Frequencies and percentage were computed and used to analyze the proportion of respondents regarding the variable of interests/ social economic variable. Cross tabulation was applied to compare variables between and within respondents groups/ categories. Furthermore, content analysis was applied to analyze qualitative data from key informants. Responses were identified and grouped in different themes related to research objectives.

### **3.8 Reliability and Validity**

Reliability and Validity are essential to the effectiveness of any data-gathering procedures. The validity is that quality of data-gathering instruments or procedures that enables it to measure what is supposed to be measured, and reliability is the degree of consistency that instrument or procedures demonstrates (Richards, 1999). The following measures were taken to ensure reliability and validity.

#### **3.8.1 Reliability**

To ensure reliability pre-testing of the questionnaire was conducted before full scale data collection as well as training of research assistant.

#### **3.8.2 Validity**

Validity of a questionnaire is the degree to which the tool is actually measuring or collecting data about what it should be measuring or collecting. (Kirakowsk, 2000). The validity of data collection tools was assured by using local enumerator, using local language (Swahili) explaining objectives of the study to respondents and ensuring them confidentiality. But also by ensuring voluntarily participation.

### **3.9 Ethical considerations**

The respondents were assured the maintenance of confidentiality of the data provided by individuals and anonymity during the data collection, analysis and reporting. Nevertheless, during filling in the questionnaires, the respondents were asked their willingness to give out their names, and the researcher explained clearly the purpose of the study that was for academic purpose only.

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

#### **4.1 Practice and trends in Urban Agriculture**

##### **4.1.1 Types of Urban Agriculture**

The results in Table 2 show that crop cultivation (96.8%) is the type of UA that is leading in terms of proportion of people involved in it. Mkonze is the leading ward in crop production (100%). Crop cultivation was the leading UA activity because it involves production of crops that are needed by most of the household for food security. The other major type of UA are horticulture (90.5%) which is also having many respondents involved in it as it is used for house hold consumption and for income generation.

##### **4.1.2. Duration in Urban Agriculture**

The results in Table 2 reveal that relatively large proportion of respondents have been engaging in UA activities for 4 -5 years (39%) very few for at least 30 years. Hence it seems that even though it was noted that most of UA farmers are migrants or people born outside the area of current residence they have stayed a long period of time and acquired resources to practice UA.

The results also imply that UA in the study area is not a new activity. However, with the rapid expansion of the Dodoma municipal UA farmers may need to change the type of UA practices due to limited spaces but also due to changing demand.

**Table 2: Types of urban agriculture**

Variable	Description	Respondents (%)				
		Kilimani n = 31	Kikuyu n = 30	Kikuyu S n = 32	Mkonze n = 30	Total N = 123
Type of UA						
	Crop	51.4	96.1	92.2	100	96.8
	Horticulture	31.4	92.6	78.6	71.9	90.5
	Livestock	14.3	89	78.6	71.9	80.5
Duration in (years)						
	4-15	40	39.3	42.9	34.4	39
	16-30	20	32	32	37.5	30
	1-3	28.6	21.4	14.3	21.9	22
	>30	11.4	7	10.7	6.2	8.9

#### **4.1.3 Household members involvement in UA**

The results in Table 3 reveal that female are more involved in UA than male mainly in crop production (82%) and horticulture (85.1%). More female involvement is due to the fact that they are traditionally responsible for family food security and taking care of children hence involved much in UA. Results indicate that males are more involved in livestock keeping than female. This is because traditionally animal husbandry was men's role. However, the difference is not significant. Involvement of more women in UA can also be due to their limited opportunity for other income

generating activities. The results generally indicate that UA can significantly contribute to poverty alleviation among women as they are more involved. Hence efforts to economically empower women can also focus on these different types of UA activities in which they are involved.

**Table 3: Involvement in UA**

Activity	Respondents (%)	
	Female	Male
Animal Husbandry	54.4	42.2
Crop production	82.6	57.0
Horticulture	85.1	17.9

#### 4.1.4 Reason for involvement

Results in Table 4 reveal that most of the respondents (76.2%) are involved in UA activities for food security purpose. Few (15.6%) are involved in UA to supplement their incomes. Very few (8.2%) indicated involvement in UA because of the lack of alternative.

