Urban Agriculture: A Pathway for Enhancing Food Security and Poverty Resiliency in Tanzania

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ABSTRACT

This article provides both a theoretical and empirical evidence on the role of urban agriculture (UA) to food and nutrition security as well as poverty reduction in urban areas, which have persisted as policy challenges in Africa. While countries in the Sub-Saharan Africa have taken agricultural interventions at the centre of addressing food and nutrition security in rural areas, UA does not feature well in urban food and poverty reduction policies in Tanzania. This creates policy gaps between the global, regional and national policies towards attaining the Sustainable Development Goal-2 of Zero hunger by 2030 and the African Union Agenda 2063 on food and nutrition. This study derives from the nexus of theories of urban sprawls and urban food systems which consider urbanisation and the associated demographic changes posing unprecedented challenges in terms of hunger, food insecurity and malnutrition. Based on a cross-sectional research design, the study employed a mixed-methods approach, collecting data through questionnaires, interviews, and a systematic review of the literature. A sample of 600 respondents was selected using purposive sampling from a target population of 6,000, consisting of adult male and female farmers, agri-food supply chain producers, food processors, input suppliers, distributors, and traders in urban and peri-urban areas of Tanzania. The study examined and confirmed the contribution of urban agriculture on food availability, accessibility, stability and utilization in urban households. A systematic literature review shows a multitude of benefits of urban agriculture on food availability, accessibility, nutrient utilization and stability. The examined literature shows potential of UA to overcome youth unemployment as they engage into urban agricultural activities and therefore contribute to income and poverty reduction. Findings provides an understanding of inadequate policy enabling environment for UA as n frameworks for increasing food security. However, UA is being practiced without legitimate policy and legal frameworks. The study recommends for institutionalization of UA as a pathway for attaining food and nutrition security and poverty reduction and therefore, calls for policy agenda setting to create space for UA in city policies and planning.

Key words: Urban Agriculture, Food Security, Poverty, Resiliency, Policy

I. INTRODUCTION

Agriculture is conventionally a rural based economic activity. However, with the global food crisis and the surging urban population have become the drivers of urban agriculture (UA) to tackle food insecurity. Increasing food demand for the growing urban population contributes to accelerating growth in demand for poultry products, meats and milk products, let alone vegetables and cereals (maize, rice, sorghum). Urban agriculture is defined as a farming system with varying characteristics depending on local socio-economic, geographic and political conditions (Mensah, 2023). The most common definition of UA is defined as an industry located within urban and peri-urban of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and food-products found in and around that urban area (Stewart et al., 2014). Other scholars encompass community gardens, home gardens, individual gardens, commercial farms, institutional gardens, controlled environment farms, and urban parks under UA definition (Falcon et al., 2022)

According to Food and Agriculture Organization (FAO), urban agricultural is also known as the growing or production of plants and the raising of animals within and around cities in urban and peri-urban areas (FAO, 2021; Gómez-Villarino et al., 2021; Steenkamp et al., 2021; Othman et al., 2017). For example, UA is practiced in restricted environmental areas or hazardous areas resulting in land degradation and water pollution (Mlozi et al., 2014). The International Resource Panel (IRP) describes the importance of UA is attached to its connection to Sustainable Development Goals (SDGs) including eradicating poverty, ending hunger, achieving gender equality, contributing to well- being, and promoting sustainable cities (IRP, 2021). Urban agriculture is also important for circular economy and climate change mitigations (Manríquez-Altamirano et al., 2020; Steenkamp et al., 2021; Weidner et al., 2019). Nevertheless, UA face institutional, technological and policy related challenges which become the focus of this study.

Tanzania has been implementing agriculture for poverty reduction strategy through various socio-economic policies and reforms including the National Poverty Eradication Strategy of 1998 (Magombeyi & Odhiambo, 2016)

and thereafter the 2nd Five Year Development Plan (FYDP-II) 2016/17-2020/21 and FYPD-III 2021/22-2025/26 (United Republic of Tanzania [URT], 2021). The HBS 2017/18 survey shows 26.4 percent of the population (about 14 million people) of Tanzania lived below the basic need poverty line. Although food extreme poverty is more pronounced in rural areas (9.7%) than in urban areas, the National Bureau of Statistics (NBS) indicate urban poverty was (4.4%) (NBS, 2020), whereas it is reported by the World Food Programme (WFP) the global trend shows that the burden of food insecurity is shifting from rural to urban due to the increasing urban population (WFP, 2023). One of the challenges for overcoming poverty is the rapid urbanization is the increasing urban population (Gómez-Villarino et al., 2021) following the rural-urban migration which reduces the rural capacity to produce food on the other hand increases food demand in urban areas.

Tanzania National agriculture policy recognizes the role of UA for food security and poverty reduction (URT, 2013) of the urban population. In order to harness the urban migrated labour, cities and towns dwellers, the national policy provides provisions for practicing urban and peri-urban agriculture (UPA). However, there is policy incoherence with Local Government Authorities (LGA) by-laws which prohibits UA for insufficient data and evidence on the role of on UA role to food security and poverty reduction. The urban agriculture is increasingly becoming an important discussion in the academic research as well as national and internation policy development discourse due to its potential on poverty reduction (Badami & Ramankutty, 2015). Urban agriculture systems include production systems, processing, distribution and marketing and consumption of food. It is observed that global population is projected to reach 9.7 billion by 2050 out of whom 70 per cent of will be living in urban areas (IRP, 2021). It is also observed that about 90 per cent of the projected urban growth population will occur in Africa (Steenkamp et al., 2021). On the other hand, it is estimated that 80 per cent of food will be consumed in urban areas by 2050 (FAO, 2021; WFP, 2023). This means, feeding the urban population will require transformations in the food production systems including bringing food production closer to urban areas (IRP, 2021) such as promoting UPA to contribute to employment creation, food and nutrition security (IRP, 2021).

