



# Urban Agriculture and the Sustainability Nexus in South Africa: Past, Current, and Future Trends

Tinashe P. Kanosvamhira<sup>1</sup> 

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## Abstract

Urban agriculture remains a topical issue that needs to be better understood in striving for sustainable cities, particularly in sub-Saharan Africa. Through a literature review, this article examines urban agriculture studies in South Africa to identify trends, opportunities, and gaps in the literature. The article examines the discourses that have emerged based on a narrative literature review of 62 peer-reviewed articles from 1993 to 2022. The findings indicate that several gaps in the knowledge limit our understanding of the practice of urban agriculture toward sustainable cities, for instance, an under-representation of secondary cities and the general productivist focus of most studies in the country. The author argues that future research needs to focus on underrepresented cities using rich methodologies to gain further insights into urban agriculture and its place in the city. Moreover, other under-represented themes including environmental benefits such as green infrastructure and nature-based solutions need more exploration. A more holistic understanding of urban agriculture is required in order to buttress interventions that accommodate the practice within the urban environment.

**Keywords** Urban agriculture · South Africa · Sustainable cities · Productivist

## Introduction

Contemporary research echoes the capacity of urban agriculture to contribute to sustainable cities (Anzure et al., 2019; Khosravi et al., 2022; Rao et al., 2022). This is particularly true in global South cities characterized by rapid urbanization that poses significant sustainability challenges (Modibedi et al., 2021). Within this context, urban agriculture receives much attention due to its capacity to contribute to household food and nutrition security in African cities

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✉ Tinashe P. Kanosvamhira  
kanostk1@gmail.com

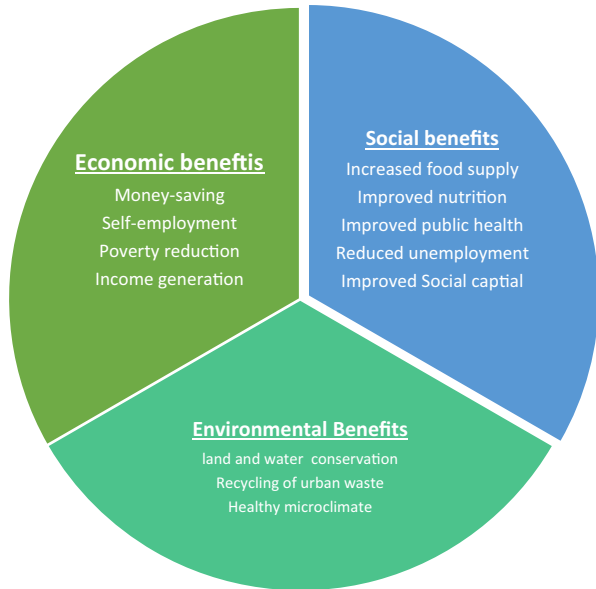
<sup>1</sup> University of the Western Cape, Department of Geography Environmental Studies & Tourism, Cape Town, South Africa

(Mkwambisi et al., 2011; Hampwaye et al., 2007). Its contribution to employment and income generation has been largely contested due to unreliable data on the practice (Tevera, 2023). Nonetheless, urban agriculture is not only a source of food but provides other benefits, for example, community building, health promotion, and education (Rao et al., 2022). In this way, urban agriculture can contribute to sustainable development due to its multi-dimensional benefits (Game & Primus, 2015, Khosravi et al., 2022). The multi-dimensional benefits of the practice fit into the tripartite facets of sustainable development inclusive of social, economic, and environmental facets (Anzure et al., 2019). Urban agriculture refers to small areas such as vacant plots, gardens, verges, balconies, and containers within the city utilized to grow crops and raise small livestock for own consumption or sale in neighborhood markets' with the potential to provide a source of food and income for urban dwellers (FAO, 2022). This paper uses this broad definition because it is clear and captures the variations of the practice in the literature.

Despite the multiple benefits of urban agriculture and its ability to fulfill sustainable cities, most city authorities in the global South give little attention to urban agriculture (Anzure et al., 2019, Cilliers et al., 2020). The literature argues that this is driven by the belief that urban agriculture does not constitute the best use of the city's land (Modibedi et al., 2021). This belief may have been fueled by the lack of clarity of the narrative in the conventional literature about the role of urban agriculture in building sustainable cities (Anzure et al., 2019). Hence, there is still a gap in the knowledge that exists when it comes to appreciating the role of urban agriculture particularly in global South cities (Rao et al., 2022) such as South Africa. Cilliers et al. (2020) argue that more evidence is therefore required to convince policymakers in South African cities to invest more in urban agriculture and its capacity to contribute to sustainable city development. Moreover, the literature in South Africa has presented some contradictory positions on the potential of urban agriculture with some of the scholarship arguing its contribution to household nutrition and income is exaggerated (Webb, 2011; Crush et al., 2011) as opposed to some who argue it possesses some potential to meet these (Rogerson, 1993). So there is a need for improved knowledge when designing urban green spaces that can maximize social, economic, and environmental benefits.