**Table 4: Reason for involvement in UA**

Reason	Respondents (%)				
	Kilimani n = 31	Kikuyu N n = 30	Kikuyu S n = 32	Mkonze n = 30	Total N = 123
Food security	65.7	89.3	67.9	83.8	76.2
Income	40	78.6	46.5	12.9	15.6
No alternative	34.3	67.9	42.9	3.2	8.2

The results show that there are people whose main employment is UA. Hence the government has to take into consideration on how the activity can be recognized and

being identified as one among the activities that can employ people who are lacking employment opportunities.

#### 4.1.5 Trend in UA

Results on the UA trend in the study as perceived by respondents are presented in Table 5. Results indicate that relatively large proportion of respondents (43.8%) indicated fluctuating trend in crop production, but an increasing trend in horticulture (37.7%) and livestock keeping (60.5%). The fluctuation in crop production was explained to be due to the fluctuating trend of rainfall and decreasing availability of areas for crop cultivation.

Decreasing in crop cultivation has led to an increase in horticultural and livestock keeping as they require relatively small area and are relatively more profitable. These observations are similar to the findings by FAO (2008), that Urban Agriculture including horticulture, livestock, fisheries, forestry, fodder and milk production is increasingly spreading to towns and cities. These increase call for the municipality and city planners to consider including UA in their city plans.

**Table 5: The trend of UA production**

Variable	Description	Respondents ( %)				
		Kilimani n = 31	Kikuyu N n = 30	Kikuyu S n = 32	Mkonze n = 30	Total N = 123
Trend of crop cultivation						
	Fluctuating	55.2	20.8	55	43.8	43.8
	Decreasing	31	29.2	30	34.4	31.4
	Increasing	6.9	25	15	18.8	16.2
	Same	6.9	25	0	3.1	8.6
Trend of horticulture						
	Increasing	43.5	25	55.6	16.7	37.7

Same	34.8	43.8	16.7	25	30.4
Decreasing	17.4	18.8	11.1	25	17.4
Fluctuating	4.3	12.5	16.7	33.3	14.5
Trend of animal husbandry					
Increasing	63.6	68.2	57.1	50	60.5
Decreasing	13.6	9.1	7.1	38.9	17.1
Same	4.5	18.2	21.4	0	10.5
Fluctuating	18.2	4.5	14.3	11.1	11.8

#### 4.1.6 Utilization of UA produces

Results in Table 6 indicate that major utilization of income from Urban Agriculture are home consumption (98.1%) and selling. Discussion with key informants during the Focused Group Discussion indicates that no value addition is done to the UA.

**Table 6: Utilization of produces from UA activities**

Utilization	Respondents				%
	Kilimani n = 31	Kikuyu N n = 30	Kikuyu S n = 32	Mkonze n = 30	
Home consumption	100	100	92.9	111.7	98.1
Selling	40	57.1	46.5	42.9	52.9

## 4.2 Characteristics of households involved in UA

### 4.2.1 Personal characteristics

Results on the personal characteristics of household involved in Urban Agriculture based on age, sex, household size, marital status, education level and place of birth are presented in Table 7 the results show the following.

#### 4.2.1.1 Age

Results on the age in Table 7 show that majority of household who are engaged in UA are young (43.4) and in middle aged group (43.4). These groups are energetic and at productive ages, ensuring availability of labor for UA if empowered. More involvement in UA for these age groups can also be due to the lack of alternative formal employment. This also signifies the importance of UA in providing employment to youth in urban areas. There are no youth (10-20) involved in UA. This is because the youth at this age are still in schools at different levels.