In the last 2022 population census in Tanzania shows a total population of 61,741,120 people, with urban population of 21,539,695 (35%) (NBS, 2022). This is a rapid urban population growth from 23.1 in 2002 to 34.9 percent in 2022 (NBS, 2022). Studies express gaps between urban population growth and food security; that the rapid urban population growth doesn't meet food needs in urban areas due to urbanization (Liu et al., 2021). Urbanization in developing countries has become a cause of food insecurity due to the associated major drivers such as rapid urban population growth (Gebremichael et al., 2022). Table 1 shows the growing trend of urban population in many African countries.

Table 1

Urban Population Trend in Selected Countries, 1990-2030

Country	1990	2000	2010	2020	2030
Tanzania	4818366	7548327	11495088	17324322	25354692
Zambia	3200068	3636948	4507125	5910077	7987890
South Africa	19020040	25831462	30404526	34153146	37957268
Mozambique	2857784	5585558	8691840	12412567	16709829

Source: Crush et al. (2012)

Nevertheless, the policy incoherence between urban population, agriculture and food security to complement food requirements. Improving urban agrifood systems contributes to urban households income and food security and thus improving livelihoods in urban households (Sgroi & Musso, 2022). In order to overcome risk of extreme poverty for the increasing population and rapid urbanization, agricultural production will need to expand by 60% by 2050 to meet increased demand, and most of this will need to come from increased productivity (Steenkamp et al., 2021). However, there are multiple agrifood system challenges limiting UA to contribute to poverty reduction. Although Tanzania attained its food sufficiency level, urban food insecurity remain a challenge to many poor households that can't access food (Smith & Fabe, 2024).

Agrifood system is still characterized by low productivity and high food losses. About 40% of the food produced is lost along the supply chain during distribution, marketing, storage, and post-harvesting. Post-harvest (PH) losses pose a serious threat to food security in Tanzania. This challenge is critical to attaining food security (URT, 2019). According to (Mhache & Lyamuya, 2019; Mlozi et al., 2014) UPA in Dar es Salaam city is practiced in open-space vegetable production, tomatoes, okra and eggplants, cassava, rice, maize and cowpeas, bananas, pineapples, coconuts and oranges grown for income generation as well as household nutrition purposes. Livestock and poultry keeping form an important component of urban farming. Dairy cattle are kept within housing compounds and grazed in open spaces, along roads, play grounds, beaches, and streams that help to alleviate poverty. To address these challenges, evidence is required to

inform policy decisions to make informed decisions. Studies such as (Davies et al., 2021; Moragues-Faus & Battersby, 2021) have indicated policy gaps on addressing challenges of urbanization, food security and agrifood systems.

1.1 Statement of the Problem

The global population projection is estimated to reach 9.8 billion people by the year 2050 (Falcon et al., 2022) with an expected 68% of them residing in urban areas (Steenkamp et al., 2021). The rapid urban population growth is mainly experienced in developing countries and in Africa in particular where agriculture is a key economic sector underpinning their economies in terms of food security and major source of employment (Christiaensen & Maertens, 2022). However, more than 20% of the population is on average food-insecure due to rapid urbanization (Crush et al., 2012), thus urban food insecurity and poverty for urban households remain a critical policy challenge in Tanzania. The United Nations Department of Economic and Social Affairs (UNDESA) projects that urban population growth in Sub-Saharan Africa to reach 1.2 billion by 2050 (UNDESA, 2024) which will increase food stress. According to the United Nations Human Settlement programme (UN-Habitat) Africa's urban population projection by 2030 is expected to reach 50 percent of the continent's total population, with a significant increase in urban dwellers due to rapid urbanization (2024), while the urban population of Tanzania is projected to grow reaching about 53 percent of the total population by 2050 (WB). On the other hand, about 900,000 people (13 percent of a population of 7.1 million people in 21 analysed district councils of Mainland Tanzania are experiencing high levels of acute food insecurity (IPC, 2024).

1.2 Research Objectives

i. To examine the contribution of urban agriculture on urban food security in urban Tanzania
ii. To assess the enabling environment that support urban agriculture on urban food security in urban Tanzania

II. LITERATURE REVIEW

2.1 Theoretical Review

This study used a theory that urbanisation and associated demographic changes pose unprecedented challenges in terms of hunger, food insecurity, malnutrition and poverty and UA as pathway for reducing the urban challenges; that inclusive links within food systems and agricultural value chains is crucial for sustainable urbanisation in developing countries (Hatab et al., 2019). It is also influenced by the smart city theory develops a conceptual link between smart city planning and urban food systems for overcoming food insecurity, where urban food comprises diverse food production practices and is increasingly framed by food security discourses (Maye, 2019) and pathways for building resilient sustainable cities (Pearson et al., 2014).

Whereas food security is defined as ‘a situation where all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life’ (Chihambakwe et al., 2018), UA is theoretically conceptualized to overcome urban food insecurity as it contributes to food availability, accessibility, nutrient utilization and food stability (Figure 1) to urban households. Scholars have argued that UA plays critical role in addressing the consumptive needs of households and supplementing household income or reducing on food expenditure (Chihambakwe et al., 2018). It is further argued that the most noted benefit of UPA is that it offers households a supply of fresh and nourishing produce and contributes to one fifth to two thirds of the total household food supply.

