

Article

The Disenfranchisement of Practitioners and the Public Sector in Innovative Urban Farming in Sub-Saharan Africa: Insights from Nigeria

Emmanuel O. Benjamin ¹, Abiola Adegoke ² and Gertrud R. Buchenrieder ^{1,*} 

¹ Department of Social Sciences and Public Affairs, Institute for Sociology and Economics, Universität der Bundeswehr München, 85577 Neubiberg, Germany; emmanuel.benjamin@unibw.de

² Aglobe Development Center, Lagos 100275, Nigeria; abiola.adegoke@aglobedc.org

* Correspondence: gertrud.buchenrieder@unibw.de; Tel.: +49-89-6004-3139

Abstract: Innovative urban farming is crucial for enhancing food security, nutrition, livelihood resilience, and environmental sustainability in Sub-Saharan African cities. However, agricultural policies and extension services often overlook urban contexts, presumably due to resource constraints. Yet, to improve productivity, understanding the challenges and opportunities of innovative urban farming is essential. Exploratory qualitative research, including focus group discussions, was conducted in, Lagos, Nigeria, to gather insights from stakeholders. The analysis, using mind maps and a consensus index, compared the perspectives of private urban farmers and public sector representatives. The urban farmers recognize the potential of circular agri-food technologies, like hydroponics, aquaponics, recirculating aquaculture systems (RAS), drip irrigation, sack farming, and waste upcycling, to boost productivity. However, the urban farmers perceive a lack of public sector support for these innovations. The public sector representatives see the problem as urban farmers' behavioral and educational shortcomings, particularly their lack of coordination and commitment to adopting innovations. These differing views highlight the complex dynamics between urban farmers and local agricultural policymakers. This study emphasizes the need for structural changes and local-level stakeholder dialogues for developing effective urban farming policies in Sub-Saharan Africa.

Keywords: urban farming; innovation; focus group discussion; Sub-Saharan Africa; Nigeria



Citation: Benjamin, E.O.; Adegoke, A.; Buchenrieder, G.R. The Disenfranchisement of Practitioners and the Public Sector in Innovative Urban Farming in Sub-Saharan Africa: Insights from Nigeria. *Land* **2024**, *13*, 963. <https://doi.org/10.3390/land13070963>

Academic Editor: Libang Ma

Received: 11 June 2024

Revised: 26 June 2024

Accepted: 28 June 2024

Published: 1 July 2024



Copyright: © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

In Sub-Saharan Africa (SSA), there is an on-going discourse about the contribution of urban farming and urban agriculture to food and nutrition security (FNS), environmental conservation, and making livelihoods more resilient. According to Mkwambis et al. [1], urban agriculture (henceforth urban farming) is defined as ‘food production conducted in or around urban regions’. While Mkwambis et al. [1], as well as Sangwan and Tasciotti [2], have argued in favor of urban farming, Davies [3] has claimed that the positive impact may be overstated. One important consensus of these studies is that current urban farming practices face major challenges, namely low profitability, the lack of sustainability prospects in the presence of climate change, as well as land tenure insecurity. Furthermore, food and nutrition insecurity and livelihood vulnerability are aggravated by SSA's high rate of urbanization, its growing middle class, and thus the rising urban food demand, which is linked to higher food prices.

Nigeria, with a Global Hunger Index score of 28.3 (putting it at 109th out of 125 countries) in 2023, is not only experiencing a serious level of food and nutrition insecurity, but has one of the highest urbanization rates in SSA estimated at 5.8% per annum [4–6]. Lagos State in southwest Nigeria, with over 20 million inhabitants, is representative of an African city region in need of a sustainable and productive urban agri-food system to feed its rising population [7]. As in other parts of SSA, urban farming in Nigeria suffers from low

productivity [8]. The reasons for low productivity are, among others, a lack of agri-food innovations suitable for an urban context, credit market failure, a scarcity of land suitable for urban farming, land tenure insecurity, and limited public sector support [9,10]. The identification of the challenges, opportunities, and prospects of urban farm practitioners and local civil servants, is very important for the design of policies and interventions targeting city region food systems, aiming at enhancing FNS, livelihood resilience, and environmental sustainability.

This study hypothesizes that the participatory engagement of stakeholders at the grassroots level could drive appropriate and inclusive policies and interventions through new insights into the complex urban agri-food system. Addressing the diverse issues and concerns involved will also go a long way toward contributing to several sustainable development goals (SDGs: SDG 2—Zero Hunger, 3—Good Health and Wellbeing, 8—Decent Work and Economic Growth, 10—Reduced Inequality, and 11—Sustainable Cities and Communities).

Thus, this study explores the effectiveness of participatory research, specifically focusing on stakeholder dialogue around urban farming and innovation. This participatory research discusses the use of circular innovative technical solutions in urban farming, and seeks to identify the challenges and opportunities among the stakeholders. Some of the prospects and circular urban farming approaches under consideration include aquaponics, hydroponics, recirculating aquaculture systems (RAS), drip irrigation, sack farming, animal husbandry, and waste upcycling. An important aspect of this participatory research was ensuring that the voices of the participating urban farm practitioners and local civil servants were heard in achieving a fair, equitable, and unbiased outcome.

This study deployed a focus group discussion (FGD) as the participatory research instrument. A FGD ensures that groups work on a specific subject while taking ownership of the process, with the key outcomes addressing all the issues and concerns and establishing a consensual opinion [11]. The FGD was conducted in the Alimosho Local Government Area of Lagos State in August of 2023, with inputs from key stakeholders, including civil servants from the agriculture unit of the local city government.

1.1. Challenges

A substantial number of urban farmers in SSA lack sufficient access to essential resources, such as land and water [3,12–14]. Thus, resource constraints are a major hindrance to the adoption of innovative farming technologies designed for extensive production systems. Apart from resource constraints, inadequate infrastructure, including energy production and storage facilities, can lead to post-harvest losses, limiting the ability of urban farmers to take full advantage of their produce [13,14]. Furthermore, climate variability in SSA has resulted in erratic rainfall patterns and prolonged droughts, disrupting farming activities [15–17]. There are also several (outdated) policy and regulatory hurdles that have hindered the adoption of innovation in more intensive urban farming [12,14]. The incorporation of urban farming into city planning is often subject to restrictions or a lack of support from local governments and authorities [12–14]. Prain [18], as well as Dubbeling and Merzthall [19], have argued that this is because urban farming innovation is not embedded in public governance and its corresponding policy domains. Another challenge to urban farming innovation is limited access to the appropriate public educational and training facilities [20]. Therefore, poor and vulnerable urban farming practitioners often lack the necessary knowledge and training to implement innovative technologies [14,21]. Credit given for urban farming in SSA represents a relatively modest portion of the overall credit portfolio offered by commercial banks and microfinance institutions [21–23]. Financial institutions often cite operational and climatic risks as the primary rationale for their reluctance to provide financial services to farming practitioners. Additionally, the belief in elevated rates of loan defaults and challenges to effectively recouping overdue payments restrict loan advancements to urban farmers [22,24].