In this respect, the objective of this paper is to examine the development of the urban agriculture discourse in South Africa over the past few decades (1993–2022) as a prerequisite to examining trends and opportunities for future research within the context of sustainable cities. The remainder of the paper is structured into six parts. The following section explains the conceptual underpinnings of this research, showing the nexus between urban agriculture and sustainable development. The third section covers the study area. The fourth section presents the methods used to collect and analyze data while the fifth presents the findings. The sixth section presents a discussion of the results of the study and the final section discusses policy relevance and key takeaways from the literature on urban agriculture and implications for future research.

**Fig. 1** The benefits of urban agriculture toward sustainable cities



## Urban Agriculture and the Sustainable City

Due to the high rates of urbanization in global South cities, it is recognized that cities will play a major role in sustainable development (Anzure et al., 2019). The concept of sustainable cities is derived from the United Nations World Commission on Environment and Development's (UNWCED) concept of sustainable development. Here, sustainable development is defined as the capacity of the present generation fulfilling its needs without denying the future generations the same capacity. The recognition that cities will play a role in this is indicated through the adoption of the Sustainable Development Goal "sustainable cities" (SDG) 11 from the 2030 Agenda for Sustainable Development. Since the emergence of the sustainable development discourse, the literature recognizes that cities play a pivotal role because they affect resource demand management and urban climate-related strategies (Michalina et al., 2021). Within this context, urban agriculture is recognized as a potential activity that could contribute to sustainable cities due to its multi-faceted benefits (Game & Primus, 2015; Khosravi et al., 2022) that feed into all three social, economical, and environmental facets of sustainable development (Anzure et al., 2019) (see Fig. 1).

Despite the progress that has been achieved at a global level in recent years to help guide and drive local, national, and regional processes for sustainable development, many knowledge gaps still exist that might hinder the implementation of SDG11 (Anzure et al., 2019). Therefore, it is important for policymakers in global South cities to wholly understand urban agriculture and the linkages it offers to sustainable development which can ultimately aid in the devising of sustainable development strategies (Rao et al., 2022). This paper uses this understanding to assess the development of the discourse within urban agriculture studies in relation to sustainable development.

## Study Area

South Africa has approximately 67% of its population residing in urban areas. This makes it one of the most urbanized countries on the continent with an estimated increase of 80% in 2050 (UN-Habitat, 2021). This rapid urbanization has been characterized by various challenges including land degradation and also increased rates of unemployment (Cilliers et al., 2020). For instance, recent statistics show that more than half the population lives in poverty (StatsSa, 2017). Additionally, food and nutrition security is a major problem across South Africa. Despite the country being food secure nationally, food insecurity persists, for instance, in 2020 approximately 41.5% of South Africans were food insecure<sup>1</sup> (StatsSA, 2022). The problem is more acute in cities due to food security being a function of financial and geographical access (Kroll, 2016). Therefore, it is no surprise that food insecurity prevails in urban households due to their reliance on income to purchase food (Greenberg, 2015). However, such drivers of food insecurity are largely ignored. For instance, research has shown that there is unequal access to supermarkets and healthy food options across neighborhoods in Cape Town (Battersby & Peyton, 2014).