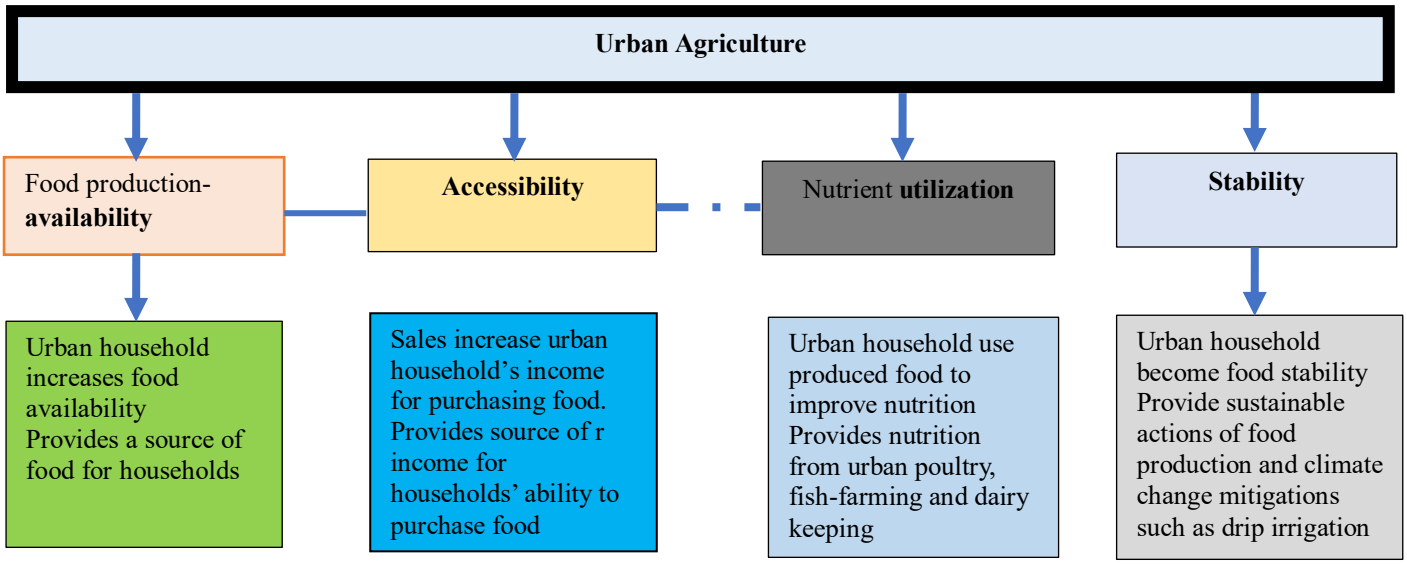

Figure 1
Conceptual Framework of Urban Agriculture Contribution to Food Security

Korth et al. (2014) systematic review shows that the City of Johannesburg in its Growth and Development Strategy identifies UA as its main intervention to address food security within the city. In another note, the UN High Level Task Force on the Global Food Crisis identified UA as an important strategy to alleviate urban food insecurity and to build cities that are more resilient to crises. Also, FAO/World Bank paper also expressed that "the World Bank and FAO will promote UA related programs and projects to eradicate extreme poverty and hunger (Korth et al., 2014). Urban agriculture is therefore defined as an industry located within (intraurban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products (Korth et al., 2014). As a social-economic intervention, geographically located in urban and/or peri-urban areas, involves any form of agriculture with the aim of improving the food security including horticulture, animal husbandry, aquaculture and forestry that generate fruits and vegetables, dairy products, meat, and fish, inter-alia.

2.1.1 Urban Agriculture-Urban Sprawls and Urban Food Systems

This study derives from the nexus of theories of "urban sprawls and urban food systems" whereby urbanisation and associated demographic changes pose unprecedented challenges in terms of hunger, food insecurity and malnutrition (Hatab, et al., 2019). This research applied mixed methodology of survey, interviews and systematic literature review which revealed that UA assures food security by increasing food availability, access, utilization and stability to poor urban households. The urban policies and planning are crucial to enhancing food security and sustainable cities because urban populations around the world are growing creating demand for meeting food needs. Ackerman, et al (2014) argue that one of the solutions to inadequate food access in cities is UA. They further argue that UA is beneficial in developing cities because it touches on the three pillars of sustainability; economic, society, and environment (Ackerman, et al., 2014).

Theory of UA states that UA has impact on urban food produced that impact on community food security (Siegner et al., 2018). They examine the role of city planning, food policy, and community engagement in creating spaces for UA in cities. They conclude and recommend to policymakers and practitioners to create spaces in cities for food security, justice, equity, access, and sovereignty.

2.2 Empirical Review

Measurements of food insecurity in urban areas is assessed on households' ability on food availability, accessibility, utilization and stability. The objective of the study is to examine the effect of UA on food security in urban Tanzania. This can be summarized in (Filippini et al., 2019) who contend that UA policies are oriented towards both subsistence and commercial production to enhance food accessibility, availability, nutritional values and stability for urban households. Scholars (Mkwambisi et al., 2011; Poulsen et al., 2015; Siegner et al., 2018) provide empirical evidence that including UA or urban farming enhances food security in urban areas therefore agriculture policies are necessary to support sustainable urban development (Filippini et al., 2019).

They argue that urban food policies should be "inclusive of food issues in a comprehensive city plan ensures adequate housing, jobs, transportation, and food security." Urban and peri-urban agriculture can play a very significant

role in providing food for cities and can contribute to urban food security (Siegner et al., 2018); UA is used both as a tool and pathway for entrepreneurial city and as a grassroots response to food insecurity.

An empirical literature shows the contribution of UA to food security is evidenced in a systematic review of urban food access and food security in peer reviewed scholarly works. The empirical evidence comes from (Nogeire-McRae et al., 2018) whose empirical evidence shows UA economic impact to local economies when it (a) creates jobs; (b) strengthens local economic linkages which improves households access to food. Titz and Chiotha (2019) argue that to a varying degree, the livelihoods of peri-urban population and urban dwellers depend on natural resources. For instance, informal sector activities such as UA are used both as source of basic food and generation of household income to supplement sources from peri urban and rural areas (Stewart et al., 2013). Also, Maxwell et al. (1998) study of urban farming in Kampala Uganda provides one of the empirical evidence where a bivariate comparison of mean Z-scores for children in farming and nonfarming households. When controlling for socioeconomic status, the nutritional status of children in farming households is significantly higher than children in nonfarming households as indicated by mean Z-scores for height-for-age. The study showed a nutritional effect in height-for-age growth farming households.