1.2. Opportunities

The rapid growth of urban areas in SSA and the growing middle class present an opportunity for urban farming to meet the increasing demand for fresh, healthy, and locally grown produce [13]. However, Sakho-Jimbira and Hathie [14] argued that only an inclusive urban farming approach that does not only benefit large processors and agribusinesses, will result in a win–win scenario. For instance, urban farming could reduce reliance on imported food, enhance FNS, and provide income-generating activities within the vicinity of towns and cities. It is projected that by 2030, African urban food markets will be valued at USD 500 billion compared to USD 150 billion in 2010 [14]. The deployment of innovation in urban farming could further increase the value of urban food markets' cultivation of conventional, traditional, and underutilized crops, contributing to dietary diversity and, thus, improved FNS [25]. The deployment of innovation in urban farming could provide young adults with employment opportunities and stimulate entrepreneurial ventures [26]. Innovations in urban farming, such as hydroponics and aquaponics, have not only been found to be attractive to young adults in developing countries, but also require relatively little land, water, and up-front investment [14,25,27]. These novel technologies and solutions would not only enable more efficient, productive, and sustainable food production in urban areas, but also address important issues related to resource utilization, circularity, environmental impact, and FNS [28–30].

1.3. Prospects for the Future

Ezeomodo and Egware [31] found that urban farming is a major income-generating activity among households in Nigeria. Slater [32] and Smit et al. [33] argued that urban farming has the potential to engage marginalized groups, as well as provide access to essential technical, financial, and knowledge resources. Its impact on FNS is even more pronounced, as an increase in productivity and thus efficiency, due to the adoption of innovations, has been found to also reduce food deserts in urban areas [21,34]. High-quality, locally grown produce from innovative urban farming could potentially find markets beyond the local community and country, contributing to economic growth and international trade [35]. Furthermore, the adoption of innovations, such as aquaponics, hydroponics, etc., results in sustainable farming techniques that minimize resource use inefficiency and adverse environmental effects [36]. Benjamin et al. [27] found that urban aquaponics, in comparison to conventional aquaculture in Lagos, Nigeria, almost reduced the effluent discharge to zero. Thus, innovative urban farming methods have the potential to alleviate poverty by providing income and healthy food for marginalized communities, improving health and overall wellbeing, and contributing to several of the SDGs [19,34]. Engaging in innovative urban farming is a way to foster a sense of community and local pride as it encourages collaboration and social engagement among urban residents [37].

This study aims to provide insights into the challenges to, and opportunities and prospects of innovation in urban farming in SSA by bringing together the relevant stakeholders for a round-table discussion to constructively exchange ideas and understand different perspectives and perceptions.

2. Materials and Methods

2.1. Study Area

This contribution focuses on the West African sub-region of Nigeria, Lagos State and Alimosho Local Government Area, as a case study. Lagos State has the second-highest population in Nigeria (over 20 million inhabitants), and Alimosho Local Government Area has the highest population (over 3 million) in the state [38,39]. The Alimosho Local Government Secretariat is one of the local governments with an agricultural unit, as well as a substantial number of individuals engaged in urban farming, whose conjoint views and concerns about innovative urban farming challenges, opportunities, and prospects for the future have not been adequately captured. This is due to a lack of literature on the subject matter.

2.2. Focus Group Discussion

This study investigates perceptions about urban farming innovation challenges, opportunities, and prospects from a practitioner and civil servant lens. Given the exploratory nature of this research, qualitative participatory research, similar to that of Kraaijvanger et al. [11] and Tregear et al. [40], was conducted based on a FGD approach. Krueger [41] (p. 254) described FGDs as “carefully planned discussions designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment”. This research method is unique in that it can retrieve a high volume of information in a short time. The collected information is an expression of the cognition of the participants on the subject matter and represents their insights, knowledge, understanding, and experience. This implies that the participants in a FGD take ownership of the process of discussion and the information generated, and attain a certain degree of consensus about the information generated. It also covers group dynamics and processes, such as negotiating power, social networks, and power relations [11]. According to Kraaijvanger et al. [11], the interpretation of FGDs is subjective and requires time due to transcription, revision of the recording, and production of infographics. As FGDs are often not conducted at the grassroots or local level because this would require an attentive analysis to achieve insightful outcomes (see [11]), this analysis intends to fill that gap. Thus, to obtain valuable insights, a consensus index approach was adopted. The consensus index is explained in detail below.

2.3. Focus Group Discussion Process

In August 2023, the first FGD workshop was organized, bringing together urban farm practitioners and civil servants. The workshop took place in the main auditorium of the Alimosho Local Government Area, 3 Bada St, Alimosho, Lagos 102213, Lagos, Nigeria. The urban farming innovations proposed for discussion ranged from aquaponics, hydroponics, RAS, drip irrigation, sack farming, and animal husbandry to the upcycling of organic waste into humus. These farming innovations were chosen due to their scalability and suitability for an urban context, where not only are land and water rather scarce, but other constraints also apply.

The selection of urban farmers was meticulously executed, relying on data collected by a non-governmental organization (NGO), Aglobe Development Center, 18/29 Anjorin St, Oremoji Busstop, Shasha, Lagos, Nigeria. Aglobe Development Center is testing prototypes in the area of aquaponics, RAS, hydroponics, and insect and snail farming, thus attracting visits from regional urban farmers. During these visits, urban farmers expressed a keen interest and willingness to engage in a dialogue process and skill acquisition. Prior to the workshop, these urban farmers were directly invited and politely asked to confirm their participation. Local government civil servants were directly engaged through the office of the chairperson of Alimosho Local Government Area. This process ensured that only the voices of urban farmers and civil servants were considered, maintaining the integrity of the participatory research. A substantial number (i.e., 26 of 27) of the urban farmers that confirmed their attendance attended the workshop. Therefore, the farmer participants were divided into two groups for the FGD: group 1 and 2. Two out of the three invited local civil servants were also present and joined group 1, totaling 13 participants (see Table 1). Group 2 was made up exclusively of urban farm practitioners with 15 participants. Given the limited number of civil servants that participated in the FGD, the focus of this study is on group 1. Furthermore, Van Eeuwijk and Angehrn [42] argued that a typical focus group should consist of 6–12 individuals who have some level of expertise on the subject matter.

Table 1. Participant profiles of group 1 at the FGD workshop in Alimosho Local Government Area, Lagos State, Nigeria.

