

Journal Of Liaoning Technical University Matural (Science Edition

FOOD JUSTICE AND COMMUNITY DEVELOPMENT IN SOUTHWEST NIGERIA: EXPLORING THE IMPACT OF URBAN AGRICULTURE ON FOOD ACCESS IN MARGINALIZED COMMUNITIES

OLANIPEKUN, Olubunmi Adebola Department of Adult Education and Community Development, Faculty of Education, Ekiti State University, Ado - Ekiti

ADEBO, Damian Kehinde

Department of Adult Education and Community Development, Faculty of Education, Ekiti State University, Ado - Ekiti

AWONIYI, Benjamin Kolawole

Department of Adult and Continuing Education, Faculty of Education, University of Ilesa

AGUN, Paulinah Olusola

Department of Adult and Non Formal Education, Adeyemi Federal University of Education, Ondo, Ondo State

Abstract

This study explores the impact of urban agriculture on food access in marginalized communities in Southwest Nigeria, framed within the broader context of food justice and community development. Urban agriculture, as an emerging strategy, is posited to address food insecurity by improving the availability, accessibility, and affordability of nutritious food in underserved areas. The research examines how urban farming initiatives contribute to food sovereignty and empower local communities by promoting self-sufficiency and reducing dependency on external food systems. The study also assesses the role of urban agriculture in fostering community resilience, social cohesion, and environmental sustainability, thereby contributing to the overall well-being of marginalized populations. Through a combination of qualitative and quantitative methods, including surveys, interviews, and case studies, the research highlights the challenges and opportunities associated with urban agriculture in the region. The findings suggest that while urban agriculture has significant potential to enhance food access and promote food justice, its success is contingent on supportive policies, adequate resources, and active community participation. The study concludes with recommendations for integrating urban agriculture into broader food policy frameworks and community development strategies, emphasizing the need for collaborative efforts among government agencies, non-governmental organizations, and local communities to realize its full potential.

Keywords: Urban Agriculture, Food Justice, Community Development, Food Access, Marginalized Communities

Journal Of Liaoning Technical University Natural Science Edition ISSN No: 1008-0562

Introduction

Food access and security are critical components of community development, as individuals can only contribute effectively to the well-being of their community and participate in developmental activities when they have access to sufficient and nutritious food. Adequate food intake is essential for maintaining physical health, cognitive function, and emotional well-being, all of which are prerequisites for active involvement in societal progress. Without food security, marginalized populations are often trapped in a cycle of poverty and dependency, limiting their ability to engage in productive activities such as education, employment, and community initiatives. The issue of food availability and urban farming in Southwest Nigeria, particularly among disadvantaged groups, remains underexplored in the current body of research. While there is significant global research linking food security, mental health, and socio-economic development (Onyeaka et al., 2024; Aguiar et al., 2022), the impact of urban agriculture on improving food access in Nigeria has been overlooked. This gap is evident in urban areas of Southwest Nigeria, where rapid urbanization exacerbates food insecurity among marginalized populations

Food justice is an essential idea that tackles the inequalities in food availability and the uneven allocation of food resources among various socio-economic and geographic populations. Food justice fundamentally supports the entitlement of every individual to have nutritious, reasonably priced, and culturally suitable food, irrespective of their socio-economic standing. This concept acknowledges that food insecurity is not just a consequence of poverty, but is also intricately linked to factors like as race, gender, and systematic inequality (Onyeaka et al., 2024). Food justice is a significant global problem that connects with sustainable development, public health, and social fairness. The Sustainable Development Goals (SDGs) established by the United Nations, namely Goal 2, which seeks to eradicate hunger, attain food security, and enhance nutrition, emphasise the necessity of a fairer global food system (Chen et al., 2023).

The food justice movement in Nigeria is rapidly gaining traction due to the country's pressing issues with food insecurity, particularly in marginalised areas. Food insecurity is worsened by the nation's intricate socio-political environment, which is marked by economic inequities and geographical inequalities. The rural and urban impoverished communities are more susceptible, since they have restricted availability of nourishing sustenance and have a greater likelihood of experiencing food insecurity. The problem is worsened by the rising urbanisation in Nigeria, which has put pressure on traditional food systems and led to a greater reliance on imported and processed foods, which are typically less nutritious and more costly (FAO et al., 2023).