Urban food insecurity and poverty become the critical policy problems in many African countries. While urban population is expected to rise from 39.7 in 2005 to 53.5 per cent by 2030 agriculture ought to keep on playing role for food security and poverty reduction by embracing UA as a pathway for overcoming food insecurity and unemployment. According to the Food and Agriculture Organization (FAO, 2002), food security exists when "all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". The urban population engaged in UA contribute to attaining food security pillars. Urban agriculture plays role for attaining food security by contributing to food availability, accessibility, stability and utilization (Poulsen et al., 2015). It is empirically shown the UA benefit to food security as evidenced in empirical literature that between 100–200 million urban farmers worldwide provide city markets with fresh horticultural goods on daily basis (Mkwambis et al., 2011) and that UA contributes to social improvement since the poor households spend up to 85 percent of their income in food purchase. Therefore, UA presents an opportunity for improving food supply, health conditions, local economy, social integration, and environmental sustainability

2.2.1 Urban Agri-Food Systems Transformation

A food system approach also allows for a more holistic understanding that food security is not just about calorific intake but that the food utilization (quality of food) as reflected in nutrient content, food safety, and quality is a very important dimension of food security (Bannor et al., 2021). In essence, a food system captures all the elements and activities that relate to the food supply chain and the outputs of these activities, including the socio-economic and environmental outcomes (Tate et al., 2024). Urban food systems transformation is expected to shift the focus from primarily focusing on boosting production to nourishing people in a more inclusive, equitable and sustainable approach, to ensure that future generations will be better provided for and achieve sustainability (Ayambire et al., 2019; Gómez-Villarino et al., 2021; Tate et al., 2024). As food system transformation is expected to reflect the approach of pursuing social, environmental, nutritional, and health outcomes and potential influences, ensuring global food security to achieve the Sustainable Development Goals (SDGs) will depend on the potential of food systems to increase the efficiency, resilience of UA to sustainably produce for poverty reduction (Langemeyer et al., 2021; Tate et al., 2024). Urban agriculture should also be take into consideration of not only its potential for food security but also its contribution to circular economy in urban areas as it is used in Brazil (Machado & Cunha, 2022).

Food insecurity in urban areas is mainly threatened by increasing food prices and rural-urban migration (Nickanor et al., 2016). The World Food Programme (WFP), underscored the causes of urban food shortages in Tanzania are attributed to food losses and waste estimated between 30 -40 percent for cereals and 100 percent of perishable crops (WFP, 2021) happening particularly in urban markets. Therefore, as part of the accelerated structural transformation process, agri-food systems (AFSs) have become increasingly important in terms of their contributions to GDP poverty alleviation, reducing unemployment, enhancing food and nutrition security, and livelihoods. Urban agriculture as transformational shift prompted by urbanization and food demand and dietary needs. Jaganath (2021) study found varied forms of UA playing an important role in urban food systems as it creates food production, processing and distribution systems as well as providing local employment opportunities.

2.2.2 Urban and Peri-Urban Agriculture Dynamics

Peri-urban areas are localities situated on the fringes of urban centres, and they are known to play a crucial function in the agri-food value chains with agriculture and livestock keeping being the dominant activities (Ayambire et al., 2019; Gómez-Villarino et al., 2021; Tate et al., 2024). Urban Agriculture is the production of crops and livestock within cities and towns, and it also includes activities such as processing and distribution of agricultural produce, not just the production thereof. Because of proximity to the city market, urban and peri-urban households integrate

themselves into agri-food-related value chains with activities such as farming, processing, transporting, and trading. For example, peri-urban households as well as their urban counterparts do engage in farming of food crops (such as vegetables and fruits) that have readily available markets. Essentially, despite challenges of UPA, literature shows that it continues to expand due to increasing and changing food demand to cope with rapid urbanisation (Ayambire et al., 2019). Urban and peri-urban households utilize both formal trading channels (such as registered food markets) and informal channels (such as kiosks and street vending) to undertake these activities while rural food producers must transport their produce to local and urban markets.

Urban and peri-urban agriculture systems are increasingly facing challenges due to the expansion of the built environment. Their contribution to poverty alleviation, unemployment, and food security cannot be overemphasized hence the need to improve the food supply chain. There is a need therefore to integrate small-scale farmers to be part of the mainstream food supply chain. Climate change-induced hazards due to extreme weather events is also an imminent threat to UPA. These have resulted in acute water shortages and energy crisis prompting these farmers to turn to use of climate-smart agriculture technologies such as hydroponics, aquaponics, vermicomposting, use of short, seasoned crop varieties, use of greenhouses and other technologies (Magwaza et al., 2020).

Urban and peri-urban agriculture is often utilized by urban residents as a response to urban dynamics of hunger and malnutrition; harnessing the advantages of urban circularity environments for agricultural production; or urban greening and the emerging hydroponic technology (Magwaza et al., 2020). Other than UPA role on food security, it has cultural and beautification importance as city gardens are used for relaxation, weddings and associated cultural values (Ilieva, et al., 2022).Thus it is important to assess the local contexts and capacity for adoption of resilient approaches in UA for poverty reduction (Yan et al., 2022). However, UA is practiced in planned and unplanned settlement areas. City planning should consider that urban food production and processing is done in the designated planned areas. It is argued that with the growing urban population, there is a need for undertaking creative measures to strengthen food production and distribution systems in cities as major consumers. Institutional support, technical capacities, grant schemes and other investments towards urban agricultural productivity are key enabling environment for UA aspects to play on poverty reduction (Caka, 2022).

III METHODOLOGY

3.1 Study Area

This research was conducted in Tanzania urban and peri-urban areas in Dar es Salaam, Pwani and Morogoro regions between February and March, 2024. The choice of these regions was guided by the rapid urbanization and population growth situations in these regions.

3.2 Study Design

The study adopted cross-sectional design which is characterized by the collection of relevant data at a given point in time (Wang & Cheng, 2020). Data were gathered using a survey method due to its suitability for assessing participants' attitudes and providing preliminary evidence focusing on individuals' experience. A questionnaire was administered for collecting quantitative.

3.3 Target Population

The target population was 6000 comprising of adult male and female urban farmers, agri-food supply chains food producers, food processors, input suppliers, distributors, and traders.

3.4 Sample Size

This study used purposeful and convenience sampling for selecting wards and households engaged in urban farming. A purposeful sampling was used because this technique enables collecting data from participants with deep information on the studied phenomena. A convenience sampling technique was used to select urban farming wards and households that are not too far apart. This sampling technique is suggested and commonly used to minimize researchers traveling costs (Mohsin, 2016). The study used a sample size of 600 comprised of urban farmers engaged in vegetable farming, poultry keeping, gardens, small holder rice farmers in urban and peri urban areas.