Participant	SEX	AGE	Practitioner	Urban Farming Type
1	M	31	YES	Aquaculture and Horticulture
2	M	54	YES	Horticulture
3	M	39	YES	Aquaculture
4	M	41	YES	Aquaculture and Horticulture
5	M	53	YES	Aquaculture
6	M	54	YES	Horticulture
7	M	42	YES	Aquaculture
8	M	41	YES	Aquaculture
9	M	29	YES	Aquaculture
10	F	49	NO	Civil Servant
11	F	43	NO	Civil Servant
12	M	30	YES	Animal Husbandry
13	M	42	YES	Horticulture

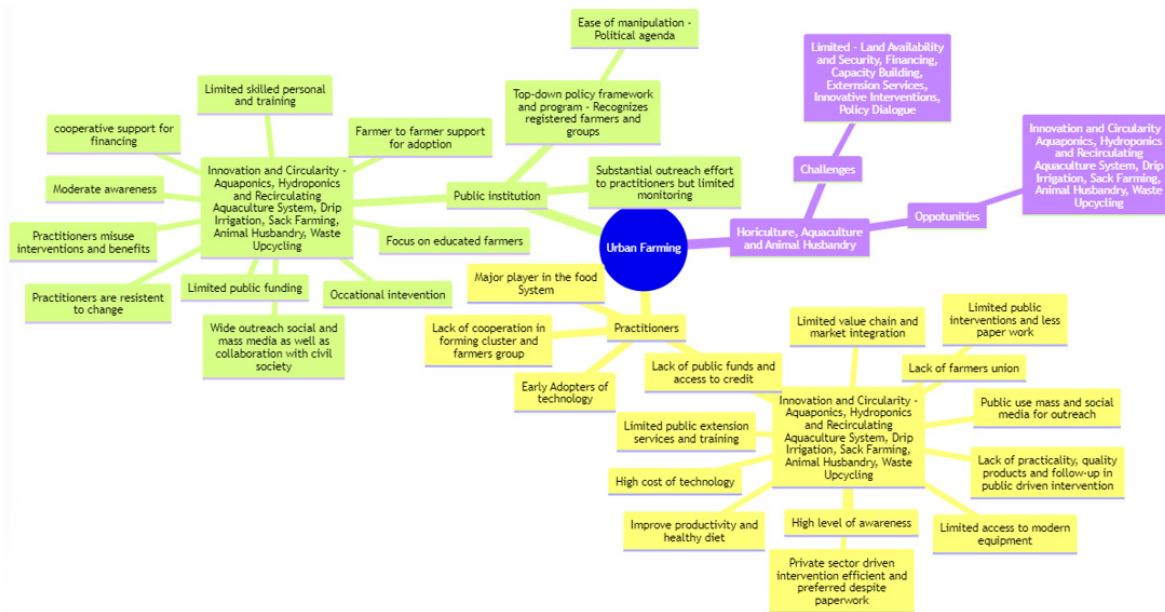
Note: F = female, M = male.

During the FGD, interactions took place between the urban farming practitioners and civil servants, with three researchers involved as moderators and facilitators. These senior and junior researchers, apart from observing and recording the discussion, intervened only when there was a need for clarification about the interview guide, allowing the urban farmers and civil servants to take control and ownership of the discussion. The moderators and facilitators informed the groups about the overall context and objectives of the FGD workshop. The FGD interview guide was divided into three broad topics, with each topic having three to five questions, and was presented to the stakeholders for discussion (see annex I). These questions form the basis of the analysis. They also correspond to the discussed innovations, challenges, opportunities, and prospects of urban farming. Each of these questions was deliberated on during specific sessions, with relaxing and confidence-building tea and lunch breaks in-between. Since the questions were discussed chronologically and instantly recorded on a white-paper board, the participants also had a good overview. While certain non-related urban farming issues and concerns were also brought up during the FGD, the research topics remained the focus throughout. Furthermore, the participants stayed committed to the FGD objective, which showed their interest in the topic and indicates the relevance of the topics discussed.

The responses of all the groups were protocolled on paper and audio recorded for the development of the mind map. The aforementioned researchers were responsible for writing each discussion outcome on the white-paper board and confirming its accuracy with the discussants. This support helped to resolve the issue of illiteracy among the participants. A substantial number of the participants in the FGD were quite proactive and the discussions were constructive, concise, and cordial.

2.4. Mind Mapping of FGD Outcomes

The FGD process and procedure provide a good basis for developing a qualitative visual diagram—a mind map of the issues and concerns, as well as the quantitative outcome [11]. On the one hand, this approach simplifies the illustration of the challenges, opportunities, and prospects associated with urban farming innovation from a practitioner and civil servant perspective. On the other hand, it provides a baseline for more complex and comprehensive future research. The mind map is depicted in Figure 1. The complexity and extent of the mind map implies that a concise overview of the challenges, opportunities, and prospects associated with urban farming innovation is cumbersome without further analysis. Therefore, a simplified consensus index is estimated and explained in detail in Section 4. However, the mind map provides some relevant initial insights.



Notes: Subject Matter ■ Civil Servant Perspective ■ Practitioner Perspective ■ Prospects ■

Figure 1. Mind map developed as an outcome of the FGD in Lagos, Nigeria.

The progression of urban farming in SSA, as viewed through the lenses of both the private and public sectors, necessitates a shift towards more innovative and sustainable production methods. Embracing technologies like aquaponics, hydroponics, RAS, drip irrigation, sack farming, and snail farming is widely recognized as essential for fostering innovation and circularity in food production systems. The mind map (Figure 1), derived from the FGD, illustrates these technologies as promising avenues or opportunities for future urban food systems. However, challenges, such as limited land and financial resources, inadequate extension services, and a lack of dialogue between policymakers and practitioners, pose obstacles to the transformation of urban farming for improved FNS and sustainable livelihoods in SSA. The local public agricultural unit in Lagos, Nigeria, predominantly adopts a top-down approach when formulating urban farming policies and engaging with organized farmer unions to instigate transformative changes. Yet, there exists only a moderate comprehension within the public sector regarding the technologies pivotal for driving the desired transformation in urban farming, despite considerable outreach efforts. Furthermore, the public sector allocates limited funding to innovative urban farming interventions or programs, and political affiliations often influence the selection of beneficiaries. Consequently, interventions tend to target a subset of the urban farming population, typically educated and high-value individuals.

The urban farming practitioners in the FGD see themselves not just as participants in the urban food system, but as pivotal contributors. They view themselves as pioneers, embracing innovative techniques, such as aquaponics, hydroponics, RAS, drip irrigation, sack farming, and snail farming, despite the initial financial hurdles. Urban farming practitioners believe that adopting these modern methods can lead to increased productivity. However, they also acknowledge the persistent challenges hindering the attainment of FNS. Challenges, such as limited access to credit, the inadequate supply of quality inputs, deficient extension services, and a lack of supportive programs, particularly from local public agricultural authorities, pose significant barriers. In response to these challenges, urban farming practitioners have expressed a growing preference for interventions and initiatives led by the private sector. They have greater confidence in these private sector initiatives, pointing to the presence of robust monitoring and evaluation mechanisms and the involvement of genuine agents of change. This trust in private sector involvement

stems from their perception that private initiatives are more responsive to their needs and are better equipped to address the complexities of urban agriculture in Lagos.