Community development is crucial in tackling food insecurity, especially in marginalised areas where access to food is frequently restricted by structural obstacles. Efficient community development projects prioritise the empowerment of local communities, improving their ability to generate and distribute food, and promoting the establishment of sustainable food systems. By engaging community members in decision-making processes and advocating for local solutions, these efforts can effectively tackle the underlying causes of food poverty and advance food sovereignty—the entitlement of individuals to choose their own food systems (Aguiar et al., 2022). Community development projects in Nigeria have the capacity to greatly

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

enhance food security, especially in places that lack sufficient government programs. Southwest Nigeria's local communities possess a wealth of agricultural methods with a potential to relieve food insecurity if revived through community development projects. These programs encompass the creation of community gardens, local markets, and cooperatives that empower communities to cultivate and distribute their own food, therefore decreasing dependence on external food supplies and enhancing availability of fresh, nourishing meals (Ejiohuo et al., 2024).

Urban agriculture is being increasingly acknowledged as a feasible approach to enhance food availability in marginalised groups, especially in swiftly urbanising areas such as Southwest Nigeria. Urban agriculture encompasses the practice of growing, preparing, and delivering food in urban settings, making use of locations like rooftops, empty plots of land, and community gardens. This approach not only serves as a means of obtaining fresh fruit, but also has positive effects on the local economy, improves food security, and promotes community involvement (Berry et al., 2015).

Urban agriculture may have a transformational impact in marginalised communities when there is limited access to fresh and inexpensive food. It provides a viable and long-lasting solution to food deserts, which are urban regions characterised by limited access to inexpensive and high-quality fresh food. Additionally, it enables communities to assert authority over their food supply. Furthermore, urban agriculture may function as a medium for education and skills enhancement, offering chances for community members to acquire knowledge about sustainable agricultural techniques and nutrition (Ashby et al., 2016). Urban agriculture in Southwest Nigeria has the potential to make a substantial difference by tackling the interconnected problems of food insecurity and unemployment. This is especially important for marginalised groups such as youth and women, who are typically disproportionately affected by poverty and lack of access to food (Elgar et al., 2021).

Urban agriculture is in line with the greater objective of environmental sustainability since it encourages the local production of food, reduces the carbon emissions linked to food transportation, and improves urban green areas. Urbanisation in Southwest Nigeria has resulted in the depletion of arable land and a greater dependence on imported food. However, urban agriculture is a viable and sustainable alternative to address the issue of food insecurity in this region. By incorporating urban agriculture into community development strategies, policymakers and local leaders have the ability to establish more robust food systems that effectively address the requirements of marginalised populations (Leung et al., 2020).

Problem Statement

The convergence of food availability and urban farming in Southwest Nigeria is a noteworthy but little examined subject in the existing body of research, especially with regards to disadvantaged groups. Although there is extensive research on the relationship between food security, mental health, and socio-economic development worldwide (Onyeaka et al., 2024; Aguiar et al., 2022), there is a lack of focus on the specific impact of urban agriculture on improving food access in Nigeria. The disparity is particularly evident when evaluating the distinct difficulties and possibilities presented by urbanisation in Southwest Nigeria, where the fast expansion of cities has worsened the problem of inadequate access to food among disadvantaged groups.

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

Previous research highlights the significant correlation between food insecurity and mental health, demonstrating the negative impact of insufficient access to food on the emotional and psychological state of individuals, especially in marginalised populations (Ejiohuo et al., 2024; Elgar et al., 2021). However, these studies generally concentrate on the overall consequences of food insecurity without exploring the possibility of urban gardening as a mitigating element. The potential of urban agriculture to enhance food accessibility and promote community resilience has not been adequately explored within the urban environment of Southwest Nigeria.

In addition, although global and African viewpoints on urban agriculture emphasise its advantages in enhancing food security and fostering sustainable urban development (FAO et al., 2023), there is a noticeable absence of localised studies that examine the practical application of these global insights in Southwest Nigeria. The literature lacks sufficient analysis on how urban agricultural programs might be customised to address the distinct requirements of marginalised populations in this area, taking into account the socio-economic and cultural factors at play. Hence, this study aims to address this deficiency by examining the current body of research on food justice, urban agriculture, and community development, specifically exploring how these factors interact to impact food availability in marginalised areas in Southwest Nigeria.