3.5 Data Collection

A mixed research method approach was used that included qualitative and quantitative techniques to collect data and assess contribution UA to food security in Tanzania urban and peri-urban. Whereas, a bibliometric analysis was conducted to assess scientific publications that informs policy decisions for adoption of UA for food security and poverty reduction pathways. This was complemented with systematic review which requires a developed protocol that include objective, aims, research questions, inclusion and exclusion criteria of the study (Bandara & Syed, 2023). The objective

of this paper is to review the contribution of UA to food security and reduction of poverty. PICO (Table 2) inclusion criteria (Frandsen et al., 2020) was used to include published articles in peer reviewed journals in English language between 2000 and 2023 on UA, farming, agrifood systems in Africa in the databases of The review extracted data from peer reviewed academic literature generated from google scholar, Agricola and Scopus.

Table 2
PICO Inclusion Criteria for Systematic Review Protocol

Inclusion criteria	**Details of criteria**
Participants	Geographical location of studies- are in Africa, men, women, youth
Intervention	UA, farming, agrifood systems, food security and poverty Impact evaluations
Comparison	Assessment on UA, food systems crop vs livestock systems Rural vs UA
Outcome	Evidence of UA on food security and poverty

Adopted from: Frandsen et al. (2020)

A Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) (Moher et al., 2015) and its Extension for Scoping Reviews (PRISMA-ScR) (Tricco et al., 2018) was considered relevant to answer a general research questions; does UA improve food security?; Does UA reduce poverty?. The objective was to find evidence to inform policy decision making on setting new policy agenda for UA or making some reforms on the existing legislations and policies. A predetermined search strategy used the Boolean Operators "AND" "OR" to sort out the existing literature reporting on UA in Africa. The general search strategy is framed as: "Agriculture" OR "farming" OR "Agrifood" AND "Urban" OR "Cities" AND "Food" AND "Security" OR "Poverty" AND "Africa".

IV. FINDINGS & DISCUSSION

4.1 Response Rate

The study sample was 600 with a survey completion rate of 564 (94%) comprising of 405 male (71.8%) and 159 female (28.2%). The majority (72.8%) of the interviewed urban farmers owning land. However, land ownership exclusion was noted with only 19.8 percent female owning land (Figure 2).

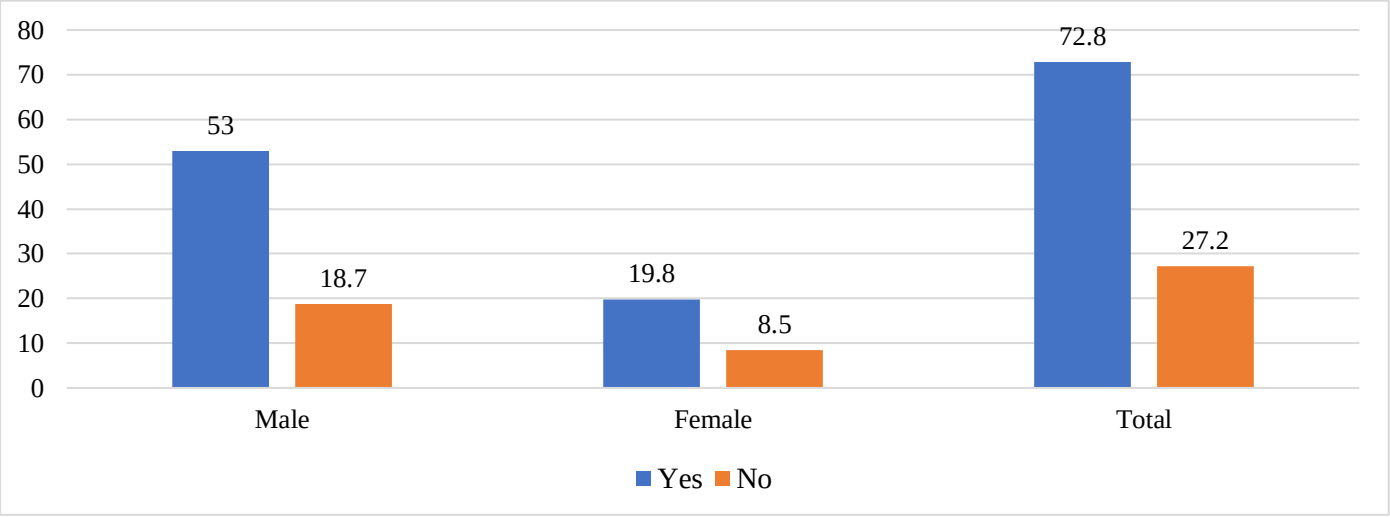

Figure 1
Gender based Ownership to Urban Land

Urban households' access to land shows the majority (73%) of respondents have access to land for urban farming. However, the land size varies with the majority having less at lease 1ha but less than 5 ha (Fig 3).