2.5. Consensus Index

Based on the identified issues and concerns, a simple consensus index was developed, similar to the approach of Kraaijvanger et al. [11]. This consensus index was based on the frequency of a particular issue and concerns raised by the discussants, divided by the total number of issues and concerns raised during the FGD workshop. The consensus index (CI) can be mathematically written as:

$$CI = \sum \frac{Q_i}{c} \quad (1)$$

where Q is the total frequency of a particular issue and concerns i and c are the total number of issues and concerns raised during the FGD. This gives a clearer and more concise interpretation of the FGD process.

3. Results

The CIs from the FGD transcription are depicted in Table 2. The individual CIs provide a good starting point for understanding the major issues and concerns surrounding urban farming innovations from diverse perspectives. Based on the CI calculation, the most important issues and concerns raised by the practitioners and civil servants are presented in Table 2 below. A total of 19 issues and concerns related to the challenges to, and opportunities and prospects of innovation in urban farming were estimated after undertaking an audio-to-word transcription to obtain adequate data.

Table 2. Frequency of issues and concerns during FGD resulting in a CI estimation.

Challenges	Urban Farming Practitioners		Opportunities	N	CI	Challenges	Local Public Servants		Opportunities	N	CI
	N	CI					N	CI			
High cost.	1	0.05	Efficient and time-saving technology.	2	0.11	Practitioners are resistant to change.	3	0.16	Farming for the educated.	1	0.05
Public sector negligence.	11	0.58	High awareness—early adopters.	1	0.05	Misuse of interventions by practitioners.	2	0.11	Occasional intervention and training.	5	0.26
Limited access to technology and innovations, such as aquaponics, etc., provided by public institutions.	3	0.16	Improved productivity and healthy diet.	2	0.11	Moderate awareness of technology and innovations, such as aquaponics, etc.	1	0.05	Wide outreach via social and e-media, collaboration with civil society.	3	0.16
Limited access to public funds and private credit	1	0.05	Efficiency of private sector-driven interventions.	5	0.26	Non-registration of farmers in available local government database.	4	0.21			
Lack of practicality, quality products, and follow-up from public interventions.	13	0.68									
Lack of farmers' cooperation.	12	0.63									
Limited public extension services and training.	5	0.26									
Limited value chain and market integration.	1	0.05									

Note: N = frequency. A total of 19 issues and concerns were raised.

The assessment of these 19 issues and concerns reveals varying degrees of severity, from both the practitioners' and civil servants' perspectives, as depicted in Figure 2. The urban farmers emphasized several key challenges impeding the advancement of innovative urban farming. They underscored the deficiency in practicality, the inadequacy of quality products, and the lack of follow-up from public interventions as notable hurdles. Moreover, they identified a dearth of cooperation and collaboration among themselves as a significant barrier to progress within innovative urban farming. Lastly, the urban farmers lamented the neglect of their needs and concerns by the public sector, recognizing it as yet another formidable obstacle to the transformative potential of urban farming. Nevertheless, urban farmers are increasingly turning to innovative farming practices as a gateway to unlock the benefits of more streamlined and effective private sector interventions. They perceive this shift as a pivotal opportunity to not only boost food production productivity, but to also facilitate greater access to nutritious diets. Additionally, they see innovative farming as a pathway to harness time-saving technologies that could optimize food system processes and enhance overall efficiency.

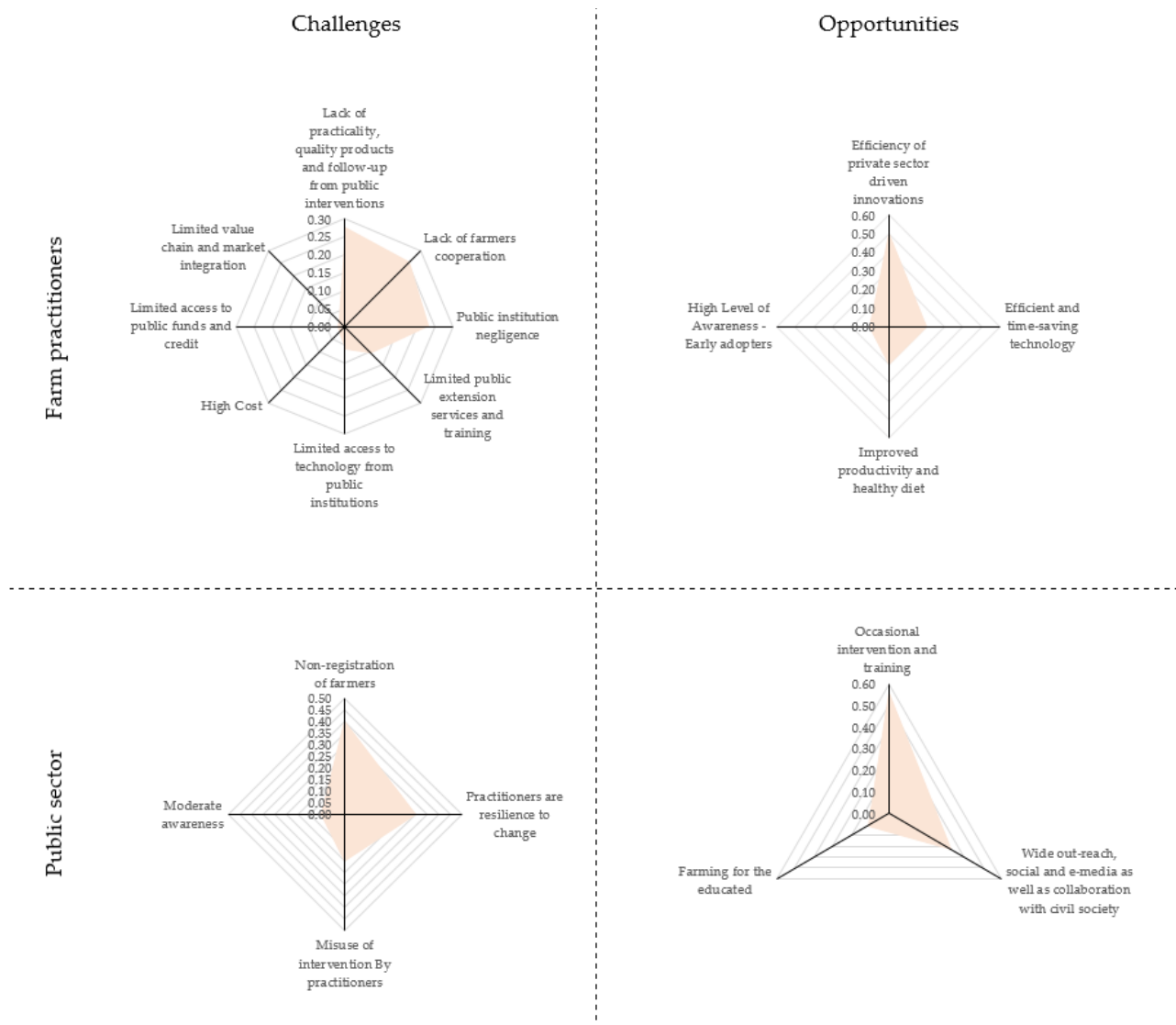


Figure 2. Radial diagrams illustrating challenges to and opportunities of urban farming from practitioner and local public agriculture institution perspectives.