**Table 7: Personal characteristics (1)**

Variable	Description	Respondents ( %)				
		Kilimani N (n=31)	Kikuyu (n=30)	Kikuyu S (n=32)	Mkonze (n=30)	Total (N=123)
Age (years)	21-40(Young)	48.6	44.4	42.9	37.5	43.4
	41-60(Middle)	37.1	44.4	46.9	46.9	43,4
	>61(Aged)	14.3	11.1	7.1	9.4	10.7
Sex	Female	62.9	39.3	60.7	65.6	57.7
	Male	37.1	60.7	39.3	34.4	47.3
Household size (No)	2-5	40	60	46.4	50	48.8
	6-10	45.7	35.7	50	37.5	42.3
	1	5.7	3.6	3.6	9.4	45.7
	>11	8.6	0	0	0.8	3.3

#### 4.2.1.2 Sex

The results in Table 7 show that relatively large proportion (57.7%) of the household involved in Urban Agriculture were female. Female are more involved in Urban Agriculture than men because of their concern and responsibilities in ensuring household food security. Also previously, mostly African women were not given opportunities to attain formal education hence remaining with domestic

responsibilities and limited alternative economic activities. Kikuyu north had more men (60.7%) who are not employed hence engaging more in UA.

#### **4.2.1.3 The household size**

The results in Table 7 show that relatively large proportion (48.8%) of respondents involved in UA had 2-5 household members. Very few households (3.3%) with relatively large household size are involved in UA. The results need further investigation as we expected household with large size to be more involved in UA activity as they need more food and income and they are having more labor availability from household members.

#### **4.2.1.4 Marital status**

The results in Table 8 indicate that majority (80.5%) of respondents involved in Urban Agriculture were married. The reason for more involvement of married couple in Urban Agriculture is that marriage implies family responsibilities hence more demand for food and income. Urban Agriculture being alternative to generate income and provide food to household makes married persons to be more involved in Urban Agriculture.

#### **4.2.1.5 Education level**

Results on education level in Table 8 reveals that relatively large proportional (45%) of the people involved in Urban Agriculture have primary school education. This is the level of education with majority of Tanzania as it is compulsory therefore not surprising that a good number of respondents had that level of education. Lacking other alternative economic activities they choose to engage in Urban Agriculture. The results are similar to findings by Msami (2005) who observed that majority

(56%) of farmers who are engaged in poultry production in Sudan had no formal or with primary education.

**Table 8: Personal Characteristics (2)**

Variable	Description	Respondents (%)				
		Kilimani n = 31	Kikuyu N n = 30	Kikuyu S n = 32	Mkonze n = 30	Total N = 123
Marital status	Married	82.2	75	82.1	81.2	80.5
	Single	8.6	10.7	17.9	6.2	10.6
	Widowed	5.7	10.7	0	12.5	7.3
	Divorced	2.9	3.6	0	0	1.6
Education level	Primary	42.9	42.9	53.6	43.8	45.5
	Diploma/Degree	28.6	25	32.1	18.1	26
	Secondary	20	25	3.6	28.8	19
	Certificate	5.7	5.7	10.7	9.4	8.1
	Non formal	2.9	0	0	0	0.8
Place of birth	Outside current residence	65.7	82.1	75	81.2	75
	Current residence	34.3	17.9	25	18.8	24.4

#### **4.2.1.6 Place of birth**

The results in Table 8 show that about three quarters (75%) of urban farmers were not born within Dodoma Municipality. This is because of the rapid growth of Dodoma has attracted people from rural areas and from the regions. With lack of formal employment they find themselves engaging in UA.

### 4.2.3 Institutional Characteristics

#### 4.2.3.1 Rules and regulation governing UA.

Results in Table 9 revealed that rules and regulations that govern UA in the study includes restriction on growing long stem crops like maize, free range system and overstocking. However the regulation that were found to be more common to respondents are restriction on planting long stem crop (88.2%), restriction on overstocking (44.8%) and restriction on free range system (43%). The results indicates relatively high level of awareness (62%) due to various efforts by the government and city planning authorities to bring awareness on these regulations. However, according to majority (86% of respondents the level of adherence to these regulations was low.