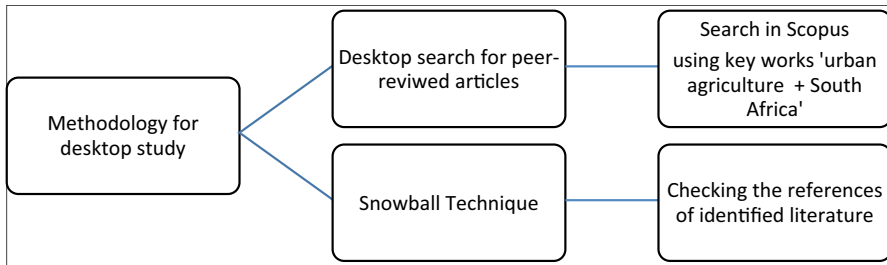
Although supermarkets have rapidly expanded into low-income areas, the supermarkets in such places do not stock healthy food compared to those in wealthier neighborhoods (Battersby & Peyton, 2014). In fact, the expansion of these supermarkets through the introduction of malls is also characterized by the presence of fast-food chains. Large-scale food corporations have transformed consumer dietary patterns by providing highly processed food options generally low in nutrient density with high carbohydrates, fat, sugar, and sodium (Greenberg, 2015). This nutrition transition contributes to various food choice-related illnesses, such as diabetes and high blood pressure (FAO, 2022). Consequently, South Africa has one of the world's highest obesity levels (Tsegay & Rusare, 2014). In response to this problem, various municipalities across the country in the past have supported urban agriculture projects through projects and also policies for instance, in Cape Town (Kanosvamhira & Tevera 2022b) and Johannesburg (Malan, 2015). As will be shown in Section 5 of the article, several studies investigated urban agriculture from varying angles. For this reason, South Africa is deemed a suitable case study for this paper.

## Methodology

The study followed a narrative literature review of peer-reviewed articles on urban agriculture in South Africa to identify the articles for the study. The article sought to bring to the fore the unbalanced nature of studies on urban agriculture as opposed to providing an exhaustive database of all the literature on the subject. For this reason, the narrative literature review was deemed the most appropriate. The primary

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<sup>1</sup> According to the report, 26.3% were affected by moderate to severe food insecurity, while almost 14.9% experienced severe food insecurity.



**Fig. 2** Methodological process for desktop study (source, Author, 2022)

purpose of a traditional or narrative literature review is to summarize or analyze a body of literature to highlight gaps, inconsistencies, and new research streams (O’Gorman & Macintosh, 2015). This type of literature review is typically different from other forms of literature review such as systematic reviews that aim to identify all the literature in the topic area to ensure that no existing understanding or knowledge is missed.

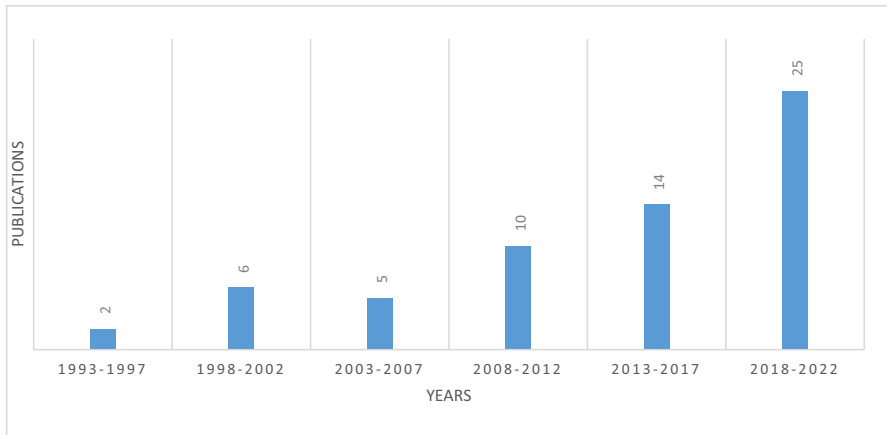
The literature search was conducted from Scopus following a Boolean/Phrase search mode where the primary keyword “urban agriculture was combined with “AND” before connecting with the secondary keywords ‘South Africa,’” (Fig. 2). Scopus is one of the largest databases of academic literature (Candel, 2014); hence, it was deemed appropriate given what the study attempted to achieve.

An initial search resulted in 421 hits on Scopus. The next stage included the identification of studies that focused on South Africa and specifically on urban agriculture. Search results were screened by the author based on potentially relevant abstracts. The selected studies were compiled into a Microsoft Excel spreadsheet. Moreover, only journal articles with an empirical scope were included in the final articles identified; hence, review articles were excluded. Additional articles were identified through the references list of the selected articles from which suitable articles were included in the sample. This backward reference searching allowed the identification and examination of the references cited in an article helping to understand what led to the initial article identified. This article covers 62 peer-reviewed journal articles from 1993 to 2022 (Fig. 3)<sup>2</sup>.

To analyze the articles, content analysis was conducted using set of guide questions that addressed geographical, theoretical, methodical, and content-related aspects. The author, journal, location, year of study, methods, results, and overall themes of each study were captured. This ensured that basic patterns could be identified for analysis, such as the disproportion of studies based on geographic settings and the dominant methodologies used across the studies<sup>3</sup>.