This literature study seeks to examine the impact of urban gardening on promoting food justice and community development in Southwest Nigeria. The study will examine the potential of urban agriculture to enhance food accessibility in marginalised groups, analyse significant obstacles and prospects, and evaluate its influence on community development. The assessment aims to offer valuable insights into optimal approaches and tactics that may be customised to suit the Nigerian environment by combining worldwide and local viewpoints. The evaluation will also provide information to policymakers, community leaders, and practitioners regarding the integration of urban agriculture into food justice and community development projects.

The paper will consist of an introductory section that establishes the background and aims, followed by a theoretical framework on the topics of food justice and urban agriculture. The review will examine both global and African viewpoints on urban agriculture, with a particular emphasis on Southwest Nigeria. The discussion will integrate the findings, while the conclusion will provide a concise summary of important insights and propose recommendations for future study and practice..

Conceptual Framework

Food Justice

Food justice spans a wide range of concepts focused on fairness and long-term viability within food systems. Food justice may be defined as the effort to establish a fair and environmentally-friendly food system that ensures all individuals have the ability to obtain nutritious, reasonably priced, and culturally suitable food (Johnston et al., 2014). The notion incorporates principles of food sovereignty and food security, which are fundamental to comprehending food justice. Food Sovereignty encompasses the entitlement of individuals to choose and control their own food systems, encompassing the entire process from food production to distribution and consumption (James et al., 2021). This idea prioritises decentralisation of food

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

systems, questioning the hegemony of multinational businesses and promoting policies that bolster local farmers and communities. It strongly corresponds to food justice by advocating for fair access to resources and the ability to make decisions within food systems (Banerjee & Hysjulien, 2018).

Food security is the goal of ensuring that every person has reliable access to an adequate, secure, and nourishing food supply in order to sustain a healthy life (Johnston et al., 2014). This idea emphasises the need of tackling structural disparities and obstacles that hinder individuals from obtaining sufficient nourishment. Food justice encompasses food security by tackling the underlying factors that contribute to food insecurity, such as poverty and limited access to resources. It aims to bring about structural reforms that promote a fairer distribution of food. Within the realm of urban agriculture, the ideals of food sovereignty and food security hold significant relevance. Urban agriculture has the potential to promote food sovereignty by enabling communities to cultivate their own food and exert authority over their food provision (Giudice et al., 2020). Additionally, it enhances food security by augmenting the availability of local food and diminishing reliance on foreign food systems. This is particularly significant in marginalised areas where access to nourishing food is frequently restricted (Chen & Antonelli, 2020).

Community Development

Community development comprises a range of theories and strategies that seek to improve the welfare of communities and tackle issues such as food availability. An influential model is the Asset-Based Community Development (ABCD) method. This paradigm emphasises the utilisation of the current assets present in a community, such as local expertise, resources, and networks, to tackle difficulties and promote growth (Jacobi et al., 2020). Regarding food access, the ABCD method may be employed to discover and make use of local agricultural techniques, community gardens, and food-sharing networks in order to enhance food security. The Sustainable Livelihoods Approach (SLA) is another significant paradigm that highlights the crucial role of capital assets (human, social, natural, financial, and physical) in strengthening the resilience and capacities of individuals and communities (Johnston et al., 2014). The SLA model may direct efforts to enhance food access through urban agriculture and community-driven food systems by emphasising the development and utilisation of these resources.

Participatory Development is a significant notion that entails the active engagement of community people in decision-making processes. This paradigm promotes the use of inclusive techniques that include local knowledge and choices into development plans (James et al., 2021). Participatory development in relation to food access guarantees that urban agricultural projects and food justice efforts are in line with the needs and wants of marginalised groups, therefore improving their efficacy and long-term viability.

