



Typologies, spatial distribution, and gender dynamics of urban agriculture in Dodoma city, Tanzania

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ABSTRACT

This paper examines the typologies, geographic spread, and gender dynamics of urban agriculture (UA) in Dodoma City, Tanzania, to identify how urban agriculture operates in a context of accelerated urbanization. Led by the Sustainable Livelihoods Framework, the study examines how urban households mobilize resources and put coping strategies in place to deal with socio-economic and environmental limitations, including access to land, gender dynamics, policy restrictions, and on-farm modifications. A cross-sectional survey design involving multistage sampling targeted 15 mitaa¹ (neighborhoods) in eight wards. The sample included 300 urban farmers from squatter and non-squatter settlements. Structured questionnaires, focus group discussions, key informant interviews, and field observations were utilized to gather data. Quantitative data were analyzed with descriptive and inferential statistics, while qualitative data were analyzed thematically. Evidence suggests that the most prevalent types of UA are crop-only farming, mixed farming, and livestock-only farming, with crop-only farming being the most widespread. The more dominant homestead farming is, the more casually UA takes place in floodplains and on government lands, contrary to government land-use policy. UA is a crucial livelihood strategy, food security, income diversification, and employment, particularly for poor households. Gender relations show men dominating decision-making, but a trend towards joint and female-headed UA among women in female-headed households. Such changes reflect increasing empowerment with adjustment to new household organization and economic pressures. Differences between squatter and non-squatter areas are explained by differences in tenure security, enforcement of rules, and access to infrastructure. Against the background of continued urban expansion in Dodoma and rising reliance on UA, the study recommends the advancement of space-saving agriculture innovations and investment in education and extension services. Further studies should address the environmental impact and scalability of urban agriculture to inform inclusive and sustainable urban food system policy in Tanzania.

Keywords: Dodoma City, Gender Dynamics, Spatial Distribution, Typologies, Tanzania, Urban Agriculture

I. INTRODUCTION

Urban agriculture (UA) refers to the production, processing, and distribution of food and other agricultural items in and near urban centers. It involves practices like the cultivation of crops, livestock keeping, aquaculture, and horticulture conducted in urban landscapes like home gardens, rooftops, open spaces, and institutional grounds (Food and Agriculture Organization [FAO], 2020). Urban agriculture is increasingly an important component of urban food systems, with implications for food security, employment, income generation, and environmental management (de Zeeuw *et al.*, 2011). UA can be categorized by typology, spatial distribution, and gender roles. Typology refers to the kind of agricultural activity chosen (crop-only, livestock-only, or mixed systems), based on land availability, local diet, market demand, and household labor. High-value, short-cycle crops such as vegetables, fruits, and poultry products are prioritized in the urban areas due to their fast turnover and demand in the market (Drechsel & Dongus, 2010; Zezza & Tasciotti, 2010; Mwajombe, 2011; Namwata, 2013).

Spatially, UA is executed on a broad spectrum of urban areas that vary from residential backyards and roadside parks, peri-urban peripheries, institutional complexes such as schools and hospitals, and slum settlements. These diverse locations signify the opportunistic and adaptive nature of UA within cities with minimal or no formal space allocation for farming. Most of them are outside formally planned land use, which creates uncertain tenure conditions, weak regulation management, and frequent conflicts with local governments (Simon *et al.*, 2004; Orsini *et al.*, 2013). Not only does spatial informality limit farmers to secure land, but it also exposes them to dangers such as eviction,

¹*Mtaa* (*Mitaa* plural) is Swahili for the lowest administrative unit in urban areas under the Local Government Authority system in Tanzania.

environmental destruction, and infrastructure lack. However, despite these issues, UA continues to serve as a livelihood and food security strategy, particularly for poor urban dwellers (Drechsel & Dongus, 2010; Zezza & Tasciotti, 2010). It is crucial to understand the UA's spatial heterogeneity to formulate city policies that integrate agricultural land uses into formal planning practices while addressing public health and sustainability. Scholars advocate for more equitable zoning policies that delineate secure, low-risk areas of production and facilitate regulated access to public land for the public (Hovorka, 2006; Namwata *et al.*, 2015). In addition, UA offers urban planners the potential to increase the resilience of cities with green infrastructure, increase localization in food systems, and correct social equity by legitimizing and enabling informal food producers (Mkwambisi *et al.*, 2011). Such a policymaking would be spatially conscious to embrace and blend to propel UA to the center of planning for sustainable city development from the fringes of urban politics, especially in rapidly urbanizing areas like sub-Saharan Africa.

Gender is at the heart of urban agriculture. Women often constitute the highest percentage of urban farmers, and they are involved in production, processing, and marketing, especially in informal settlements. Their work maintains household food security and serves as a source of economic empowerment (FAO, 2011; Hovorka, 2006). Despite this, gendered inequalities in access to land, financial services, and decision-making authority persist (Namwata *et al.*, 2015; Kutiwa *et al.*, 2010). For Tanzania, the national census indicates that women constitute 51% of the total population and are highly engaged in informal employment sectors, including UA (Mwajombe, 2011; Namwata, 2013; United Republic of Tanzania [URT], 2013). Although several studies have examined UA in Tanzania, none have comprehensively examined the intersection of typologies, spatial patterns, and gender relations. This paper seeks to fill this knowledge gap with an exploration of how these dimensions interact in Dodoma City with a view to informing policy and improving the sustainability and inclusivity of urban agriculture.