**Table 9: Institution characteristics: Municipal regulation regarding UA**

Variable	Description	Respondents (%)				
		Kiliman n = 31	Kikuyu N n = 30	Kikuyu S n = 32	Mkonze n = 30	Total N = 123
Regulation awareness						
	Yes	64.7	67.9	64.3	51.6	62
	No	35.3	32.1	35.7	48.4	38
	Long stem	82.6	89.5	88.9	93.7	88.2
	Overstocking	21.7	63.2	33.4	86.7	44.8
	Free range	21.7	63.2	33.4	62.5	43.5
Level of adherence						
	Low	81.8	89.5	94.1	81.2	86.5
	Moderate	18.2	10.5	5.9	6.2	10.8
	High	0	0	0	12.5	2.7

The results in Table 10 indicate that most of respondents indicated reason for less adherence to include lack of other alternatives (36.8%) lack of education (3.2%), poor law enforcement as well as belief on land being individual property. The results indicate that respondents are not adhering to laws and regulation as they keep growing tall stem like maize which is regarded as staple food. Education can be provided so that they grow other crops that are accepted and use the income to buy maize.

**Table 10: Reasons for low adherence to regulation governing in UA.**

Reasons	Respondents ( %)				
	Kiliman n = 31	Kikuyu N n = 30	Kikuyu S n = 32	Mkonze n = 30	Total N = 123
No alternatives	43.1	53.6	33.1	63	36.8
Local belief on land	4.5	0	6.9	1.6	8.1
Law enforcement	2.9	7.2	0	3.1	3.2
Lack of education	2.9	3.6	7.2	0	3.2

#### **4.2.3.2 Extension services**

The results in Table 11 show that the majority (80.3%) of the respondents do not receive extension services related to the UA. This is because Urban Agriculture is given less priority by responsible authorities There is a need for the government to provide extension services to UA farmers over the potential contribution of UA. It is necessary for the government to support efforts by UA farmers in improving their livestock through UA. The results are similar to the findings by Drescher, (2000) who observed that low recognition of Urban Agriculture among planners and politicians.

**Table 11: Accessibility to extension services and training**

Category	Description	Respondents ( %)				
		Kiliman n = 31	Kikuyu N n = 30	Kikuyu S n = 32	Mkonze n = 32	Total N = 123
Extension	No	71.4	8	71.4	96.8	80.3
	Yes	28.6	17.9	28.6	3.2	19.7
Institution	NGO's	33.3	80	55.6	0	52
	Government	66.7	20	44.4	0	47
Training	No	88.6	85.2	75	93.8	86.1
	Yes	11.4	14.8	25	6.2	13.9

Training on Urban Agriculture is expected to improve the conduct in Urban Agriculture. However, results indicate that only few (13.9%) respondents had been trained in UA. Again this is due to less government support in Urban Agriculture. In business growth and development, training and skills are vital and necessary (URT, 2003) Training can't therefore be avoided for improving the conducts of UA.

### **4.3 Contribution of UA to livelihood of UA farmers**

#### **4.3.1 Employment opportunity**

Results in Table 12 indicate that UA is providing employment to almost all respondents. Also respondents are engaged in other income generating activities. The other activities are formal employment in civil services (35.2%), business (34.4%) and casual labors (30%). The results support earlier assumption of this study that UA is the main economic activity that can be helpful in creating employment opportunities. The results also support findings by Jacob, (2009) that Urban Agriculture results in an increase in entrepreneurial activities and the creation of jobs

as well as reducing food costs. Hence if given priority it can help to speed micro economy and hence benefit not only individual UA farmers but also the national.