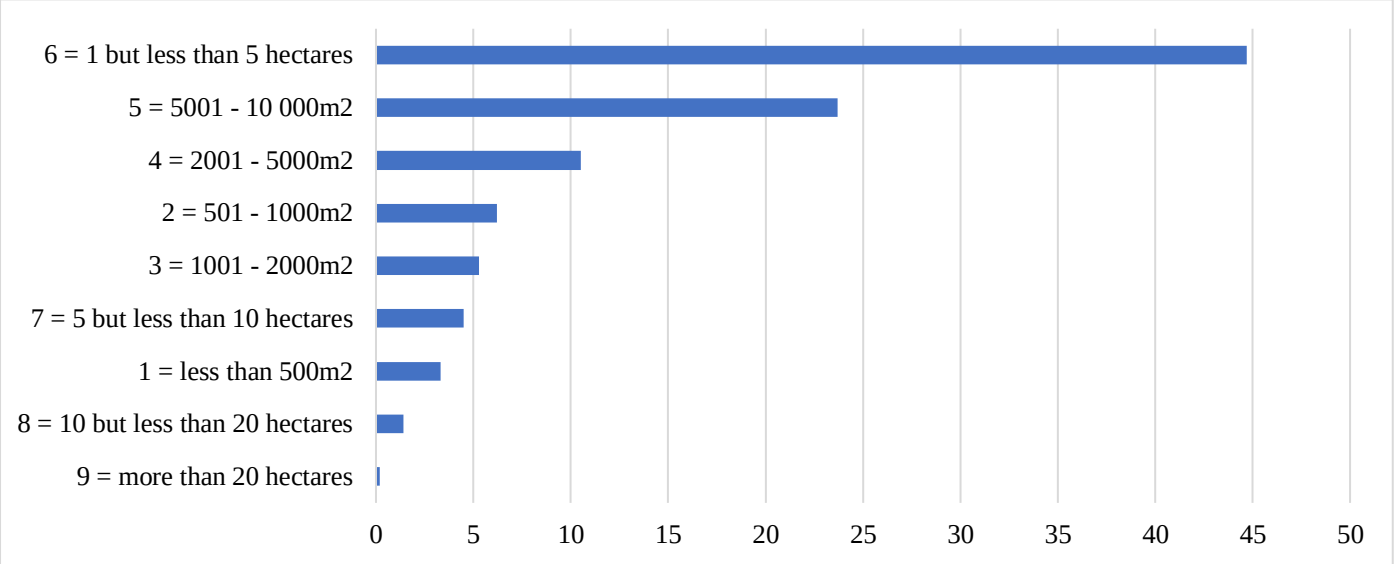

Figure 2
Households Land Size Ownership

4.1.1 Contribution of UA on Urban Food Security in Urban Tanzania

A systematic literature review indicate that UA contributes to food security and employment creation (Mkwabisi et al., 2010; Zezza & Tasciotti, 2010) as it becomes a source for fresh vegetables and other crops with valuable micro-nutrients. Similar study in Ghana found that UPA plays an important role in meeting food and nutrition needs of those living in the increasingly urbanized cities, where, (43%) of urban residents are involved in the production of food either in the urban or rural areas or both, primarily for household consumption and sale of surplus produce (Ayerakwa, 2017). On the other hand, (Audate et al., 2018) reported findings and outcomes related to UA on health and wellbeing of the urban population as it diversifies to nutritional foods including vegetable, poultry and dairy products, also (Warren et al., 2015) conducted a systematic review and found a strong association between UA and nutritional effects on urban households.

4.1.2 Enabling Environment That Support Urban Agriculture on Urban Food Security in Urban Tanzania

Enabling environment is known as the necessary and supportive conditions (Diaz-Bonilla et al., 2014) for UA to have maximum potential contribution. In response to the question on enabling environment promotes UA contribution for food security, about 94.9 percent of respondents do not receive government support on the adoption of CSA (Figure 4), implying that UA is not given prominence in the agriculture policy space. This is contrary to equitable Government subsidy programme which offers input subsidy to rural farmers.

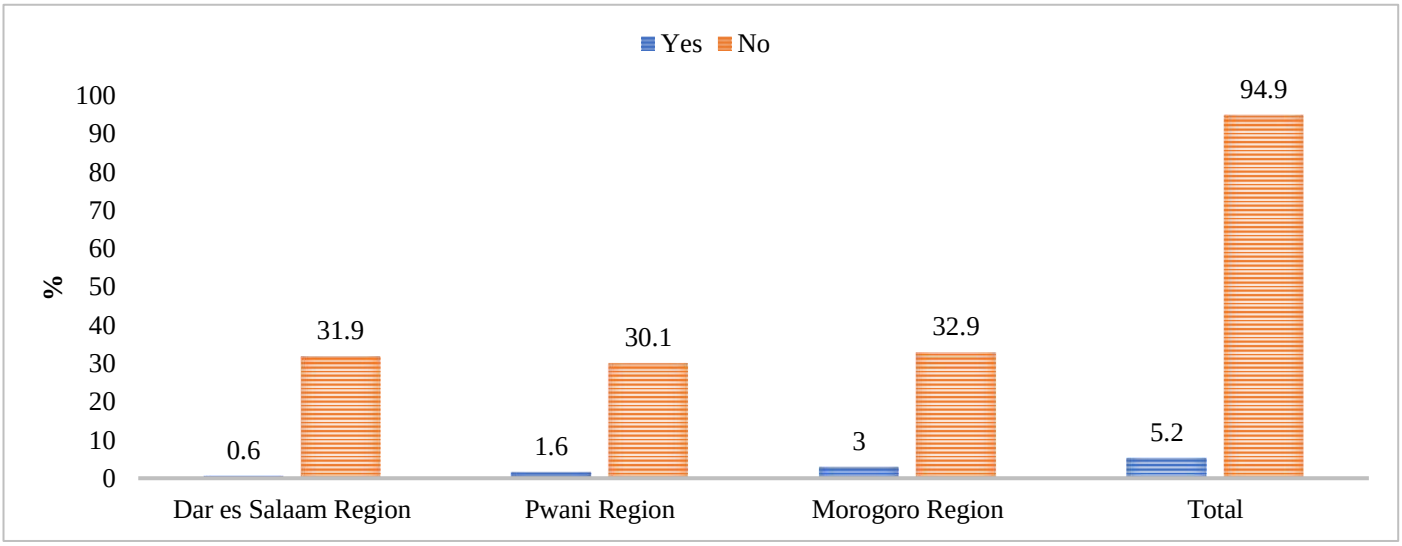

Figure 4
Government Support to Urban Agriculture

Empirical evidence from scientific and scholarly work on UA indicate the increasing interest both in the academic and public policy space on the importance of UA. Figure 5 shows a growing trend of publications from 2002 with the highest peak in 2022. Certainly the global and regional policies towards Sustainable Development Goals (SDG) push concerted efforts for the urban dwellers also to contribute to SDG 2 of Zero hunger and that UA can only be sustained if city authorities consciously integrate agriculture (Deelstra & Girardet, 2000).