1.1 Research Objectives

The primary objective of this study is to assess the typologies, spatial distribution, and gender dynamics of urban agriculture (UA) in Dodoma City, Tanzania. The study is guided by a set of specific objectives that provide a basis for investigating how UA is shaped by social, spatial, and institutional processes within the context of Dodoma's rapidly urbanizing environment.

- (i) To examine the socio-economic and demographic profiles of urban farmers in Dodoma City, Tanzania
- (ii) To evaluate the typologies and shifting patterns of UA activities in Dodoma City, Tanzania
- (iii) To examine the spatial patterns of UA practices across different types of settlements in Dodoma City, Tanzania
- (iv) To inquire into the gender relations that influence decision-making in urban agriculture in Dodoma City, Tanzania

II. LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Sustainable Livelihoods Framework (SLF)

This study is informed by the Sustainable Livelihoods Framework (SLF) that was developed by the UK Department for International Development (DFID, 1999). The SLF offers a comprehensive framework for understanding how households use five key capital assets, natural, human, physical, social, and financial, to sustain and improve their livelihoods in circumstances marked by vulnerability and limited institutional support (Scoones, 1998; Ellis, 2000). In Dodoma urban agriculture, the SLF allows for the analysis of how farmers employ land (natural capital), labor and expertise (human capital), tools and infrastructure (physical capital), networks and associations (social capital), and savings or micro-credit (financial capital) to cope with economic stress and urban land scarcity. The SLF also allows for the investigation of enabling or constraining roles of institutions and policies, such as land tenure systems, municipal bylaws, and planning systems that directly affect access to assets and livelihood outcomes. Importantly, the SLF also considers gendered dimensions of asset control and decision-making. In urban agriculture households, women have restricted access to finance and land but are central to household resilience and food security. The SLF, hence, provides an extremely solid foundation for interpreting adaptive strategies, gender equity, and institutional dynamics affecting urban agriculture.

2.2 Empirical Review

2.2.1 Typologies of Urban Agriculture

African urban agriculture practices vary widely and are influenced by socio-economic factors, land availability, and proximity to markets. Some of the common UA typologies include crop-only systems, livestock-only systems, and composite systems that have both (Zezza & Tasciotti, 2010; Orsini *et al.*, 2013). In Dar es Salaam and Morogoro, research reveals that residents of the cities engage in UA primarily for subsistence but also semi-commercially, with vegetables, poultry, dairy, and fruits (Mwajombe, 2011; Namwata, 2013; Namwata *et al.*, 2015). Mixed farming is

commonly practiced in peri-urban zones, where land is more readily available, whereas crop-only systems prevail in inner cities due to limited space (Lwasa *et al.*, 2014). These typologies often reflect informal household responses to meet dietary and income needs in the context of limited formal employment opportunities.

2.2.2 Spatial Distribution of Urban Agriculture

The spatial manifestation of UA is often outside formal planning structures. It is commonly practiced on household plots, open spaces, road verges, institutional land, and peri-urban areas (Dubbeling *et al.*, 2010; Lee-Smith, 2010). In most cases, these sites are informally occupied, raising concerns over land rights, environmental sustainability, and municipal enforcement. In Dodoma, Mwajombe (2011), Namwata (2013), and Namwata *et al.* (2015) found UA practiced in both formal and informal settlements, often on non-titled land and public spaces. This reveals a disconnect between urban planning and the livelihood strategies of the people and justifies integrating UA into spatial planning systems.

2.2.3 Gender Dynamics in Urban Agriculture

Women are leading the urban agriculture (UA), particularly the household production and supply of food. FAO (2011) stated that women account for a maximum of 65% of all urban farmers worldwide. Despite their significant roles, women usually have limited access to essential resources such as land, agricultural inputs, extension services, and institutional markets (Hovorka, 2006; Mwajombe, 2011; Namwata, 2013). In East Africa, studies have found women to be mostly engaging in laboring activities such as planting and harvesting, while men control more lucrative aspects of UA, including selling produce and making financial choices. However, as UA increasingly becomes a prevailing survival strategy within fast-growing urban environments, there is a tremendous shift. Growing numbers of women are taking on leadership roles in UA and expanding decision-making power, particularly where economic conditions have transformed traditional gender roles. In Tanzania, Namwata (2013) and Namwata *et al.* (2015) established that UA not only improves nutrition within the household but also produces a substantial income for women, particularly in female-headed households.

While urban agriculture (UA) has gained increasing academic and policy attention in sub-Saharan Africa due to its food security, poverty alleviation, and urban sustainability contributions (Zezza & Tasciotti, 2010; Orsini *et al.*, 2013), there is a pressing research imperative to comprehend UA typologies, spatial scope, and gender dynamics in rapidly expanding secondary cities like Dodoma, Tanzania. Literature hitherto generalizes UA practices, whereby most has focused on urban agglomerations such as Dar es Salaam, Nairobi, or Accra (Drechsel & Dongus, 2010; Hovorka, 2006), neglecting relatively fast-growing inland capitals such as Dodoma, which have unique governance, land tenure, and infrastructure issues due to their being in the transitional urban stage. Moreover, typological diversity, ranging from crop monoculture to mixed systems, is weakly documented regarding spatial constraint and regulation of land-use policy. Spatially, most UA activities in Tanzania occur informally in out-of-land-use areas such as floodplains, road reserves, and peri-urban edges (Simon *et al.*, 2004; Namwata, 2013), yet little research explores how such spatial distributions vary across squatter and non-squatter settlements or overlap with formal planning systems. Also, while UA is presented as a sort of women's activity, no empirical work is found that interrogates how gendered roles and decision-making authority are reconfiguring in the face of urban pressures, economic need, and changing household dynamics (Hovorka, 2006; Namwata *et al.*, 2015). The absence of local, integrated information on these aspects in Dodoma limits the capacity of policymakers and urban planners to develop inclusive land-use policies, promote gender-equitable access to resources, and scale up sustainable UA practices. This study bridges this gap by offering a close, spatially contextualized, and gender-sensitive analysis of UA in Dodoma City and casts further light on how urban agriculture evolves in changing urban landscapes.