Results also indicate that on average UA involves up to 15 members of household indicating significant contribution of UA to employment opportunities

**Table 12: Contribution of UA to employment**

Category	Description	Respondents (%)				
		Kilimani n = 31	Kikuyu N n = 30	Kikuyu S n = 32	Mkonze n = 32	Total N = 123
UA involvement	Yes	100	100	100	100	100
Activities	Employee	31.4	40.7	39.3	31.2	35.2
	Business	42.9	33.3	17.9	40.6	34.4
	Casual	25.7	25.9	42.9	28.1	30
Employed	1-5	60	80	75	72.7	71.4
	6-15	20	20	25	27.3	22.9
	>20	0	0	0	0	5.7

#### 4.3.2 Income generation

Results in Table 13 indicate the estimated annual income from UA activities. The type of UA activity that is highly contributing to income generation is livestock production. The income generated from urban farming is moderate in regard to respondents view. The results show that UA is highly contributing to income generation whereby every respondent receives more than low wage earner of 300,000 Tshs/ month. The income obtained excludes the produces consumed at home and not involving costs incurred in production. Income from crop cultivation is the least. This is due to the fact that crops are mostly used for food and farmers do not account the equivalent income. If the costs of production are included the actual

income benefit will be lower than the indicated figure. Therefore these figures should be considered as only indicative of the potential financial benefits from UA.

**Table 13: Income from Urban Agriculture**

Ward	Income (Tsh/ year)		
	Horticulture	Livestock	Crop
Kilimani	932,000	8,560,000	1,390,000
Kikuyu N	3,040,000	2,940,000	2,190,000
Kikuyu S	726,000	4,530,000	290,000
Mkonze	371000	33,200,000	1,580,000

#### 4.3.3 Food security

According to the results in Table 14 most of respondents (88.5%) of UA farmers are food secure. This reveals that Urban Agriculture contributes significantly to livelihood improvement. The priority to improve UA is required as it will be helpful to majority of urban dwellers who are depending on it.

**Table 14: Food security situation**

Category	Description	Respondents (%)				
		Kilimani n = 31	Kikuyu N n = 30	Kikuyu S n = 32	Mkonze n = 30	Total N = 123
Food secure	Yes	94	89.3	78.6	90.6	88.5
	NO	5.9	10.7	21.4	9.4	11.5
Source of food	Buying	91.5	89.3	74	90.7	86.9
	Own farm	15.2	75	59.2	81.3	73.8

The results in Table 14 show that majority of respondent (86.9 their food depend on buying food. This is accounting for food types that are not produced in their UA

farms. Also other respondents obtain their food from their own farms (73.8%). The results support earlier observations on the significant contribution of AU. The results are similar to the findings by Nelson, (1996) who observed that UA is an important part of sustainable development as it contribute to household food and income generation.

#### 4.3.4 Other by products

The results in Table 15 show that most of waste products are from plants residue (88.7%) as well as from cattle dung (59.4%). This indicates that UA can have a negative impacts if the wastes are not managed. Though wastes can in other way have a positive contribution when used as manure and animal feed and when sold for income generation. Therefore if the opportunity of these wastes available is utilized effectively by providing education on how to manage these wastes can be vital in helping the improvements of UA activities.

**Table 15: Wastes management**

Category	Description	Respondes				Total
		Kilimani n = 31	Kikuyu N n = 30	Kikuyu S n = 32	Mkonze n = 30	
Type of wastes	Cattle dung	94.3	82.1	70.9	84.3	88.7
	Plants residue	68.6	75	80	43.7	59.4
Use of wastes	Manure	68.6	82.1	70.4	3.1	73.0
	Livestock	20	10.7	29.6	21.9	23
	Selling	11.5	14.2	0	3.1	7.4
	Burning	2.9	0	0	3.1	4.1

Also it was revealed that the waste products from UA activities are mostly used as farm manure and as feed to livestock. Some UA farmers sell the wastes to the neighbor and few burns them. It was observed that some are burning indicates the need for training UA farmers on the best ways to manage wastes

## **CHAPTER FIVE**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Conclusion**

Major Urban Agriculture activity in the study sites are animal husbandry, crop cultivation and horticulture. Majority of urban farmers are female with primary education and migrated to towns from their places of birth.

Urban Agriculture contributes significantly to poverty reduction through income generation and food security. UA is not totally banned in the study areas but there are rules and regulations that govern it. However, adherence to the rules and regulations is very low. Despite the potential of UA it receives little attention in terms of extension services and training.