Community empowerment is crucial for fostering sustainable development and enhancing food accessibility. Empowerment entails bolstering the aptitude of individuals and collectives to make well-informed choices, obtain resources, and exert influence over policies that impact their lives (Banerjee & Hysjulien, 2018). In the realm of food systems, empowerment can result in more efficient urban agriculture practices, as community members possess the necessary skills and knowledge to effectively oversee and maintain these endeavours. Communities that have been given

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

power and authority are more inclined to participate in and endorse local food systems, which can result in enhanced food security and fairness. Communities may customise urban agricultural initiatives to meet specific local food requirements and preferences by actively participating in their design and management (Chen & Antonelli, 2020). This engagement not only enhances the availability of food but also cultivates a feeling of possession and accountability towards sustaining and enlarging these initiatives.

Moreover, community empowerment promotes cooperation among many local entities, such as governmental institutions, non-governmental organisations, and private sector participants (Slater et al., 2020). These relationships are essential for developing supporting policy, obtaining financing, and executing effective food justice programs. Communities that have been given power and authority may actively promote and fight for the needed improvements in local food systems, while also using external assistance to make them even better.

Urban Agriculture

Urban agriculture, the growing of food in urban contexts, offers a significant opportunity for sustainable development and enhanced food security, especially in marginalised populations. Theoretical urban agriculture models frequently highlight its capacity to combine food production with urban planning, resulting in systems that are ecologically sustainable and socially fair. According to Giudice et al. (2020), urban agriculture has the potential to contribute to the circular economy by decreasing food waste and improving local food systems. This strategy is in line with the concepts of sustainability as it reduces the environmental impact of food production and distribution, so promoting both ecological and community well-being.

Furthermore, urban agriculture may be analysed from the perspective of food justice, a concept that aims to tackle structural disparities in food availability. According to James et al. (2021), urban agriculture may be utilised as a means of redistributing food resources and uplifting marginalised populations. Urban agriculture may alleviate the negative impacts of food deserts, which are regions with limited availability of inexpensive and nutritious food, by offering fresh, locally-grown vegetables. Urban agriculture not only promotes food justice but also contributes to community development. According to Johnston et al. (2014), urban agriculture plays a vital role in promoting sustainable diets, which are essential for enhancing health outcomes and ensuring food security. This viewpoint is especially pertinent in marginalised populations where conventional food systems may be insufficient. Urban agriculture improves food accessibility and promotes communal unity by engaging citizens in the process of food production and generating chances for local involvement.

Moreover, including urban agriculture into community development initiatives might enhance the ability to withstand and recover from disturbances in the food system. Ahmed et al. (2020) propose that urban agriculture has the potential to strengthen the resilience of food systems by increasing the variety of food sources and decreasing reliance on external supply chains. The ability to withstand and recover from global difficulties, such as the COVID-19 pandemic, is of utmost importance. This crisis has brought to light the weaknesses in food systems around the globe (Lambrou et al., 2021).

Journal Of Liaoning Technical University Natural Science Edition ISSN No: 1008-0562

Community Engagement in Urban Agriculture

Community involvement in urban agriculture in Southwest Nigeria is limited, despite increasing acknowledgement of its capacity to mitigate food insecurity, increase nutrition, and foster community development. Urban agriculture, characterised as the cultivation, processing, and distribution of food within or near urban locales, remains an underutilised asset in most Nigerian cities. Studies indicate that food systems in Sub-Saharan Africa, particularly in Nigeria, predominantly rely on rural agriculture, with less focus on urban farming (Chivenge et al., 2015). The lack of involvement from urban residents signifies a lost chance to diversify food sources and address the region's food insecurity issues. Although research in several African countries has recorded successful instances of community-driven urban agriculture, this is not the case for cities in Southwest Nigeria, where local efforts have struggled to achieve substantial momentum (Akinola et al., 2020).

A primary obstacle to community involvement in urban agriculture in this area is the belief that farming is mostly a rural endeavour. Urban inhabitants, particularly from middle and high socio-economic strata, frequently perceive agriculture as an endeavour suited for rural populations or the economically marginalised, so establishing a cultural divide between urban existence and agricultural engagement (Johnston et al., 2014). Consequently, prospective urban agriculture efforts in Southwest Nigeria have faced challenges in garnering enduring community interest and participation. This hesitance has been exacerbated by socio-economic difficulties, such as land ownership disputes, limited resource access, and inadequate state assistance (Ahmed et al., 2020). In the absence of requisite infrastructure and governmental support, urban people remain disconnected from agricultural methods that may yield significant advantages, such as increased food security and higher mental and physical well-being.