III. METHODOLOGY

This study was conducted in Dodoma City Council, Tanzania, which was purposively selected because it is the national capital city, with a rapidly growing population, and where the rising contribution of UA to the livelihoods and food systems of its inhabitants is increasing (FAO, 2022; Namwata *et al.*, 2015; Namwata, 2013). With Dodoma continuing to undergo large-scale urban transformation, UA has increasingly become part of the socio-economic survival strategy of its people. The city is demarcated into 22 administrative wards, eight wards—Ipagala, Hazina, Mnadani, Kiwanja cha Ndege, Miyuji, Kilimani, Kikuyu North, and Chamwino—of which were selected owing to the saturation of visible UA activities. In these wards, 15 *mitaa* (neighborhoods) were purposively selected for active participation in UA practices, including Swaswa, Mlezi, Hazina, Mbwanga, Mnadani, Mathias, Karume, Kilimani, Chinyoya, Kigamboni, Mazengo Sekondari, Mlimwa, Osterbay, Mailimbili, and Mazengo.

A cross-sectional study design was used to capture conditions and practices at one point in time. The design has been widely used in UA studies in the examination of the spatial, socio-economic, and gendered aspects of urban farming

(Simon et al., 2004). The study population was urban farmers engaged in vegetable and fruit cultivation, poultry keeping (broilers and layers), and small-scale dairy keeping, which operated within formal and informal settlements. To determine the appropriate sample size, the research employed the formula developed by Poate and Daplyn in 1993.

$$n = \frac{Z^2 C^2}{X^2}$$

Where n is the required sample size, Z is the standard normal at 95% confidence level (1.96), C is the estimated variability in the population (assumed at 50% as there was no previous data), and X is the provided margin of error (5%). Employing the formula, a proposed sample size of 384 respondents was arrived at. For practical and time factors, however, a last sample of 300 respondents was achieved, which was still statistically adequate for descriptive and inferential analyses (Namwata *et al.*, 2015; Namwata, 2013).

Non-probability sampling techniques, snowball sampling, and convenience sampling, were employed to select respondents. These techniques were appropriate given the non-formal and dispersed nature of urban farmers across Dodoma. Primary respondents were picked using ward leaders, agricultural extension officers, and word of mouth from communities to ensure that the selection represented the diversity of UA practices and locations.

Primary data were collected using mixed methods in which quantitative and qualitative methods were combined. Systematic questionnaires were conducted to gather data regarding demographic profiles, UA practices, land access, input usage, and decision-making of women in farms. Additionally, 12 Key Informant Interviews (KIIs) with ward officers, mitaa leaders, land and agriculture officials, and DUWASA staff were conducted to obtain informed opinions on policy, land use, and water management concerns related to UA. Besides, eight Focus Group Discussions (FGDs) were carried out among the selected wards with adult members of the community to talk about shared experiences and beliefs related to UA. Field observation was undertaken to validate self-reported practices of UA, and policy and planning documents relevant to the matter were reviewed to provide institutional context.

Qualitative data obtained from KIIs and FGDs were processed using thematic content analysis, using the Braun and Clarke method. The answers were transcribed, translated appropriately, coded, and grouped into thematic themes matching the study objectives, e.g., UA typologies, spatial arrangement, and gender roles. This allowed for a thorough understanding of the socio-political and cultural forces underlying UA in the city. Quantitative data were summarized using descriptive statistics (frequencies and percentages) for profiling respondents and for identifying the dominant UA patterns. Chi-square (χ^2) tests were also applied to examine significant relationships between variables such as UA activity types, gender, and settlement type. This combination of qualitative and quantitative methods created a robust, detailed image of the socio-economic, gendered, and spatial dimensions of urban agriculture in Dodoma City.

IV. FINDINGS & DISCUSSION

4.1 Characteristics of Respondents

Demographic profiles of participants in urban agriculture (UA) in Dodoma present mixed trends in nativity, gender, education, marital status, and employment, each with its contribution toward developing explanations for why and how individuals engage in UA. These findings are consistent with earlier research on UA populations in Tanzania (Mwajombe, 2011; Namwata, 2013) and contribute to mounting knowledge about how urbanization and socio-economic forces influence agricultural production in urban spaces.