From the perspective of the public sector, urban farmers' lack of cooperation and resistance to change represent substantial obstacles to the advancement of innovative

farming practices. The public sector perceives cooperation among urban farmers as essential for collective progress and the successful implementation of new methods. Without a collaborative approach, the public sector believes that the potential benefits of innovative farming practices may be hindered or delayed. Moreover, the public sector identifies urban farmers' resistance to change as a significant challenge. This perceived resistance (which might be rational from the side of the farmers, due to being left alone with the risk associated with innovations) can manifest in various forms, such as a reluctance to adopt new techniques or technologies, skepticism towards unfamiliar approaches, or adherence to traditional farming methods. Such resistance impedes the integration of innovative practices into urban farming systems and slows down the pace of sustainable development. Furthermore, the public sector highlights the insufficient utilization of programs and interventions by urban farmers as another major obstacle. Despite the modest public programs and interventions aimed at promoting innovative farming practices, urban farmers may not fully engage with these programs due to various reasons, such as a lack of awareness, access barriers, or perceived ineffectiveness. This underutilization of programs and interventions limits the potential impact of public sector efforts to foster innovation and sustainability in urban agriculture.

From the perspective of the public sector, there are two worthwhile opportunities associated with innovative farming practices. These opportunities primarily stem from the modest interventions and training initiatives that the public sector provides. These interventions may include various support mechanisms, such as capacity building, technical assistance, and financial incentives aimed at reducing the risk associated with the adoption of innovative farming methods among urban farmers. Collaboration with the private sector is another opportunity for advancing innovative farming practices. By partnering with private enterprises, governments could leverage resources, expertise, and technology to enhance the effectiveness and scalability of initiatives. Such collaborations could facilitate knowledge exchange, investment opportunities, and the development of innovative solutions to address the challenges facing urban agriculture.

3.1. Challenges to and Opportunities of Urban Farming Innovations—Practitioner Perspective

The urban farm practitioners identified public sector agencies and their corresponding interventions as a significant challenge in the context of urban farming innovations. The practitioners perceived the public sector approach to implementing innovative solutions to be obsolete and slow, which hinders progress in urban farming (Table 3). They also acknowledged their own shortcomings, highlighting issues related to a lack of unity and cooperation among urban farmers. They realized that this behavior could impede the success of public initiatives in promoting urban farming. The practitioners also stated that they perceived the private rather than the public sector as the genuine driver of innovation in urban farming. They have more trust in private sector organization and their ability to provide tailored, high-quality solutions. They believe public institutions do not have the capacity to accelerate innovation in urban farming in the short- or long-term. The practitioners also believe that innovation in urban farming could significantly boost productivity, leading to increased yields and a more efficient use of resources. They also recognize that innovation in urban farming could expand the variety of crops and foods produced, even leading to the renaissance of indigenous African vegetables, resulting in healthier and more diverse diets for urban populations. The practitioners see innovation in urban farming as a means of optimizing scarce resource use, potentially reducing waste, improving environmental sustainability, as well as saving time and freeing up labor for other activities, making urban farming more practical and manageable.

Table 3. Concerns and issues related to innovative urban farming as perceived by practitioners and local public servants.

Challenges	Opportunities	Concerns	Issues	Practitioners	Public Servants
Public institution	-	Neglect of practitioners by public institutions.	Limited programs at the local level; unwelcoming attitude by local authorities, leading to negative interactions and experiences.	×	-
Public interventions	-	Insincerity regarding innovations.	Lack of practicality and knowledge transfer about innovation; the quality of products distributed is poor; there is no follow-up by the public sector; interventions are highly politicized.	×	-
Practitioner attitude	-	Limited unity and distrust among practitioners.	Inability to form a cooperative group or cluster; mistrust of members regarding fund management; lack of patience for long-term projects.	×	-
-	Private institutions	Efficient innovation provider.	Ability to provide practical solutions and knowledge transfer; high quality of products; follow-up approach is prioritized.	×	-
-	Food and nutritional security	Improved productivity and diverse healthy diet.	Urban agricultural innovation has the potential to increase production and diversification of food products.	×	-
-	Modern and state-of-the-art technology	Efficient and time-saving technology.	The use of innovation ensures that production is not obsolete; shortens the duration of production activities, freeing up labor.	×	-
Database	-	Low willingness of urban farming practitioners to register.	Only a few practitioners come to the local public agriculture institution to register; registration is simple and straightforward.	-	×
Practitioners attitude	-	Practitioners seem not to embrace change.	The concept of change is not shared by a large number of practitioners.	-	×
Commitment to programs	-	Practitioners often abuse the purpose of the intervention.	Certain practitioners were observed to have sold products distributed to them during interventions.	-	×
-	Interventions and trainings	Training and skill acquisition programs.	There are programs sponsored by the state and federal government, and sometimes conducted at the local government level; these programs are not regularly conducted.	-	×
-	Outreach and collaboration	Information on innovation is made widely available to practitioners.	Information is spread through diverse channels, including e-media; the collaboration with civil society organizations ensures the dissemination of information.	-	×
-	New urban farming practitioners	Exclusive urban farming approach.	Educated and sophisticated individuals in urban areas are able to comprehend innovation.	-	×

3.2. Challenges to and Opportunities of Urban Farming Innovations—Civil Servant Perspective

The public sector employees i.e., civil servants involved in agriculture predominantly viewed urban farmers' attitudes as a factor that hinders the widespread adoption of innovations in urban farming (Table 3). They expressed concerns regarding the behavior and resistance of urban farming practitioners to change. In their evaluation of urban farmers, public sector employees disregarded the possibility that 'resistant' farmers have individually rational reasons, associated with risk, to delay the adoption of innovations.

Furthermore, public sector employees perceived the lack of data on urban farmers and their refusal to register as a farming entity with the agricultural unit of the local government as a major challenge. They claimed that the lack of data makes it difficult for the public sector to reach out to urban farming practitioners when innovation interventions and programs become available from state or federal institutions. Local public sector employees also expressed doubts about the sincerity of the practitioners participating in urban farming innovation programs. Thus, they are uncertain whether they truly reach practitioners engaged in urban farming or individuals claiming to be engaged in urban farming, but just seeking unearned subsidies.