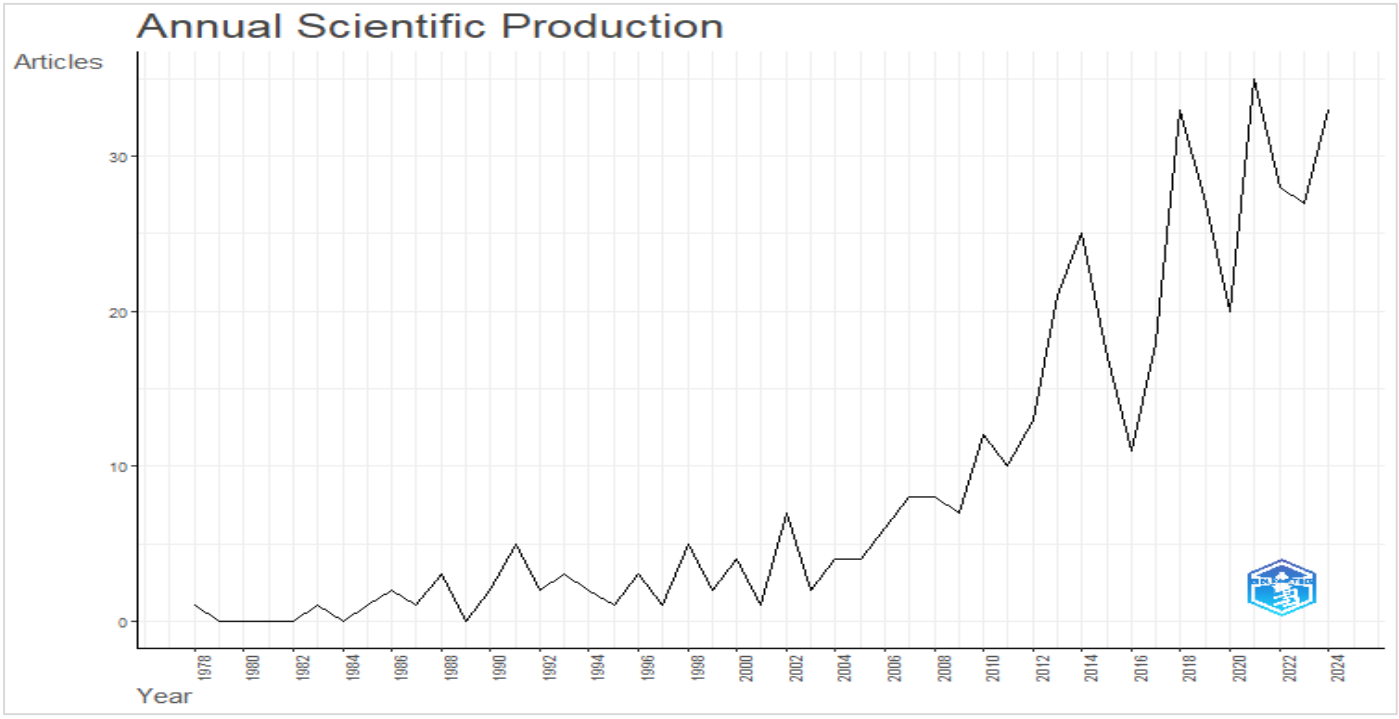

Figure 5
Scientific Production on Urban Agriculture

Urban agriculture as an upcoming approach for increasing food security, poverty reduction and employment creation is increasing in scientific publications from 2000. The food crisis of 2000 might have contributed to encouraging urban farming in many countries in the world. The developed European countries have taken the lead on scientific publications on UA that certainly has informed policy decisions to promote urban farming as shown in Figure 6.

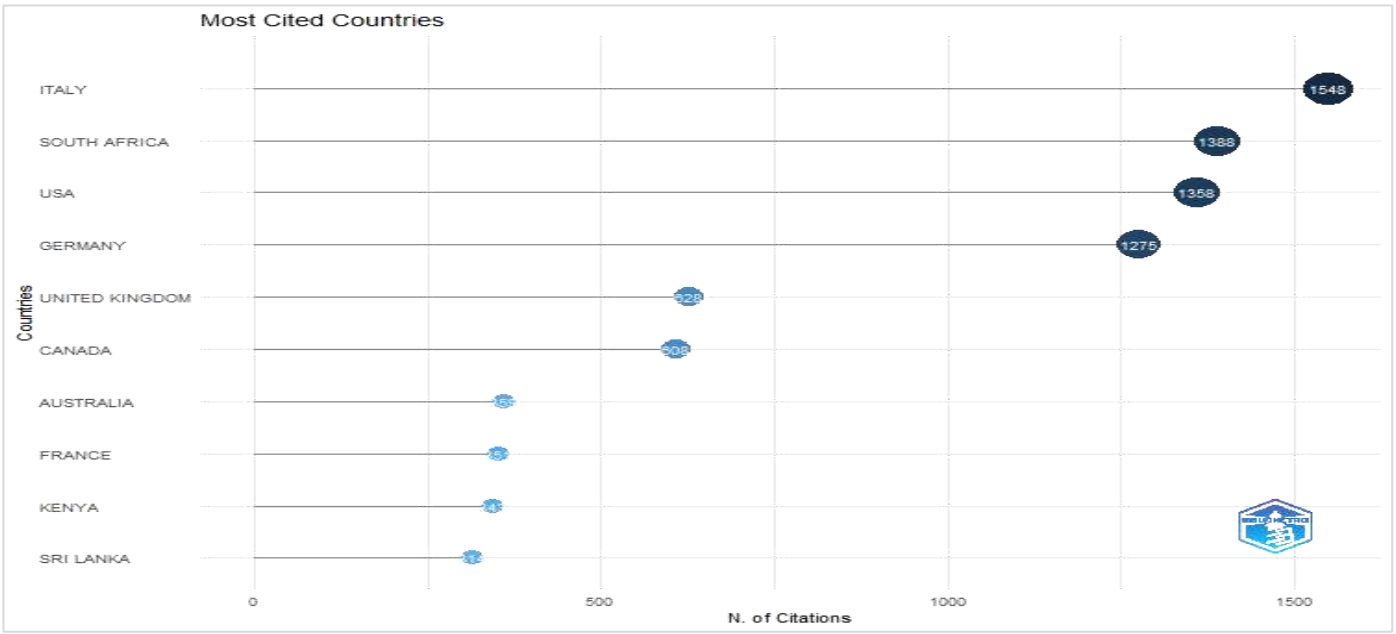

Figure 6
Most Cited Countries with Urban Agriculture

The empirical evidence from scientific publications depicts the role of UA in a wide range of food supply, employment to urban population, environmental protection (Figure 7) that have influenced urban food policies (Baker & de Zeeuw, 2015), which have become necessary to address urban food security and urban poverty particularly in Africa, which has high rates of urban population growth and high levels of urban food insecurity (Smit, 2016).