On nativity and settlement type, as shown in Table 1, 69.3% of the participants were Dodoma natives. Statistically significant settlement-level differences were found ($p < 0.05$), as 79% of UA participants residing in squatter settlements were natives, versus 63% for non-squatter settlements. This suggests that squatter settlements are more likely to be occupied by long-term dwellers who have had historical or familial ties to the area, while non-squatter settlements have attracted newer immigrants, perhaps due to urban expansion and formal employment opportunities. These findings agree with Namwata (2013), who suggested that Tanzanian urban agriculture is strongly linked with historical local settlement habits and that locally born inhabitants are more likely to engage in UA due to traditional land use patterns and social tolerance. A participant from an FGD in Mnadani ward stated:

"I was born here in Dodoma and never left. It's the newcomers in the planned areas who are still adjusting. We have always relied on land and farming."

This sentiment illustrates the embeddedness of UA among indigenous urban residents, contrasting with migrants who often enter UA out of economic desperation rather than cultural continuity, a dynamic echoed in other African cities experiencing rapid urban growth.

Table 1*Characteristics of the Respondents (n=300)*

Characteristics of the Respondents	Area of Residence				All (n = 300)	Chi-square Value
	Squatter (n = 119)		Non-Squatter (n=181)			
	N	%	N	%	N (%)	
Ethnic Background						0.003
Natives	94	79.0	114	63.0	208 (69.3)	
Migrants	25	21	67	37.0	92 (30.7)	
Sex						0.517
Male	82	68.9	131	72.4	213 (71.0)	
Female	37	31.1	50	27.6	87 (29.0)	
Education Level						0.331
No formal education	18	15.1	28	15.5	46 (15.3)	
Adult education	5	4.2	8	4.4	13 (4.3)	
Primary school education level	70	58.8	91	50.3	161 (53.7)	
Secondary school education level	21	17.6	41	22.7	62 (20.7)	
Tertiary education level	5	4.2	13	7.1	18 (6.0)	
Age						0.649
20-30 years	25	21.0	26	14.4	51 (17.0)	
31-40 years	36	30.3	54	29.6	90 (30.0)	
41-50 years	23	19.3	44	24.3	67 (22.3)	
51-60 years	24	20.2	40	22.1	64 (21.3)	
61+ years	11	9.2	17	9.4	28 (9.3)	
Marital Status						0.201
Single	18	15.1	30	16.6	48 (16.0)	
Married	89	74.8	117	64.6	206 (68.7)	
Widowed	7	5.9	17	9.4	24 (8.0)	
Separated/divorced	5	4.2	17	9.4	22 (7.3)	
Sources of Income Apart from UA						0.000
Government employment	6	5.0	34	18.8	40 (13.3)	
Private or self-employment	96	80.7	136	75.1	232 (77.3)	
Remittances	17	14.3	11	6.1	28 (9.3)	

Note: Percentage figures in parentheses indicate the overall percentage for each variable. Results are significant at 5% level.

On gender distribution, the survey data in Table 1 reveal 71% of UA respondents were male, and no statistically significant difference existed in squatter versus non-squatter ($p > 0.05$). Qualitative evidence, however, reveals a gendered division of labor and control under the literature on unobserved female labor in UA (Namwata, 2013; Mwajombe, 2011). In Mnadani ward, a female respondent stated:

"Men can own the land, but it's women who work in the fields every day. We take most of the decisions because we are the ones working in the fields on a day-to-day basis."

One woman pointed out, "UA is treated as men's only when there is money. Otherwise, it's we women who sow and irrigate." These results reflect what Orsini *et al.* (2013) refer to as de facto female leadership in UA, in which labor-intensive tasks are often controlled by women even if men are assigned as the de jure decision-makers or landowners. The study also validates Mougeot's (2006) note that gender roles in UA are increasingly evolving, especially among low-income households in which women's work and involvement are central to food production and decision-making.

Educational level among respondents was generally low: 53.7% had a primary education, 20.7% had a secondary education, and 15.3% were not schooled (Table 1). This agrees with previous findings by Scoones (1998), where he indicated that individuals with lower educational attainment are likely to have limited access to formal employment and therefore turn to UA as an acceptable survival strategy. In FGDs carried out in Hazina ward, one of the male participants said:

"Once I completed Standard 7, I was not able to attend school anymore, so I began working on the farm with my parents. Most of us here have such backgrounds—UA closes the gaps education could not."

Another respondent chimed in: *"Those who hold degrees might seek work in offices, but for us with limited education, UA is a means to support ourselves."*

These narratives support the argument that limited educational opportunities force young people and adults into UA, where skill barriers are low but incentives, especially in the form of food security, are tangible. On marital status and age, no significant differences were found in terms of age or marital status between the settlement types ($p > 0.05$),

a pattern to which Namwata (2013) concurred, reporting UA transcends demographic groups, being a significant livelihood activity for both the young and old, married and single. But FGDs showed how UA household roles are affected by marital status. A married Kikuyu North man explained:

"Farming is a family business in our home. My wife plants and I handle the animals—we agreed long ago that that's the way we want it to be."

On the other hand, a widowed Chang'ombe ward woman said,

"Since my husband passed away, I do the garden by myself. UA makes me able to feed my children without depending on others."

These assertions are consistent with more general patterns in the literature that marital status affects farm labor allocation, input access, and decision-making independence. Widowed or single-headed households, usually female-headed, are significantly reliant on UA for income and food security.