<sup>2</sup> The year 1993 was selected as the starting point because there were no hits for literature prior to 1993.

<sup>3</sup> A second reviewer although not included as a contributor in this publication oversaw the entire review process to minimize subjectivity, bias and human error.



**Fig. 3** Publications on urban agriculture (period 1993–2022)

## Findings

The findings indicate that there has generally been an increase with regard to the studies focusing on urban agriculture activities over time. The first journal article on urban cultivation appears in 1993. This is the only publication published between 1993 and 1997 with up to approximately 30 publications being published in the last pentad. This generally signifies increased interest in urban agriculture in South Africa. When it comes to the geographical scope, the findings indicate that a majority of the studies have been conducted in mainly 3 provinces namely Gauteng (23%), Western Cape (50%), and the Eastern Cape (15%). Most of the studies have been focused on the Western Cape and some provinces do not have studies focusing on urban agriculture, for instance, in Mpumalanga and Limpopo (see Table 1). A deeper look into the findings indicates that in the provinces where most of the studies have been conducted, studies are typically based on primary cities. For instance, in the Western Cape, most studies are based on Cape Town (e.g., Tembo & Louw, 2013; Olivier, 2018; Paganini et al., 2018; Kanosvamaha, 2019; Kanosvamaha, 2021; Kanosvamaha & Tevera 2022a). A similar trend is noticed when one looks at the province of Gauteng where most of the studies focus on Johannesburg (e.g., Ruysenaar, 2012; Malan 2020). There appears to be a dearth of studies focusing on smaller towns except for a few towns in Peddie in the Eastern Cape (Thornton, 2008) and Makhanda (formerly known as Grahamstown) in the Eastern Cape (Moller, 2005), Buffalo City in the Eastern Cape (Phiri, 2008) and George in the Western Cape (Sibert, 2020).

The majority of the research employs qualitative research designs (54.8%) to collect data with the next category exploiting quantitative methods (21%) (see Table 2). Only 24.2% of the studies combine qualitative and quantitative methods to collect their data. The articles employ a wide range of methods to collect data under each of their desired research design; for instance, quantitative data is typically collected through the use of close-ended questionnaires, qualitative

**Table 1** Classification of publications according to province from 1993 to 2022 (Classification excludes 10 studies which focus on two or more provinces.)

Time period in pentades	Classification of studies based on province										Total in each pentade
	Western Cape	Gauteng	Free State	Eastern Cape	North West	Mpumalanga	Northern Cape	Limpopo	KwaZulu-Natal		
1993-1997	-	-	-	0	0	-	-	-	-	-	0
1998-2002	2	-	1	-	0	-	-	-	-	-	3
2003-2007	1	1	-	2	0	-	-	-	-	-	4
2008-2012	1	2	-	4	0	-	-	-	1	-	8
2013-2017	8	4	-	1	0	-	-	-	1	-	14
2018-2022	14	5	-	1	1	-	-	-	2	-	23
Total	26	12	1	8	1	0	0	0	4	4	52

Source: author (2022)

**Table 2** Research designs employed according to the province

Province	Research design		
	Quantitative	Qualitative	Mixed Methods
Free state	-	1	-
Gauteng	1	9	2
Eastern Cape	1	4	3
Northwest	1	-	-
Western Cape	4	13	9
KwaZulu-Natal	3	-	1
Other <sup>a</sup>	3	7	-
Total	13	34	15

Source: Author, 2022.

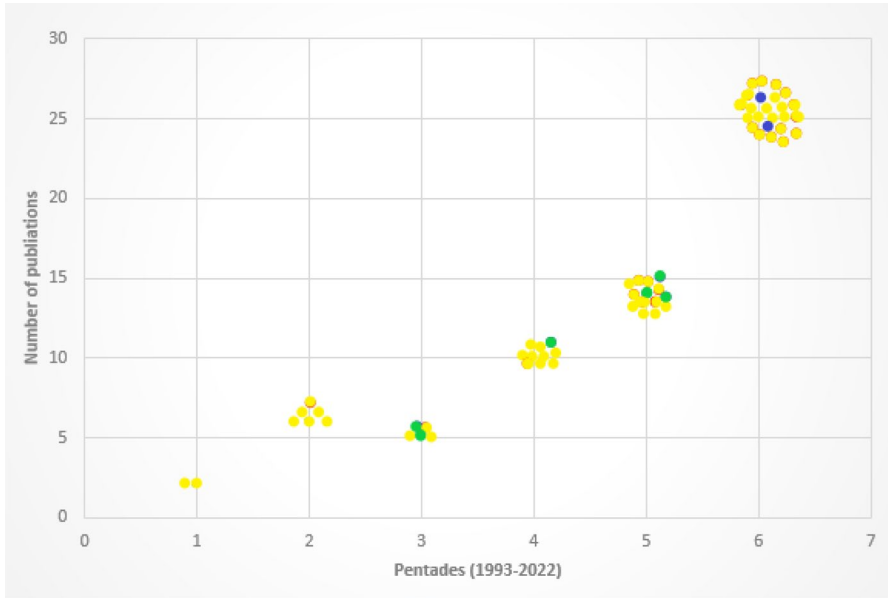
<sup>a</sup>Other captures the category consisting of the studies that focus on cities across multiple provinces