The local public sector employees consider their knowledge and, subsequently, their interventions and training in innovative urban farming as somewhat in its infancy. Therefore, they perceive their collaboration with the private agri-food system as a way of expanding their knowledge base on innovative urban farming. The public sector employees perceive the few initiatives they have undertaken as a positive driver of urban farming innovation, as they see themselves as an outreach channel for spreading innovative urban farming technologies and techniques among practitioners. However, they perceive urban farming interventions and programs to be more beneficial to educated urban farmers. This reflects their belief that educated individuals can bring valuable expertise to innovation in urban farming.

4. Discussion

Innovations in urban farming, such as aquaponics, hydroponics, RAS, sack farming, drip irrigation, animal husbandry, and waste upcycling could play a major role in urban food systems in the long-term, as the rate of urbanization continues to soar in SSA. While urban farming practitioners will be the drivers of change through the adoption of these innovations, public sector policies and extension services will be catalytic for such change [3]. Unfortunately, synergies have not been witnessed between practitioners and local public agriculture institutions across cities in SSA [3,43]. There seems to be a lack of communication, understanding and, to a large extent, a lack of trust among the relevant urban farming stakeholders when it comes to deploying innovations. To bridge the dialogue gap between urban farming practitioners and public servants on agri-food system transformation through innovation, a FGD was conducted in Alimosho Local Government Areas, Lagos, Nigeria, by the NGO Aglobe Development Center. Gore [43] argued that such NGOs and stakeholder collaboration based on common values supplement government efforts achieving the desired goal, such as innovative urban farming systems.

The FGD workshop was attended by 26 urban farmers and two civil servants from the agricultural unit of the local government. Not surprisingly, the outcome of the FGD points to a divergence in the understanding of the challenges, opportunities and prospects of innovation in urban farming. From the mind-maps and *CI* estimations, the practitioners appear to have a deep understanding of the opportunities associated with innovative urban farming technologies, such as higher productivity and efficiency in relation to inputs such as land, water, or labor. This aligns with the findings of Dubbeling and Merzthal [19], namely that innovation in urban farming is a rather bottom-up approach, and as such, should adopt a participatory dialogue involving an array of stakeholders. The identified lack of trust in public sector interventions among practitioners is one of the major challenges to innovation in urban farming, according to the mind-maps and *CI* estimations. Gore [43] and Quon [44] found that in SSA, representatives of the public sector often do not actively participate in the interaction between urban farmers and other relevant stakeholders, which could explain the distrust. Prain [18] argued that urban farming will only be successful in developing countries if made an integral part of urban development strategy by governments. McIvor and Hale [37] argued that the success of urban farming projects requires a team effort from several actors. The aforementioned lack of trust may have created a void in the pursuit of innovative urban farming, which is increasingly being filled by NGOs, private sector organizations, and advocacy groups across SSA. Urban farming practitioners in Lagos

perceive NGOs and private sector organizations that lead innovations in urban farming as pragmatic, valuable, and authentic. According to Battersby [12] and Smit et al. [33], this may be due to the fact that NGOs and private sector organizations often conduct urban agriculture research and propagate their results in roadshows, adopting an advocacy approach that is apolitical and ahistorical. This makes them the preferred choice of reference for urban farming practitioners in SSA. Urban farming practitioners also see their lack of cooperation and coordination as a hindrance to the adoption of innovative urban farming solutions. This view is also shared by local public servants.

The public sector representatives believe that none of their actions obstruct the adoption of innovative urban farming, rather than seeing themselves as agents of change. They believe that their contribution, although marginal, cannot be downplayed. For instance, they emphasized that their programs and interventions ensure that educated and privileged urban farming practitioners are also represented. One reason for this perspective may be due to the observation by Amao [13] that highly educated urban farming practitioners produce more output and were early adopters compared to less educated and vulnerable practitioners. The Alimosho Local Government Area civil servants believe that their awareness campaigns on innovation in urban farming have reached a substantial number of urban farmers. Benjamin et al. [45] argued that the spread of information about food system innovations through public extension services is rather poor compared to private extension services. This was also reaffirmed during the FGD by urban farming practitioners, who felt that that public extension services were not only lacking but often obsolete.

4.1. Policy Implications

The implications drawn from this study's findings resonate deeply within the realm of urban food policy formulation. They shed light on a significant gap between policy-makers and urban farming practitioners, which is primarily rooted in distrust and a lack of meaningful dialogue. As a result, there has emerged an urgent imperative to engage a broad spectrum of stakeholders, with a particular emphasis on integrating urban farming practitioners into the process of designing urban farming programs and shaping policy frameworks. This inclusive approach is crucial for ensuring the efficacy and success of these initiatives, as highlighted by previous works [44].

The significance of fostering dialogue becomes even more apparent when examining the outcomes of the FGD conducted as part of this study. Through this forum, the challenges stemming from the disconnect and lack of trust between policymakers and practitioners are brought to the forefront, offering valuable insights into the complexities of their relationship dynamics. For example, understanding that practitioners place value on qualities such as practicality, efficiency, and the genuine concern of policymakers presents a promising foundation upon which collaborative efforts could be built. This insight suggests that policymakers must proactively address the inherent constraints on the path of practitioners, including issues related to lack of cohesion.

To tackle these challenges effectively, policymakers may consider adopting strategies aimed at bridging the gap and fostering stronger ties with urban farming practitioners. One such strategy could involve forging stronger partnerships with civil society organizations, leveraging their established networks and credibility to not only broaden outreach efforts but also to capitalize on the trust they have cultivated among urban farming practitioners. By embracing these collaborative approaches and actively addressing the underlying issues that hinder effective engagement, policymakers could pave the way for more inclusive and impactful urban food policies, programs, and interventions in Sub-Saharan Africa.

4.2. Limitations of This Study

One of the limitations of this study is the lack of state or federal representation and perspectives on innovation in urban farming, considering that they often orchestrate programs and interventions that are then implemented at the local government level. Future research should endeavor to incorporate the perspectives of the state or federal

government on innovation in urban farming, as well as conduct a critical assessment of food policy formulation in cities. Furthermore, there is a need for an impact assessment of participation in international collaborative efforts, such as the Milan Urban Food Policy Pact (MUFPP), which promotes best practices in sustainable urban farming policy for African cities, e.g., Lagos, that are not yet signatories.

5. Conclusions

As the pace of urbanization continues to soar in SSA, there is a need to focus on innovation in urban farming for FNS and improved livelihoods, as well as environmental sustainability. Innovation in urban farming in SSA is multifaceted in its challenges, opportunities, and prospects. Addressing the challenges while leveraging the opportunities could help create a sustainable and resilient urban food system in the short- and long-terms only if the relevant stakeholders have a participatory bottom-up dialogue. However, such a participatory bottom-up dialogue is often lacking due to distrust among the relevant stakeholders.