On employment status, the findings in Table 1 confirm that 77.3% of the respondents were self-employed or informally employed, and the higher proportion of formally employed individuals was found within non-squatter settlements. This confirms UA as a bifunctional role, both a sole source of income for the unemployed or underemployed and a secondary or complementary source of income for the formally employed. This was reiterated in studies by Mwajombe (2011) in Dar es Salaam and Namwata (2013) in Dodoma, who characterize UA as an adaptive livelihood strategy that addresses a broad array of economic needs. As one of the key informants working for an NGO put it:

"I have been sustaining layers along with work for a decade—urban agriculture compensates for low wages."

This encapsulates what Scoones (2008) calls "livelihood hybridization," whereby even those with waged work rely on UA to buffer them against the effects of low or unreliable incomes, rising urban cost of living, and limited access to food.

4.2 Typologies, Trends, Determinants, Experience, Space, and Gender in Urban Agriculture

4.2.1 Typologies of Urban Agriculture (UA) Activities

As summarized in Table 2, crop farming is the greatest category of UA activity (51%), followed by livestock-only systems (20.3%), integrated crop-livestock systems (15.7%), and horticultural production (13%), including vegetables and fruits. These trends represent an expression of the adaptive flexibility of UA in an urban environment constrained by land, income, and regulation.

Table 2

Typologies of UA Activities (n=300)

Typologies of UA Activities	Area of Residence				All (n = 300)	Chi-square Value
	Squatter (n = 119)		Non-Squatter (n=181)			
	N	%	N	%	N (%)	
Livestock keeping only	12	10.1	49	27.1	61 (20.3)	23.13
Crop cultivation only	73	61.3	80	44.2	153 (51.0)	
Both livestock and crop cultivation	25	21.0	22	12.2	47 (15.7)	
Both vegetables and fruits production	9	7.6	30	16.6	39 (13.0)	

Note: Percentage figures in parentheses indicate the overall percentage for each variable. Results are significant at 5% level.

A noteworthy difference appears in the geographical structuring of these activities: livestock-alone activities were significantly more common in non-squatter settlements (27.1%) than in squatter settlements (10.1%), a statistically significant difference ($p < 0.05$). This suggests that non-squatter settlements would have more land, facilities, and capital available, and thus are in a better position to host relatively capital- and land-demanding livestock production. Squatter residents, by contrast, would favor crop cultivation or small-scale horticulture, which demand fewer dollars and space. This aligns with Namwata (2013), Namwata *et al.* (2015), and FAO (2020), who describe urban agriculture across East Africa as diversified but shaped by intensified spatial patterns, where homes farm in snug residential areas and are faced with environmental, legal, and financial limits. Most of the livestock were under zero-grazing conditions—a common city practice, where land is limited and control is tightened. In Swaswa, one of the FGD members explained the utilitarian character of such practices:

"Most of us cultivate vegetables such as mchicha or keep chickens—not for love of farming, but for the sake of managing to make a living in town where jobs and food are scarce."

The above quotation confirms Namwata (2013), evidence that UA in African cities is not about passion or entrepreneurial spirit but rather a compensatory survival response by urban residents facing systemic poverty and economic marginalization. The occurrence of integrated systems (15.7%) also indicates an increase in resilience-based

strategies, where homes incorporate different UA types to diversify against risks such as price variation, disease outbreaks among livestock, or droughts in crops.

4.2.2 Evolving Patterns in Urban Agriculture Activities

While most of the participants exhibited enduring UA activities, 16.7% exhibited temporal changes (Table 3), driven mainly by land constraint, economic constraints, policy intervention, and market volatility. That statistically significant differences between squatter and non-squatter zones were not observed ($p > 0.05$) means that systemic pressures reach urban farmers all over the city regardless of socioeconomic or legal standing. These shifting trends reflect broader structural shifts described in Namwata (2013), Namwata *et al.* (2015), where urban agriculture evolves in reaction to municipal limitations and urban employment insecurity, forcing practitioners to downsize or adjust.

Table 3

Evolving Patterns in Urban Agriculture Activities (n=300)

Evolving Patterns in UA Activities	Area of Residence				All (n = 300)	Chi-square Value
	Squatter (n = 119)		Non-Squatter (n=181)			
	N	%	N	%	N (%)	
Changes in Types of UA Activities						
Yes	16	13.4	34	18.8	50 (16.7)	1.57
No	85	71.4	119	65.7	204 (68.0)	
Never thought	18	15.1	28	15.5	46 (15.3)	
Previously Practiced Types of UA						18.49
Livestock keeping or crop cultivation	11	9.2	26	14.4	37 (12.3)	14.63
Both livestock and crop cultivation	7	5.9	5	2.8	12 (4.0)	
Vegetables or fruits production	-	-	13	7.2	13 (4.3)	
Factors Driving Changes in UA Activities						14.63
Lack of enough capital	8	6.7	5	2.8	11 (3.7)	
Unreliable markets	-	-	10	5.5	10 (3.3)	
Inadequate land	5	4.2	5	2.8	10 (3.3)	
Bv-laws restrictions	5	4.2	9	5.0	14 (4.7)	

Note: Percentage figures in parentheses indicate the overall percentage for each variable. Results are significant at 5% level.

As one of the participants from Chang'ombe found out:

"I used to have pigs, but the municipal laws constrained me too much. Nowadays, I just plant vegetables in bags indoors; it is the only way by which I survive."

This transition from stock to sack farming is typical of a broader trend in urban Africa, where policy discourages intensive systems and leads to smaller, more manageable operations. These are less visible, more acceptable, but less economically rewarding. One of the principal informants in the agriculture department said,

"Farmers transition away from animals to crops, not individually, but due to city policy and high prices. The system doesn't function much in support of small farmers."