data collected through interviews, text analysis, focus groups, case studies, and observations. There has been also an exploration of contemporary qualitative research methods such as the use of photo-voice (see Lucke, Mamo & Koenigstorfer, 2019) and also action research (see Paganini & Stöber, 2021) generating a deeper insight into the issues under question. Mixed methods typically involve a mixture of both tools, predominately, questionnaires, in-depth interviews, and semi-structured interviews. Most of the studies source their data from urban farmers but also related stakeholders, for example, government personnel and civil society actors and documents such as government policies and organizational websites.

In terms of themes, the studies were classified according to the social, economic, and environmental scope. The social reasons were identified as those with a focus on community building, food sharing, food security and nutrition, education, and improved health and activism. Environmental reasons were identified as studies with an ecological focus such as air improvement, urban greening, and waste recycling while economic reasons were explained as money-saving and income generation. Findings from this narrative review indicate that a majority of the studies have focused on social aspects of urban agriculture (85.3%), followed by economic (11.4%) and lastly environmental (3.2%) (see Fig. 4). This does not suggest that some studies do not explore multiple themes; however, the categorization was conducted on the basis of the major theme explored.

A look into the studies focusing on social aspects reveals that such studies focus on issues of health and food security, education and civic engagement, and gender equity. Most of the studies under this theme focus on the productivist theme of food and nutrition security (e.g., Shackleton et al., 2010; Chakona & Shackleton, 2017, Swanepoel et al., 2021; Lucke, Mamo & Koenigstorfer, 2019; Swanepoel et al., 2021; Steenkamp et al., 2021; Du Toit et al., 2022; Crush et al., 2011; Crush & Caesar, 2014; Dyer et al., 2015; Frayne, McCordic & Shilomboleni, 2014;





**Key**

- Yellow dots=social focus
- Blue dots=environmental focus
- Green dots=Economic focus

**Fig. 4** Main themes explored by studies overtime

**Table 3** Main themes explored (This table focuses on 61 articles)

Province	Themes explored		
	Economic	Social	Environ-mental/ ecological
Free state	-	1	-
Gauteng	1	10	1
Eastern Cape	1	7	-
Northwest	-	1	-
Western Cape	-	22	3
KwazuluNatal	-	3	1
Other <sup>a</sup>	-	9	2
<b>Total</b>	<b>2</b>	<b>53</b>	<b>6</b>

Source: author

<sup>a</sup>Other captures the category consisting of the studies that focus on cities across multiple provinces

Philander & Karriem, 2016). In fact, this has been the main criticism of such studies, especially in primary cities such as Cape Town (see Slater, 2010). Nonetheless, some studies focus on post-productivist social themes of networking and social

capital (see Kanosvamaha, 2019; Kanosvamaha & Tevera, 2020; Kanosvamaha & Tevera, 2022a; Malan 2015, 2020, 2021; Wessleman & Maleshe, 2019) and food sovereignty (Sierbert, 2020) (Table 3).

Some studies have focused on the financial benefits of urban agriculture (Thom & Conradie, 2013; Dyer et al., 2015; Bbun & Thornton, 2013) as well as its capacity to create employment, income generation and saving, and expenditure (eg. Webb, 1998, 2000, 2011; Webb & Kasumba, 2009; Reuther & Dewar, 2006) as well as improving the legalization of urban agriculture to improve its capacity toward household food security (Suchá et al., 2020; Suchá, & Dušková, 2022). A limited number of studies have looked at the aspect of environmental benefits of urban agriculture, for example, urban greening (Cilliers et al., 2020) and climate change (Chitakira & Ngcobo, 2021). Chitakira and Ngcobo (2021) explore climate-smart agriculture approaches by small-holder farmers to address the impacts of climate change on agricultural production in Tshwane. Cilliers et al. (2020) conducted research to explore the potential of urban agriculture as a greening tool in specific cities in South Africa. More broadly, there is an uneven distribution of studies across the three major pillars which constitute of sustainable development.