A FGD workshop was conducted in Lagos, Nigeria, bringing together urban farming practitioners and local public sector employees, i.e., civil servants from the agricultural unit. The results suggest that distrust does exist between urban farming practitioners and local public sector employees, with the former having a preference for private sector interventions and programs. The local public sector seems to favor educated and sophisticated urban farmers when it comes to interventions and programs indicating a selection bias.

To drive innovation in urban farming that requires limited resources (land and water) in African cities, such as Lagos, Nigeria, there is a need to align the objectives of urban farming practitioners and the relevant local public sector units. For instance, urban farming clusters could be established with a central database that is accessible to the public sector. This would ensure that public interventions and programs reach the targeted audience at the appropriate time, as well as simplify follow-up measures.

Author Contributions: Conceptualization, E.O.B., A.A. and G.R.B.; methodology, E.O.B. and A.A.; software, E.O.B. and A.A.; validation, E.O.B.; formal analysis, E.O.B., A.A. and G.R.B.; investigation, E.O.B., A.A. and G.R.B.; resources, E.O.B. and A.A.; data curation, E.O.B. and A.A.; writing—original draft preparation, E.O.B. and A.A.; writing—review and editing, G.R.B.; visualization, E.O.B. and G.R.B.; supervision, G.R.B.; project administration, G.R.B.; funding acquisition, E.O.B. and G.R.B. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the European Union under Horizon Europe, grant agreement No. 101083790, project name “Integrated and Circular Technologies for Sustainable city region FOOD Systems in Africa” (INCiTIS-FOOD). The views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.

Data Availability Statement: The research data are archived on a secure private depository and can be shared upon request.

Acknowledgments: We would like to thank the management team (www.aglobedc.org, accessed on 3 June 2024) and staff of Aglobe Development Center, Lagos, Nigeria, especially Dare Balogun, Sulaimon Babalola, Victoria Aghaji, and Hikimot Babalola for their administrative and technical support.

Conflicts of Interest: The authors declare no conflicts of interest. Aglobe Development Center also declares no conflicts of interest.

References

1. Mkwambisi, D.D.; Fraser, E.D.; Dougill, A.J. Urban agriculture and poverty reduction: Evaluating how food production in cities contributes to food security, employment and income in Malawi. *J. Int. Dev.* **2011**, *23*, 181–203. [\[CrossRef\]](#)
2. Sangwan, N.; Tasciotti, L. Losing the plot: The impact of urban agriculture on household food expenditure and dietary diversity in sub-Saharan African countries. *Agriculture* **2023**, *13*, 284. [\[CrossRef\]](#)
3. Davies, J.; Hannah, C.; Guido, Z.; Zimmer, A.; McCann, L.; Battersby, J.; Evans, T. Barriers to urban agriculture in Sub-Saharan Africa. *Food Policy* **2021**, *103*, 101999. [\[CrossRef\]](#)

4. Aliyu, A.A.; Amadu, L. Urbanization, cities, and health: The challenges to Nigeria—A review. *Ann. Afr. Med.* **2017**, *16*, 149–158. [CrossRef]
5. World Population Review. 2023. Available online: <https://worldpopulationreview.com/> (accessed on 25 May 2024).
6. GHIndex 2023. The Power of Youth in Shaping Food Systems. Available online: <https://reliefweb.int/report/world/2023-global-hunger-index-power-youth-shaping-food-systems> (accessed on 23 April 2024).
7. Oteri, A.U.; Ayeni, R.A. The Lagos Megacity. In *Water, Megacities, and Global Change*; 2016; pp. 1–36. Available online: https://www.researchgate.net/publication/313376479_Water_Megacities_and_Global_Change_Portraits_of_15_Emblematic_Cities_of_the_World (accessed on 13 April 2024).
8. Olumba, C.C.; Olumba, C.N.; Alimba, J.O. Constraints to urban agriculture in southeast Nigeria. *Humanit. Soc. Sci. Commun.* **2021**, *8*, 329. [CrossRef]
9. Akinlade, R.J.; Balogun, O.L.; Obisesan, A.A. Commercialization of urban farming: The case of vegetable farmers in southwest Nigeria. In Proceedings of the 2013 Fourth International Conference, Hammamet, Tunisia, 22–25 September 2013.
10. Lawal, M.O.; Aliu, I.R. Operational pattern and contribution of urban farming in an emerging megacity: Evidence from Lagos, Nigeria. *Bulletin of Geography. Socio-Econ. Ser.* **2012**, *17*, 87–97. [CrossRef]
11. Kraaijvanger, R.; Veldkamp, T.; Conny Almekinders, C. Considering change: Evaluating four years of participatory experimentation with farmers in Tigray (Ethiopia) highlighting both functional and human–social aspects. *Agric. Syst.* **2016**, *147*, 38–50. [CrossRef]
12. Battersby, J. Hungry cities: A critical review of urban food security research in sub-Saharan African cities. *Geogr. Compass* **2013**, *7*, 452–463. [CrossRef]
13. Amao, I. Urban Horticulture in Sub-Saharan Africa. In *Urban Horticulture—Necessity of the Future*; IntechOpen: London, UK, 2020. [CrossRef]
14. Sakho-Jimbira, S.; Hathie, I. The future of agriculture in Sub-Saharan Africa. *Policy Brief* **2020**, *2*, 18.
15. Bedeke, S.B. Climate change vulnerability and adaptation of crop producers in sub-Saharan Africa: A review on concepts, approaches and methods. *Environ. Dev. Sustain.* **2023**, *25*, 1017–1051. [CrossRef]
16. Shiferaw, B.; Tesfaye, K.; Kassie, M.; Abate, T.; Prasanna, B.M.; Menkir, A. Managing vulnerability to drought and enhancing livelihood resilience in sub-Saharan Africa: Technological, institutional and policy options. *Weather. Clim. Extrem.* **2014**, *3*, 67–79. [CrossRef]
17. Zougmore, R.B.; Partey, S.T.; Ouédraogo, M.; Torquebiau, E.; Campbell, B.M. Facing climate variability in sub-Saharan Africa: Analysis of climate-smart agriculture opportunities to manage climate-related risks. *Cah. Agric.* **2018**, *27*, 34001. [CrossRef]
18. Prain, G. Participatory technology development for sustainable intensification of urban agriculture. In *Cities Farming for the Future: Urban Agriculture for Green and Productive Cities*; RUAF Foundation, IIRR, IDRC: Ottawa, Canada, 2006; pp. 275–313.
19. Dubbeling, M.; Merzthal, G. Sustaining urban agriculture requires the involvement of multiple stakeholders. In *Cities Farming for the Future: Urban Agriculture for Green and Productive Cities*; RUAF Foundation, IIR, IDRC: Ottawa, Canada, 2006; pp. 19–40.
20. Engel, E.; Fiege, K.; Kühn, A. *Farming in Cities: Potentials and Challenges of Urban Agriculture in Maputo and Cape Town*; Humboldt-Universität zu Berlin: Berlin, Germany, 2019.
21. Benjamin, E.O.; Tzemi, D.; Fialho, D.E. Prospects of Sustainable Urban Framing for Food Security and Sustainable Development in Sub-Saharan Africa. In *Desertification, Land Degradation and Drought Resilience*; Chinweze, C., Ed.; Cuvillier Verlag: Goettingen, Germany, 2023.
22. Benjamin, E.O. Financial Institutions and Trends in Sustainable Agriculture: Synergy in Rural Sub-Saharan Africa. Ph.D. Dissertation, Bergische University Wuppertal, Wuppertal, Germany, 2015.
23. Kimengsi, J.N.; Balgah, R.A.; Buchenrieder, G.; Silberberger, M.; Batosor, H.P. An empirical analysis of credit-financed agribusiness investments and income poverty dynamics of rural women in Cameroon. *Community Dev. J.* **2020**, *51*, 72–89. [CrossRef]
24. Cabannes, Y. Financing urban agriculture. *Environ. Urban.* **2012**, *24*, 665–683. [CrossRef]
25. Orsini, F.; Kahane, R.; Nono-Womdim, R.; Gianquinto, G. Urban agriculture in the developing world: A review. *Agron. Sustain. Dev.* **2013**, *33*, 695–720. [CrossRef]
26. Yoon, B.K.; Tae, H.; Jackman, J.A.; Guha, S.; Kagan, C.R.; Margenot, A.J.; Rowland, D.L.; Weiss, P.S.; Cho, N.J. Entrepreneurial talent building for 21st century agricultural innovation. *ACS Nano* **2021**, *15*, 10748–10758. [CrossRef] [PubMed]
27. Benjamin, E.O.; Buchenrieder, G.R.; Sauer, J. Economics of small-scale aquaponics system in West Africa: A SANFU case study. *Aquac. Econ. Manag.* **2021**, *25*, 53–69. [CrossRef]
28. Davies, F.T.; Garrett, B. Technology for sustainable urban food ecosystems in the developing world: Strengthening the nexus of food–water–energy–nutrition. *Front. Sustain. Food Syst.* **2018**, *2*, 84. [CrossRef]
29. Biru, W.; Buchenrieder, G.; Benjamin, E.O. A systematic Literature Review on the Sustainability of Climate Smart and Water Saving Frontier Agricultural Technologies in the Mediterranean Region. In Proceedings of the Economics of the Food System: Transition toward Sustainability, Heilbronn, Germany, 29 February–1 March 2024.
30. Xi, L.; Zhang, M.; Zhang, L.; Lew, T.T.; Lam, Y.M. Novel materials for urban farming. *Adv. Mater.* **2022**, *34*, 2105009. [CrossRef]
31. Ezeomodo, I.; Egbare, R. Eradication of extreme poverty and hunger using urban agriculture as a tool for sustainable livelihood. *Afr. J. Environ. Res.* **2018**, *1*, 78–97.
32. Slater, R.J. Urban agriculture, gender and empowerment: An alternative view. *Dev. S. Afr.* **2001**, *18*, 635–650. [CrossRef]