This institutional predisposition is what Namwata (2013) and Namwata *et al.* (2015) observed in the pan-African urban setting: municipal arrangements tend to overlook or actively suppress informal urban agriculture, conforming rather than enabling innovation or expansion. The implications are significant: UA is not organically evolving by farmer preference but conforming to structural and rule demands. It has limited innovation, increased exposure, and disproportionately affected poorer farmers in both settlement types.

4.2.3 Factors Influencing Engagement in Urban Agriculture

The findings outlined in Table 4 underscore UA's utilitarian logic: 47% of the sample reported household food security as the most important reason to be involved in UA. It was trailed by income diversification (31.7%), utilization of vacant land (11.3%), and lack of other job opportunities (10.3%). These motives are reinforced by greater studies by Namwata (2013) and Namwata *et al.* (2015) that indicate UA is an economic insurance measure for residents of towns suffering from high unemployment levels, informal labor practices, and rising food prices. Urban agriculture, thus, is simultaneously a subsistence activity and economic buffer.

Table 4*Factors Influencing Engagement in Urban Agriculture (n=300)*

Factors Influencing Engagement in UA	Area of Residence				All (n = 300)	Chi-square Value
	Squatter (n = 119)		Non-Squatter (n=181)			
	N	%	N	%	N (%)	
Household food security	61	51.3	80	44.2	141 (47.0)	11.87
Income diversification	40	33.6	55	30.4	95 (31.7)	
Hobby and use of the extra land available	5	4.2	29	16	34 (11.3)	
Had no other job	14	11.8	17	9.4	31 (10.3)	

Note: Percentage figures in parentheses indicate the overall percentage for each variable. Results are significant at 5% level.

An elderly woman in Kilimani ward pointed out the necessity: "We do our backyards because we have to feed our kids even when times are expensive."

In the same way, a man respondent in Mnadani ward clarified: *"Some agriculture keeps us going when there is no work and the market continues to fluctuate."* These accounts highlight the double pressures of rising living costs and intensifying insecurity in urban labour markets that increasingly compel households to adopt urban agriculture (UA) as a survival and coping mechanism. UA here has less to do with commercial agribusiness and everything to do with the practical negotiation of daily urban life. In the words of Namwata (2013) and Namwata *et al.* (2015), UA constitutes "an informal infrastructure of resilience", a localized, adaptive response to urban precarity. Hovorka (2006) emphasizes that UA is a socio-spatial negotiation, by means of which marginally titled city dwellers make sense of access to food and land in a competitive and exclusionary landscape. It is not merely a livelihood activity but also a spatial politics of resistance whereby the urban poor claim their right to the city. By cultivating neglected or off-center urban land, often in contravention of formal land-use regulations, urban agriculturists gain visibility, presence, and legitimacy in the city (Mougeot, 2006). Accordingly, UA is both a political praxis and a survival tactic rooted in wider struggles for spatial justice, recognition, and fairness in a rapidly changing urban terrain.

4.2.4 Duration of Engagement in UA Activities

Table 5 indicates that most of the respondents began engaging in UA between the early 1980s and mid-2000s, with a spike post-2005. This is in line with the post-liberalization period when Structural Adjustment Programs (SAPs) and labor market deregulation reduced formal employment, pushing many into informal livelihoods, such as agriculture (Lwasa *et al.*, 2014; Namwata, 2013). The difference between settlements was statistically significant ($p < 0.05$), with previous engagement more common in squatter settlements, as would be expected given their increased previous vulnerability and earlier application of land-based coping strategies.

Table 5*Duration of Engagement in UA Activities (n=300)*

Duration of Engagement in UA Activities	Area of Residence				All (n = 300)	Chi-square Value
	Squatter (n = 119)	Non-Squatter (n=181)				
	N	%	N	%	N (%)	
1980-1985	14	11.8	27	14.9	41 (13.7)	17.18
1986-1990	30	25.2	24	13.3	54 (18.0)	
1991-1995	16	13.4	13	7.2	29 (9.7)	
1996-2000	18	15.1	26	14.4	44 (14.7)	
2001-2005	11	9.2	42	23.2	53 (17.7)	
2005+	30	25.2	49	27.1	79 (26.3)	

Note: Percentage figures in parentheses indicate the overall percentage for each variable. Results are significant at 5% level.

One city planner summarized:

"After the 1990s, people turned to urban agriculture, not because they wanted it, but because they had to. There were few jobs to go around, but land, even illegal land, was something that people could make use of."

This is supported by how UA operates as a pressure relief valve, absorbing urban labor shed by structural economic reforms. Self-provisioned and informal, it had filled a gap left by a retreating state and shrinking urban safety nets. The evidence thus supports Namwata *et al.* (2015), Namwata (2013) in affirming that UA is not a transitory or marginal exercise, but a viable livelihood strategy, evolving in sync with urban planning and economic restructuring.