## Discussion

There has generally been an increase in studies focusing on urban agriculture over the years (see Table 1). Although urban agriculture is an old activity, before the 1980s, limited information existed regarding the extent or significance of the practice in South Africa (May & Rogerson, 1995; Webb, 2011). The only evidence of the viability of urban agriculture was based on case studies from other African and Asian cities and the endorsement of the activity by international organizations (Rogerson, 1993). This coincides with the limited number of studies focusing on the activity post-apartheid. Without much literature at the time, research took an advocacy role based on case studies elsewhere and the development discourse promoted by international institutions such as the World Bank research, the International Labor Organization, Food, and Agricultural Organization, the Canadian International Development Research Center, the Resource Centers on Urban Agriculture and Food Security and the United Nations (Webb, 2011). For instance, Rogerson's writings encouraged municipal governments and the academic community to look into the potential of urban agriculture as a livelihood tool within the context of unemployment and urban poverty (see Rogerson, 1993, May & Rogerson, 1995; Rogerson, 1998).

In 1989, food security was a significant concern in the country due to a rise in unemployment and surging food prices, which had devastating effects on the urban poor. Between 1991 and 2001, there was an increase in rural to urban migration of people who went to urban centers searching for employment (Rogerson, 1998). The government and NGOs launched several initiatives to address urban poverty in low-income areas. One of these strategies was encouraging urban citizens to partake in urban cultivation to contribute to household food security (Rogerson, 1993). As a result of these initiatives, several urban gardening projects mushroomed, specifically

in townships and informal settlements in the 1980s and 1990s. Traditionally, urban agriculture was labeled as an illegal activity under the apartheid planning system (Modibedi, Masekoameng, & Maake, 2021). Therefore, there was no recognition of urban agriculture as a livelihood option from the local governments, and the activity was not included in any planning and land use activities. Hence, most of the work at the time is what Webb (2011) would call advocacy work rather than recommendations based on sufficient evidence. Scholars such as May and Rogerson (1995) argued that urban agriculture was a crucial livelihood option, especially for the women who were the main partakers in the activity. Even then, the studies were critical of urban agriculture activities. May and Rogerson (1995) argued that although agriculture was a livelihood option for the poor, it was not the most effective survival stratagem for the urban poor. For instance, Rogerson (1993) stated that residents preferred the more economically beneficial option of erecting a backyard for rentals as opposed to cultivating land.

Accordingly, the bulk of the literature during the 1990s and 2000s showcased the potential of urban agriculture to contribute to household food security and income generation (Belete et al., 2005; Reuther & Dewar, 2006; Thornton, 2009; Thornton & Nel, 2007). The literature focused on understanding the motivations behind the resident's engagement in urban agriculture reporting the strong presence of the need to fulfill household requirements and generate income (Karaan & Mohamed, 1998; Moller, 2005). The advocacy work eventually saw several local governments embrace urban agriculture as a solution to household food security (Battersby & Peyton, 2014). Support for urban agriculture also grew from provinces and municipalities across the country, for instance, in Cape Town (Rogerson, 2010; 2011), Johannesburg (Ruysenaar, 2012), and eThekweni (Beall & Todes, 2004). The City of Johannesburg adopted a Food Resilience Policy in 2012 (Malan, 2015). At provincial level, Gauteng supported urban agriculture through the Gauteng Agricultural Development Strategy, while the Western Cape achieved this through the Department of Agriculture's Urban Renewal Program (Rogerson, 2011). In eThekweni, despite unclear plans and guidelines, the municipality offered various support programs that support urban agriculture activities in low-income areas "mainly for socio-economic impact purposes associated with food availability and livelihood creation" (Bisaga, Parikh, & Loggia, 2019:15). The increased support of urban agriculture in these specific areas explains the high number of publications focusing the provinces of Gauteng, Western Cape, and Kwazulu Natal areas as opposed to other areas.