## **5.2 Recommendation**

- i. The government through ministry of Agriculture and Municipal authorities that are responsible for agricultural activities should organize training of Urban Agriculture so as to equip urban farmers with necessary skills to perform well UA.
- ii. Urban farmers have to join in groups for easy credits assistance to expand Urban Agriculture activities. Access to credits could give them more ability to produce through investing in modern agriculture, using advanced inputs and hence poverty reduction through income accrued from UA.
- iii. The government should consider incorporating UA in agricultural poverty reduction strategies so that it gets its due consideration.
- iv. The government through Local Government Authorities and town planners should include UA in their plans with options and guidelines on waste disposal.

## **5.3 Further Research studies**

The following areas need further research. Challenges facing women in dealing with Urban Agriculture, best option to ensure credits availability to Urban farming and reason for low adherence to regulations governing UA.

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## **APPENDICES**

### **Appendix 1: Questionnaire for Household Representatives**

**Contribution of Urban Agriculture on improving people's livelihood, in urban area.**

I am a student at the University of Dodoma doing research on the Contribution of Urban Agriculture on improving people's livelihood. You are among the persons who can assist in this research by providing information requested in the following questionnaire. The information will be used for academic purposes only and not otherwise. In addition all information given will be treated with great anonymity

and confidentiality; therefore you are kindly requested to answer the given questions as accurate as you can.

Date.....

## SECTION A

### Background Information

1. Questionnaires Number.....
2. Interviewee's name.....
3. Location.....
4. District.....
5. Street.....
6. Where do you live in Dodoma?
  - i. Kilimani ( )
  - ii. Kikuyu North ( )
  - iii. Kikuyu South ( )
  - iv. Mkonze ( )
  - v. Other place ( ), Specify .....
7. Where is your place of birth?
  - i. Place of current residence ( )
  - ii. Outside the place of current resident ( )
8. Sex..... a) Male( ), b) Female ( ),
9. Age.....(yrs)
10. Marital status... (1)Single ( ) (2) married ( ) (3) Widowed ( ) (4) Divorced ( )
11. What is your level of education
  - i. Primary school ( )

- ii. Secondary school ( )
- iii. Certificate ( )
- iv. Diploma/degree ( )
- v. Non formal ( )

12. What is your relationship with the head of the household?

- i. Head of household ( )
- ii. Wife ( )
- iii. Husband ( )
- iv. Mother ( )
- v. Child ( )

Other, Specify .....

13. What is the total number of members of your household including yourself

Total (.....) Female ( ) Male ( )

14. For how long have you stayed in Dodoma Municipality?..... (yrs)

15. What are your major economic activities ?

- i. Casual labor ( )
- ii. Business ( )
- iii. Civil servant ( )

Others Specify .....

## SECTION B

### Involvement in UA

16. Are you involved in any Agriculture related activities in urban area (UA)?

- i. Yes ( )
- ii. No ( )

If Yes for how long you have been engaged in UA  
 (years) .....

17. What type of Urban farming are you practicing?
- i. ....
  - ii. ....
  - iii. ....
  - iv. ....
  - v. ....
18. How many people have you employed or you normally hire to assist in UA farming?.....
19. Who are mostly involved in UA in your household?

Type of UA	Mostly involved
Horticulture	
Floriculture	
Animal Husbandry	
Apiculture	
Crop Cultivation	

20. Why are you involved in UA?
- i. Supplement income ( )
  - ii. Main economic activity ( )
  - iii. Food security ( )

iv. Others

Specify.....

21. How much did it cost to start the UA activities you are doing?

Type of UA activity	Investment costs Tsh/unit	Source of capital
---------------------	---------------------------	-------------------

22. How do you utilize products from UA?

i. Selling ( )

ii. Home consumption ( )

iii. Processing ( )

iv. Others ( ),

specify .....

23. What are the wastes products from your UA activities?

i. Cattle dung's

ii. Plants residues

iii. Animal's Food remains

iv. Others (specify) .....