4.3 Spatial Distribution of UA Activities

As shown in Table 6, UA activities were mainly concentrated on residential plots at 64%, followed by public land at 13.7% and peri-urban margins at 10%. Lower percentages were seen on wastewater plots, road verges, and floodplains. Interestingly, no statistically significant spatial difference of UA distribution between settlement types was found to be present, beyond a 0.05 p-value. This implies that urban space is tapped opportunistically in both formal and informal sectors. This is supported by previous research by Namwata *et al.* (2015), Namwata (2013), and Zezza & Tasciotti (2010), who characterize UA as an overall unplanned, bottom-up process opportunistically making use of marginal or otherwise unallocated urban space. A Mnadani ward female FGD respondent summarized this dynamic:

"We just take up whatever land we have available—whatever little piece, even roadside or along drainage. It is difficult to get formal farmland, so we take what we can."

This quote not only addresses the informality and spatial dynamism of UA but also the proactivity of urban farmers who constantly adjust in terms of land availability. These practices call for more participatory urban planning, one that recognizes UA as a legitimate land use instead of criminalizing it.

Table 6

Spatial Distribution of UA Activities (n=300)

Spatial Distribution of UA Activities (n = 300)

Spatial Distribution of UA Activities	Area of Residence				All (n = 300)	Chi-square Value
	Squatter (n = 119)		Non-Squatter (n=181)			
	N	%	N	%	N (%)	
Public land	11	9.2	30	16.6	41 (13.7)	7.58
Residential areas	84	70.6	108	59.7	192 (64.0)	
Commercial areas	1	0.8	4	2.2	5 (1.7)	
Floodplains/wastewater pond	4	3.4	8	4.4	12 (4.0)	
Along roads, railways, and streets	2	1.7	6	3.3	8 (2.7)	
Periphery of the city	14	11.8	16	8.8	30 (10.0)	
Open spaces	3	2.5	9	5.0	12 (4.0)	

Note: Percentage figures in parentheses indicate the overall percentage for each variable. Results are significant at 5% level.

4.4 Gender Dynamics of Decision-Making in UA Practice

As seen in Table 7, UA decision-making was male-dominated (56%), then 24% joint, and 20% female-dominated decisions. The absence of a significant variation between settlement types ($p > 0.05$) means that prevailing gendered cultural norms are stronger determinants of household-level decision-making compared to spatial or geographic context. This outcome is consistent with research by Namwata (2013) and Namwata *et al.* (2015), who indicate that although UA gender roles remain very traditional, they are gradually evolving as economic conditions and labor demands increasingly adapt. These dynamics highlight the complicated interplay between deeply rooted social structures and newly emerging livelihood strategies in urban and peri-urban settings.

Table 7

Gender Dynamics in Decision-Making for UA Activities (n=300)

Variable	Area of Residence				All (n = 300)	Chi-square Value
	Squatter (n = 119)		Non-Squatter (n=181)			
	N	%	N	%		
Who Decides the Type of UA Practiced in the Household?						1.30
Men dominate	70	58.8	98	54.1	168 (56.0)	
Equal influence	29	24.4	43	23.8	72 (24.0)	
Women dominate	20	16.8	40	22.1	60 (20.0)	
Who Decides How and When the Household Members Engage in UA activities						3.44
Men dominate	60	60.0	72	48.6	132 (53.2)	
Equal influence	26	26.0	45	30.4	71 (28.6)	
Women dominate	14	14.0	31	20.9	45 (18.1)	

Note: Percentage figures in parentheses indicate the overall percentage for each variable. Results are significant at 5% level.

FGDs revealed the diversity of such processes. A male respondent stated:



Whether women or men decide depends on who is putting in work or money, and how significant agriculture is to that household." A woman contributed the following: "Sometimes women make decisions because they are out in the field working longer, even when the men are contributing money or land."

These results are complemented by those of Simon *et al.* (2004) and Kutiwa *et al.* (2010), which point to economic value and labor intensity as redistributing intra-household power in favor of women, particularly in female-headed households or within households with men missing or present in minimal capacity. This changing dynamic is that while formal power remains in men's control, real power is more under the control of women, especially where they are the ones continuously investing labor and care in UA. This necessitates more gender-sensitive UA policy and extension services that value and consolidate women's actual contributions.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The findings of this study reveal that the dominant urban agriculture (UA) practices in Dodoma City include livestock rearing, crop farming, vegetable production, and fruit cultivation. These activities are largely motivated by the need to enhance household food security, diversify incomes, and create alternative employment opportunities, particularly for low-income urban residents. UA gender dynamics follow a clear pattern: men are the primary decision-makers, especially in the strategic or revenue-related aspects of UA, while women are directly engaged in production daily. This reflects entrenched household power structures, although it was noted that subtle trends toward shared decision-making were seen. With urbanization in Dodoma happening at an increased pace and increased reliance on informal UA, like farming on empty spaces and wastewater treatment lagoons, it is now necessary to develop more sustainable and space-effective methods. With no regulation and support, current approaches have land-use conflicts, environmental risks, and health problems

5.2 Recommendations

The Dodoma City Council ought to formally integrate urban agriculture (UA) into formal land use plans by developing zoning bylaws that incorporate UA as an acceptable use of land. The bylaws will demarcate areas for low-risk agriculture and regulate practices, particularly the use of wastewater and public spaces, to ensure environmental and public health. UA models should be encouraged to be financed by NGOs and development partners, such as hydroponics, kitchen gardens, and vertical farming, especially in urban high-density areas. This would include the creation of capacity development programs, such as demonstration farms and training sessions, to enhance technical, entrepreneurial, and practical knowledge for urban farmers, particularly youth and women. Academic and research institutions are also able to undertake applied research to assess the environmental impacts, economic viability, and technical feasibility of advanced UA systems like aquaponics and hydroponics in the urban setting of Dodoma. They are also supposed to formalize best practices and create user-friendly policy briefs to enable informed decision-making. Meanwhile, Community-Based Organizations (CBOs) and farmer associations or cooperatives can complement UA activities by bringing the farmers together in cooperatives to enhance access to markets, inputs, and resources. They also must play an active role in promoting gender equality by ensuring that women are accorded equal opportunities for participation in training, leadership, and household decision-making.