On the other hand, an alternative discourse was already emerging in the early 2000s, which argued that the economic and household food security potential of urban agriculture was exaggerated. This was also due to some studies that indicated the limitations of urban agriculture and depicted it as a safety net for the poor. More case studies began to indicate that urban agriculture did not significantly contribute to household food security and nutrition (Crush et al., 2011; Frayne, McCordic, & Shilomboleni, 2014; Webb, 2011). Webb (2011) and argued that there was no evidence that urban agriculture was a livelihood option for the urban poor. In Ezebelini (Queens Town, Eastern Cape), Webb and Kasumba (2009) conducted a study on the benefits of urban agriculture on low-income households. Their study findings

demonstrated that the financial benefits from urban agriculture were negligible. Thornton (2008) in Peddie (Eastern Cape) reported that social grants were the primary survival strategy for the urban poor. Across informal settlements in Pretoria, Van Averbeke (2007) conducted a study to provide quantitative information on the material benefits attained from urban gardening. The author reported that the contribution of urban agriculture toward household income and food security was generally modest; hence, the assertion urban agriculture benefits the pro-poor urbanites was improbable (Webb, 2000; Crush et al., 2011).

On a larger scale, AFSUN conducted a study based on a survey of 1 060 households from Philippi, Ocean View, and Khayelitsha (Cape Town) reporting that the level of participation in urban agriculture activities was very low among the urban poor. Moreover, among the participating households, a limited number was food secure as a result of gardening activities (Crush et al., 2011). Frayne et al. (2014) reported that urban agriculture did not make any significant contribution to the income or food security status of engaging households. Their study was based on a household survey focusing on 11 cities in Southern Africa including Johannesburg and Cape Town with a sample size of 996 and 1060 households, respectively. Their quantitative analysis was unable to report any significant relationship between food security and urban agriculture. Hence, they conclude by questioning policymakers who support urban agriculture as a poverty alleviation strategy. Scholars such as Webb (2000) essentially claimed that the advocacy of urban agriculture as a livelihood option was linked to the broader developmental discourse instead of local empirical evidence.

In response, the literature qualified that the activity had “the potential” but there were several structural barriers that militated against the success of the activity. For instance, in Cape Town, Reuther and Dewar 2006:97 conducted a study evaluating the SCAGA garden in Khayelitsha. After identifying the various challenges, the community gardeners faced, they concluded urban agriculture could be “economically viable” if various other militating factors could be addressed. In Peddie, Thornton and Nel (2007) examined the Masizame Community Garden project and cautiously reported that the garden could generate income and contribute to household food security arguing that urban agriculture’s full potential was significantly affected by “structural historical and socioeconomic barriers” (Thornton & Nel, 2007:13). The literature showed the challenges which made urban agriculture difficult to practice and fulfill its potential, for instance, land tenure insecurity (Thornton, 2009), limited access to markets (Thom & Conradie, 2013), poor infrastructure, limited extension services, poor policy frameworks (Rogerson, 2011), and poor soils among others. Therefore, there was an understanding that addressing these underlying problems could improve the viability of the activity (Roberts & Shackleton, 2018). To this day such studies do exist, for instance, Bisaga et al. (2019) use a mixed-methods approach to examine the challenges and opportunities for urban agriculture in the context of under-resourced communities in eThekweni. Their findings demonstrate that urban agriculture could make environmental, social, cultural, and developmental if issues such as resources access and enabling policy framework were in place.

From a conceptual level, Battersby and Marshak (2013) argued that the framing of urban agriculture as a solution to food insecurity was based on the rural conception

that food insecurity could be addressed through strategies of increasing household food production. Unfortunately, this approach had been shifted to the urban centers when in fact household food insecurity in urban centers is an issue of access rather than availability. Some of the scholarship in line with this sought to understand why people engaged in urban agriculture activities beyond the limited economic gains from the activity. For instance, Slater (2010) argued for more research that examined urban agriculture beyond the economist framework to understanding the broader motivations and benefits of urban agriculture practices. Most of the studies prior the 2000s had focused on the economic benefits of the practice; hence, there was a gap in the literature regarding the non-material benefits of urban gardening such as its capacity to contribute to community development (Battersby & Marshak, 2013; Rogerson, 2003). This is not to say previous studies did not acknowledge this; however, the dominant discourse minimized the focus on other themes (see Nell et al., 2000). For instance, in a 2003 study, Rogerson notes that there was limited investigation of other aspects of agriculture such as social and environmental benefits.