24. Where do you dispose the waste products from your UA activities if any?

.....

What is the income from your UA activities

UA activity/products	Unit	Quantity	Rate
----------------------	------	----------	------

25. What are the main sources of food in your household?

a) Own UA farm ( ), (b) buying ( ) c) From relatives ( )

d) Others, Specify.....

26. Which type of food is mainly consumed in your household?

- i. Breakfast
  - a).....b).....c).....d).....
- ii. Lunch
  - a).....
  - b).....c).....d).....
- iii. Dinner
  - a) .....
  - b).....c).....d).....

27. Are you food secure throughout the year?

Yes (    ), No (    )

If no how many months are you food secure (    )

28. Do you pay any tax related to UA farming activities

i. Yes (    )

ii. No (    )

If yes , what type of Tax/ fees are you paying?

Fees/ tax/ license	Amount (Tsh)	Payee	Frequency
--------------------	--------------	-------	-----------

29. What is the trend of productivity in UA farms?

Type of UA	Trend of productivity	Reasons
------------	-----------------------	---------

30. Is environmental degradation a challenge in your UA activities?

Yes (    ), No (    )

If yes what type of environmental degradation are you experiencing?

i. ....

- ii. ....
- iii. ....
- iv. ....

31. What are the common diseases in your household?

- i. Malaria ( )
- ii. Typhoid ( )
- iii. Diarrhea ( )

Other,

Specify .....

32. Are you aware of any municipal regulation on UA?

Ye ( ) No ( )

If Yes what are these regulations

- i. ....
- ii. ....
- iii. ....

33. How do you rate the level of adherence to the UA regulation in your area

a) High ( ), b) Moderate ( ), c) Low ( )

34. What are the possible reasons for the above observation

- i. ....
- ii. ....
- iii. ....

35. Where do you sell your produce from UA?

- i. At home ( )

- ii. Market places ( )
- iii. Various institutions ( )
- iv. Others ( ), Specify.....

36. Who are the main buyers of your products from UA?

- i. Neighbors ( )
- ii. Business people ( )
- iii. Institution ( )
- iv. Others, Specify.....

37. What are the prices of the UA products from your farm

Type of UA	Products	Price for each (High, Moderate, Low)
------------	----------	--------------------------------------

Horticulture

Floriculture

Animal husbandry

Crop cultivation

38. Who sets the price of your products from UA?

- i. Buyer ( )
- ii. Middlemen ( )
- iii. Yourself ( )
- iv. Others, Specify .....

39. Do you receive any extension service related to UA?

- i. Yes ( )
- ii. No ( )

If yes

Specify.....

40. Which institution provide extension services

- i. Governmental institutions ( )
- ii. Non Governmental Organizations ( )
- iii. Others ( )

Specify.....

41. What type of assets do you own?

- i. House, Wall ( ), Roof ( ), Floor, ( ), Others
- ii. Transport assets, Car ( ) Motorcycle ( ) Bike( ) others ( )  
.....
- iii. Communication assets, TV ( ) Mobile phones ( ) Radio ( )  
Others .....
- iv. Energy sources, Fire wood ( ) Charcoal ( ) Electricity ( )  
Gas ( ) Solar ( ), Others ( )  
.....

42. Have you ever attended any training related to crop production or livestock keeping?

- i. Yes ( )
- ii. No ( )

43. How do you rate the contribution of UA to the improvement of the livelihood of your household?

Rank according to the extent to which UA contribute to the livelihood of the people.

Indicators

Contribution 1. High, 2.Modarate, 3.Low.

Food security

Income from UA

Assets

Paying for education of children

People's involvement in UA

Health services

44. What are your suggestions to improve Urban Agriculture?

i. ....

ii. ....

iii. ....

iv. ....

**Appendix 2: Questionnaire for Key Informants**

**Contribution of Urban Agriculture on improving people's livelihood, A case of  
Dodoma Urban.**

Place .....

Date.....