REFERENCES

- de Zeeuw H, Van Veenhuizen R, Dubbeling M. (2011). The role of urban agriculture in building resilient cities in developing countries. *The Journal of Agricultural Science*. 2011;149(S1):153-163. doi:10.1017/S0021859610001279
- DFID. (1999). *Sustainable livelihoods guidance sheets*. Department for International Development. <https://www.enonline.net/attachments/871/dfid-sustainable-livelihoods-guidance-sheet-section1.pdf>
- Drechsel, P., & Dongus, S. (2010). Dynamics and sustainability of urban agriculture: Examples from sub-Saharan Africa. *Sustainability Science*, 5, 69–78. <https://doi.org/10.1007/s11625-009-0097-x>
- Dubbeling M., de Zeeuw H. and van Veenhuizen R. (2010). Cities, poverty, and food. *FUAF Foundation*. Practical Action Publishing Ltd, UK. ISBN: 978-1-85339-709-7
- Ellis, F. (2000). *Rural livelihoods and diversity in developing countries*. Oxford University Press.
- FAO. (2011). *The state of food and agriculture 2010–2011: Women in agriculture – Closing the gender gap for development*. Food and Agriculture Organization. <http://www.fao.org/3/i2050e/i2050e.pdf>
- FAO. (2020). *Urban agriculture: FAO's approach and strategy*. Food and Agriculture Organization. <https://www.fao.org/documents/card/en/c/cb4185en>



- Hovorka, A. J. (2006). The No. 1 Ladies' Poultry Farm: A feminist political ecology of urban agriculture in Botswana. *Gender, Place & Culture*, 13(3), 207–225. <https://doi.org/10.1080/09663690600700956>
- Kutiwa, S., Boon, E., & Devuyt, D. (2010). Urban Agriculture in Low-Income Households of Harare: An Adaptive Response to Economic Crisis. *Journal of Human Ecology*, 32(2), 85–96.. <https://doi.org/10.1080/09709274.2010.11906325>
- Lee-Smith, D. (2010). Cities feeding people: An update on urban agriculture in equatorial Africa. *Environment and Urbanization*, 22(2), 483–499. <https://doi.org/10.1177/0956247810377388>
- Lwasa, S., Mugagga, F., Wahab, B., Simon, D., Connors, J., & Griffith, C. (2014). Urban and peri-urban agriculture and urban planning. *International Development Planning Review*, 36(1), 47–66. <https://doi.org/10.3828/idpr.2014.5>
- Mkwambisi, D. D., Fraser, E. D. G., & Dougill, A. J. (2011). Urban agriculture and poverty reduction: Evaluating how food production in cities contributes to food security, employment, and income in Malawi. *Journal of International Development*, 23(2), 181–203. <https://doi.org/10.1002/jid.1657>
- Mougeot, J. A. (2006). *Agropolis: The social, political, and environmental dimensions of urban agriculture*. Earthscan.
- Mwajombe, K. K. (2011). *Urban agriculture indices in selected towns in Tanzania and some issues on technical efficiency: Implications for urban agricultural extension services* (Doctoral dissertation, Sokoine University of Agriculture, Morogoro, Tanzania).
- Namwata, B. M. L. (2013). *Integration of urban agriculture in urban planning for poverty alleviation in Tanzania: A case of Dodoma Municipality* (Doctoral dissertation, University of Dodoma).
- Namwata, B. M. L., Kikula, I. S., & Kopoka, P. A. (2015). Access of urban farmers to land, water, and inputs for urban agriculture in Dodoma Municipality, Tanzania. *Journal of African Studies and Development*, 7(1), 31–40. <https://doi.org/10.5897/JASD2014.0328>
- Orsini, F., Kahane, R., Nono-Womdim, R., & Gianquinto, G. (2013). Urban agriculture in the developing world: A review. *Agronomy for Sustainable Development*, 33(4), 695–720. <https://doi.org/10.1007/s13593-013-0143-z>
- Poate, C. D., & Daplyn, P. F. (1993). *Data for agrarian development*. Cambridge University Press.
- Scoones, I. (1998). *Sustainable rural livelihoods: A framework for analysis* (IDS Working Paper No. 72). Institute of Development Studies. <https://www.ids.ac.uk/publications/sustainable-rural-livelihoods-a-framework-for-analysis/>
- Simon, D., McGregor, D. and Nsaih-Gyabaah, K. (2004) The Changing Urban-Rural Interface of African Cities: Definitional Issues and an Application to Kumasi, Ghana. *Environment and Urbanization*, 16(2), 235–247. <https://doi.org/10.1177/095624780401600214>
- Zeza, A., & Tasciotti, L. (2010). Urban agriculture, poverty, and food security: Empirical evidence from a sample of developing countries. *Food Policy*, 35(4), 265–273. <https://doi.org/10.1016/j.foodpol.2010.04.007>