The deficiency of community involvement in urban agriculture is worsened by a pervasive ignorance regarding the health and economic advantages of local food cultivation. Research indicates that urban agriculture enhances food security, mitigates food deserts, and promotes economic resilience by supplying inexpensive, nutritious food (Elgar et al., 2021). In Southwest Nigeria, most urban residents lack sufficient awareness of these advantages, and local governments or civil society have made few efforts to advocate for urban farming as a feasible remedy for urban food insecurity (James et al., 2021). As a result, urban inhabitants remain significantly dependent on food sourced from rural regions or international markets, thereby heightening their susceptibility to interruptions in food supply, as seen during the COVID-19 pandemic (Ahmed et al., 2020).

The socio-cultural milieu of Southwest Nigeria significantly influences the restricted community involvement in urban agriculture. The belief that urban farming is neither contemporary nor progressive deters involvement, particularly among the youth and affluent demographics. Urban inhabitants tend to prioritise other job opportunities, resulting in the significant neglect of agriculture (El Bilali, 2019). This cultural mindset, coupled with insufficient information regarding the possibilities of urban farming, further alienates community people from the concept of converting their urban environments into productive agricultural areas. Conversely, in certain areas, urban agriculture has been adopted as a means for both food production and fostering social cohesion and community development (Jacobi et al., 2020).

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

Moreover, urban agriculture necessitates cooperation among several stakeholders, including municipal authorities, non-profit organisations, and private sector collaborators, to furnish the resources and infrastructure essential for sustained community involvement. In Southwest Nigeria, there is a deficiency in multi-stakeholder engagement, resulting in fragmented or poorly planned urban agriculture initiatives (Apostolidis et al., 2021). The lack of comprehensive policy frameworks to support urban farming projects has resulted in a fragmented approach, characterised by individual activities devoid of community-wide engagement. This has further impeded the expansion of urban agriculture and its incorporation into conventional urban development strategies.

The minimal involvement of communities in urban agriculture in Southwest Nigeria highlights the necessity for a transformation in policy and cultural perspectives. Although urban farming might alleviate food poverty, enhance public health, and promote sustainable urban ecosystems, local residents typically remain uninvolved owing to socio-economic, cultural, and infrastructural obstacles. In the absence of a coordinated initiative to enhance awareness, increase resource accessibility, and promote multi-stakeholder engagement, the whole potential of urban agriculture in Southwest Nigeria would remain unfulfilled. Fostering community engagement necessitates specific initiatives that tackle these obstacles and advocate for urban agriculture as a feasible and significant aspect of urban life (Aguiar et al., 2022).

Urban Agriculture and Impact of Food Access

Urban agriculture has become a prominent approach to tackle food insecurity and advance food justice on a global scale. Cities strive to optimise food access, bolster community resilience, and promote sustainable development by incorporating food production into urban environments. The advantages of urban agriculture have been proven in several worldwide settings. Urban farming has been utilised in locations such as Detroit in North America to address the issue of food deserts and rejuvenate local communities (FAO et al., 2023). Detroit's urban farms not only offer fresh fruit, but also function as community centres, bolstering local food security and promoting social togetherness (James et al., 2021). In Europe, cities such as Berlin and Paris have implemented urban agriculture projects to combat food insecurity. These initiatives involve the establishment of community gardens and the integration of food production into public areas (Garratt, 2020; El Bilali, 2019). These initiatives have effectively enhanced the availability of nutritious food for city dwellers while also advocating for ecological sustainability. Asian cities such as Seoul have included rooftop gardens and vertical farms into their urban design initiatives. These measures aid in reducing the impact of urban heat islands, enhancing air quality, and establishing local food supplies (Chen et al., 2023). Seoul's rooftop garden plan has significantly improved food security by boosting the accessibility of fresh vegetables in highly populated regions.