1. Name of respondent.....Department  
/Organization.....

2. Position of respondent.....Sex.....

3. Are you aware of any Urban farming activities in your area?

a) Yes    b) No    (    )

4. Which are the common types of Urban farming practiced in your area?

i. ....

ii. ....

iii. ....

iv. ....

5. What are the characteristics of the person involved in Urban Agriculture?

i. ....

ii. ....

iii. ....

iv. ....

v. ....

6. What are the factors for the people involvement in Urban Agriculture?

i. ....

ii. ....

iii. ....

iv. ....

7. What are the regulation governing Urban Agriculture in your area?

.....

.....  
.....

8. How do you rate the level of adherence to these regulations?

Very low ( ) Low ( ) Moderate ( ) High ( ) Very high ( ).

9. What are the main reasons that make other households not to get involved Urban Agriculture?

- i. ....
- ii. ....
- iii. ....

10. What are the main reasons for the above observation.

.....  
.....  
.....

11. How do you rate the contribution of Urban Agriculture in the livelihood of the people in your area

- 1. Income ( a ) high (b) moderate (c) low ( )
- 2. Food security (a) high (b) moderate (c) low ( )
- 3. Asset ownership (a) high (b) moderate (c) low ( )
- 4. Employment a) high b) moderate c) low ( )

12. What are the challenges of UA in your area?

- i. ....
- ii. ....

- iii. ....
- .
- iv. ....
- .

13. What need to be done in your area to promote Urban Agriculture

- i. ....
- ii. ....
- iii. ....

**Appendix 3: Questionnaire for customers**

**Contribution of Urban Agriculture on improving people’s livelihood, A case of Dodoma Urban.**

Date.....

Questionnaire ID .....

1. Personal details

Name .....

Sex

i. Male ( )

ii. Female ( )

2. What is your relationship with the head of the household?

i. Head of household ( )

ii. Wife ( )

iii. Husband ( )

iv. Mother ( )

v. Child ( )

3. What is your occupation?

.....  
.

4. What are the other major economic activities

i. ....

ii. ....

iii. ....

5. How frequent do you buy Urban Agriculture products

Type of UA products	Frequency	Price (High, Moderate, Low)
---------------------	-----------	-----------------------------

6. What do you do with Urban Agricultural products

i. Selling ( )

ii. Home consumption ( )

iii. Others, Specify .....

7. If selling to where do you sell your UA products

i. Consumers ( )

ii. Markets ( )

iii. Others,

Specify

.....

8. What do you do to add value?

i. Processing

ii. Packing

iii. Others, Specify .....

9. Who is setting the price of Urban products?

i. Buyer ( )

ii. Middlemen ( )

iii. Yourself ( )

iv. Others, Specify .....

10. Are you paying any tax as a result of engaging in Urban Agricultural products you buy?

i. Yes ( )

ii. No ( )

If yes, what type of Tax/ fees are you paying? How much and to whom?

Fees/ Tax /License	Price	Paying To Whom	Frequency
--------------------	-------	----------------	-----------

11. Are there any Law/ By laws which are governing your UA products?

Yes ( ) No ( )

If yes what are they?

- i. ....
- ii. ....
- iii. ....
- iv. ....

12. What are the benefits you are getting in engaging in UA products?

- i. ....
- ii. ....
- iii. ....

13. What are the challenges that you are facing as Urban Agricultural customer?

- i. ....  
.....
- ii. ....
- iii. ....

14. What do you think should be done to improve marketing of UA products?

- i. ....
- ii. ....
- iii. ....
- iv. ....

**Appendix 4: Guiding question for Focused Group Discussion**

**Contribution of Urban Agriculture on improving people’s livelihood, A case of Dodoma Urban.**

Date.....

Issues to be discussed

- 1. Identify and rank important Urban Agricultural activities in your area (UA)

.....

.....

.....

.....

.....

2. Identify and rank the benefits of UA.

.....

.....

.....

.....

.....

3. Identify and rank the challenges of UA activities

.....

.....

.....

4. What are the options to Improve contribution of Urban Agriculture to the livelihood of urban dwellers?

.....

.....

.....

.....