Studies stressing a focus on other concomitant benefits of the practice began to emerge (Battersby & Marshak, 2013; Olivier, 2019; Slater, 2010). Perhaps, the most highlighted of such studies was conducted in Cape Town by Slater, who examined the benefits of urban agriculture among 11 women from community gardens in the Langa, Khayelitsha, and Crossroads in the Cape Flats. Nevertheless, there were already a few other studies engaging in this discourse, for example, Jacobs and Xaba (2008) and Wills et al. (2009). Hence, it would be inaccurate to state that the discourse was rather linear without any outliers. Slater (2010) argued that most of the research in Cape Town was productivist and largely quantitative focusing on economic gains of urban agriculture. Through a life story methodology, her results demonstrated that urban agriculture for women extended beyond economic gains providing a sense of empowerment.

More of such research became dominant exploring the multiple benefits of urban agriculture, for example, social benefits (Battersby & Marshak, 2013; Jacobs & Xaba 2008; Kanosvamhira & Tevera, 2019). Nevertheless, more of these studies were in Cape Town. Battersby and Marshak (2013) conducted a qualitative study investigating the perceived benefits of urban agriculture among gardeners supported by a local NGO in Vrygrond and Seawinds. Their findings revealed that there were minimal economic benefits obtained from the practice; instead, the gardeners engaged in the practice for reasons that extended beyond the material benefits such as social capital. Recent studies have sought to indicate how urban agriculture contributes to social capital development in distressed communities (Kanosvamhira & Tevera, 2019; Olivier & Heinecken, 2017b, 2017a; Hosking & Palomino-schalscha, 2016). For example, in Cape Town, Olivier and Heinecken (2017b) showed that gardening was a tool to foster social cohesion among gardeners and the local community.

Most recently, Siebert (2020) explores urban cultivation as a form of social movement in response to the neoliberal food system. This is perhaps one of the few studies that provide crucial information on the transformative nature of urban food producers. It appears that scholars began to explore such issues after an exhaustion of the productivist elements of urban agriculture (see, Paganini & Lemke, 2020; Kesselman et al., 2021). Nonetheless, a number of studies still focus on the productivist elements of

urban agriculture. For instance, in Tongaat, eThekweni, Khumalo and Sibanda (2019) conducted a study to examine the link between urban agriculture and food security. Based on their analysis, they argue that although gardening improved food availability, the results are inconclusive to show that gardening households have a better dietary diversity as compared to non-gardening households. This is not to say studies in bigger regions like Gauteng do not explore such issues still; however, a bulk of the studies now focus on other themes such as stakeholder participation and dialog to ensure urban agriculture's success (Kanosvamaha, 2019; Malan, 2015, 2020, 2021). Only a few studies have explored urban agriculture within the context of environmental benefits. For instance, Chitakira and Ngcobo (2021) explore climate-smart agriculture approaches by small-holder farmers to address the impacts of climate change on agricultural production in Tshwane. Cilliers et al. (2020), on the other hand, explore the potential of urban agriculture as a greening tool in specific cities in South Africa. Hence, a knowledge gap exists in our understanding of how the activity can contribute to various environmental aspects such as emissions, water management, waste management, and energy use.

## Conclusion

There has been an increase in the number of studies focusing on urban agriculture in South Africa. These have used several methodologies to improve our understanding of the role of urban agriculture and its place in cities. Nevertheless, there is a clear geographical bias with research papers disproportionately focusing on primary cities such as Cape Town, Johannesburg, and Durban. The unequal geographical scope of studies has resulted in an uneven understanding of urban agriculture in South Africa. For instance, cities such as Cape Town have exhausted primary themes hence the focus on more post-productivist themes. In addition, with a handful of exceptions, most of the research continues to focus on the productivist nature of urban agriculture activities on the background of poverty levels across most South African cities. This paper argues that there is a need to broaden the geographical scope of urban agriculture studies to include secondary cities as this is where the bulk of urbanization will occur. As such, attention needs to be paid to how secondary cities will accentuate food insecurity challenges due to rapid secondary urbanization.

Due to the kind of challenges faced in global South cities, most of the research has tended to take a developmental focus hence focusing on the potential of urban as a solution to problems such as food security and nutrition and income generation. Hence, there has been limited research examining the contribution of urban agriculture toward other core aspect of sustainable development such as environmental and social services. Given such gaps in the literature, the role of urban agriculture in a sustainable city has not yet been portrayed wholly. This limits our understanding of urban agriculture and its place in the city from a holistic level thwarting efforts for policy development from a national to city level. Hence, future research in under-represented geographies needs to go beyond the productivist aspects to explore other themes of urban agriculture which could aid in the understanding of its role against lingering injustices in post-apartheid South African cities. More in-depth case

studies are required to fill in the gaps in the knowledge, more specifically environmental sustainability outcomes.

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