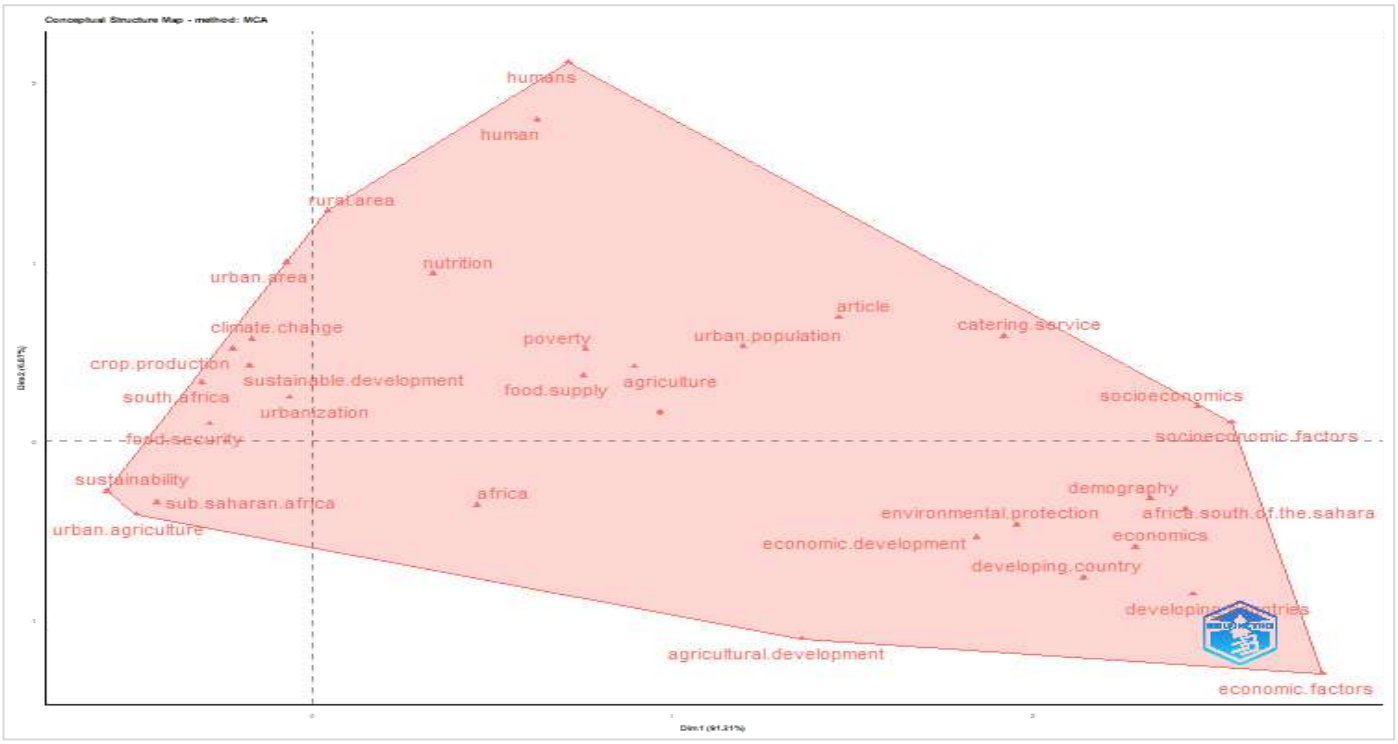

Figure 7
Conceptual Structural Map on Contribution of Urban Agriculture

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusions

The study observed that contribution of UA to food security is evidenced in the literature covering global and African region. Further, UA contributes to social improvement of the poor urban households who spend up to 85 percent of their income in food purchase. UA represents one of the pathways for improving food supply, health conditions, local economy, social integration, and creating resilient sustainable cities to food shocks.

Urban agriculture and food security and have far reaching implications to policy makers, urban planning and for low and middle-income people in urban areas. Both theoretical and empirical literature provides evidence that UA plays role to attaining the four pillars of food and nutrition security in urban areas. Given the potential impact and benefits of UA, the study concludes that it must be given a considerable space in the agriculture policy and legal framework of city planning and by-laws. Given the current policy on sustainable cities, the sustainability of cities should consider providing enabling environment for UA as it contributes to households' food security and poverty reduction.

5.2 Recommendations

There should be concerted efforts from the government and all stakeholders to institutionalize UA as a pathway for attaining food and nutrition security and poverty reduction

The government inputs subsidy programme is an important enabling policy environment that should be scaled up to urban households engaged in urban farming or agricultural enterprises with the spirit of No-One Left Behind on attaining Sustainable Development Goal-2 of Zero hunger. The established gardens in urban areas should be protected by City-by-laws as they contribute to youth unemployment who engage into urban agricultural activities and therefore contribute to poverty reduction. We recommend to policymakers to create space for UA in land use city planning.

5.3 Policy Implications

The policy implication of this study is to set a policy agenda and reforms to accommodate UA as legitimate interventions for attaining Sustainable Development Goal-2 of Zero hunger both in rural and urban areas. It also implies city and urban planning to include urban farming for the urban dwellers to engage into agricultural income-generating

activities. This study sheds light on policy implications that local government authorities' obligation to providing enabling environment to support UA as it contributes to food availability, access, utilization and stability to poor urban households.

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