33. Smit, J.; Bailkey, M.; Van Veenhuizen, R. Urban agriculture and the building of communities. In *Cities Farming for the Future, Urban Agriculture for Green and Productive Cities*; Van Veenhuizen, R., Ed.; RUAF Foundation: Leusden, The Netherlands, 2006; pp. 146–171.
34. Chaminuka, N.; Dube, E.; Kabonga, I.; Mhembwe, S. Enhancing Urban Farming for Sustainable Development through Sustainable Development Goals. In *Sustainable Development Goals for Society*; Nhamo, G., Chikodzi, D., Dube, K., Eds.; Springer International Publishing: Basel, Switzerland, 2021; Volume 2, pp. 63–77.
35. Mougeot, L.J. *Urban Agriculture: Definition, Presence, Potentials and Risks, and Policy Challenges*; Cities Feeding People Series; IDRC: Ottawa, ON, Canada, 2000; Report 31.
36. König, B.; Janker, J.; Reinhardt, T.; Villarroel, M.; Junge, R. Analysis of aquaponics as an emerging technological innovation system. *J. Clean. Prod.* **2018**, *180*, 232–243. [[CrossRef](#)]
37. Mclvor, D.W.; Hale, J. Urban agriculture and the prospects for deep democracy. *Agric. Hum. Values* **2015**, *32*, 727–741. [[CrossRef](#)]
38. Adedeji-Adenola, H.; Adesina, A.; Obon, M.; Onedo, T.; Okafor, G.U.; Longe, M.; Oyawole, M. Knowledge, perception and practice of pharmaceutical waste disposal among the public in Lagos State, Nigeria. *Pan Afr. Med. J.* **2022**, *42*, 106. [[CrossRef](#)] [[PubMed](#)]
39. Kareem, I.; Adekunle, M.; Adedokun, M.; Ibegbulem, C. Marketing analysis of fluted pumpkin (*telfairia occidentalis hook f.*) in Alimosho Local Government Area, Lagos state, Nigeria. *J. Agric. Sci. Environ.* **2022**, *22*, 85–95.
40. Tregear, A.; Kuznesof, S.; Moxey, A. Policy initiatives for regional foods: Some insights from consumer research. *Food Policy* **1998**, *23*, 383–394. [[CrossRef](#)]
41. Krueger, R.A. *Focus Groups. A Practical Guide for Applied Research*, 2nd ed.; Sage Publications: London, UK, 1994; p. 270.
42. Van Eeuwijk, P.; Angehrn, Z. How to... Conduct a Focus Group Discussion (FGD). Methodological Manual. 2017. Available online: https://www.swisstph.ch/fileadmin/user_upload/SwissTPH/Topics/Society_and_Health/Focus_Group_Discussion_Manual_van_Eeuwijk_Angehrn_Swiss_TPH_2017_2.pdf (accessed on 23 April 2024).
43. Gore, C.D. How African cities lead: Urban policy innovation and agriculture in Kampala and Nairobi. *World Dev.* **2018**, *108*, 169–180. [[CrossRef](#)]
44. Quon, S. *Planning for Urban Agriculture: A Review of Tools and Strategies for Urban Planners*; Cities Feeding People Series; IDRC: Ottawa, ON, Canada, 1999; Report 28.
45. Benjamin, E.O.; Ola, O.; Lang, H.; Buchenrieder, G. Public-private cooperation and agricultural development in Sub-Saharan Africa: A review of Nigerian growth enhancement scheme and e-voucher program. *Food Secur.* **2021**, *13*, 129–140. [[CrossRef](#)]

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.