Research indicates that urban agriculture may greatly enhance the accessibility and cost-effectiveness of food. Urban agriculture in Buenos Aires has resulted in an augmentation in fresh vegetable availability, leading to a decrease in food expenses for low-income households (Leung et al., 2020). Moreover, urban farms frequently hire individuals from the local community, so generating employment prospects and fostering local economies (Elgar et al., 2021). Urban agriculture enhances food security through the diversification of food sources and the reduction of reliance on

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

external supply networks. Urban farms contribute to the reduction of hazards caused by global supply chain disruptions by cultivating food locally, as demonstrated during the COVID-19 pandemic (Giudice et al., 2020). This localised production approach improves the ability of urban food systems to withstand challenges and promotes the long-term viability of communities.

Urban agriculture in Africa is essential for enhancing food accessibility and advancing food equity. Rapid urbanisation in several African cities has resulted in a rise in food insecurity, which has created a need for inventive approaches such as urban farming (Chivenge et al., 2015). This section examines the difficulties and achievements of urban agriculture projects around the continent. Urban agriculture has been adopted by African cities like Nairobi and Accra as a means to address the issue of food insecurity. The city farms in Nairobi have become essential components of the local food chain, supplying urban inhabitants with fresh produce and establishing green areas in predominantly concrete environs (Akinola et al., 2020). Furthermore, community-based farming programs in Accra have enhanced food accessibility for low-income households and bolstered local economies, thereby exemplifying the positive impact of urban agriculture (Ojiewo et al., 2013).

The success of these programs is sometimes credited to the amalgamation of conventional agricultural methods with contemporary innovations. The utilisation of native crops and sustainable agricultural techniques has improved both the availability of food and the nutritional quality in different urban environments (Mbhenyane, 2017; Ayanwale et al., 2016). These techniques not only enhance the availability of food, but also save indigenous agricultural expertise and cultural legacy.

Notwithstanding these achievements, urban agriculture in Africa encounters several obstacles. The expansion and viability of urban farming efforts are impeded by restricted land access, limited infrastructure, and insufficient support from policymakers (Zou et al., 2023). In addition, the absence of technical proficiency and resources hinders urban farmers from adopting effective and scalable agricultural methods (Apostolidis et al., 2021). It is necessary for governments and international organisations to allocate resources, give training, and offer incentives in order to encourage urban agriculture and address current obstacles (Ashby et al., 2016).

The southwestern region of Nigeria, similar to several other areas in Africa, has substantial food security obstacles that are intensified by the fast growth of metropolitan areas and socio-economic inequalities. The implementation and effects of urban agriculture need to be carefully examined in order to handle these concerns effectively. Urban agriculture in Southwest Nigeria is becoming recognised as a viable approach to enhance food security and foster sustainable development. Research has demonstrated that urban farming methods, such as cultivating gardens in residential areas and establishing community farms, lead to more food accessibility and less dependence on external food supplies (Onyeaka et al., 2024). Urban farms in Lagos and Ibadan have effectively supplied fresh produce to local markets and homes, showcasing the capacity of urban agriculture to improve food accessibility in these regions (Ejiohuo et al., 2024).

The capacity of urban agriculture to tackle food insecurity in Southwest Nigeria is substantial. By incorporating food production into urban settings, cities may enhance food accessibility for marginalised people and promote local economic growth (Chen et al., 2023). Urban farms may also function as teaching instruments, fostering

https://www.lgjdxcn.asia/

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

knowledge about sustainable agricultural methods and advocating for more nutritious meals (Berry et al., 2015). Moreover, urban agriculture can contribute to the alleviation of climate change impacts by minimising the distance food travels and decreasing carbon emissions. Urban farming provides a feasible alternative to conventional farming practices in Southwest Nigeria, where agricultural production is influenced by climatic fluctuation (Pawlak, 2016). Implementing climate-smart techniques, such as collecting rainfall and conserving soil, can strengthen the ability of urban food systems to withstand and recover from challenges, while also promoting sustainable development goals (Cadillo-Benalcazar et al., 2020).

Food Justice and Urbanization Trends in Southwest, Nigeria

Throughout the colonial era, agricultural policy mostly focused on extracting resources for export, disregarding local food requirements and resulting in notable discrepancies in food accessibility (FAO et al., 2023). The British colonial administration's prioritisation on commercial crops like as cocoa and oil palm resulted in a reduced emphasis on food crops, leading to imbalances in food security (Onyeaka et al., 2024). Following Nigeria's independence, the country's food system encountered several obstacles, such as fast population expansion and insufficient infrastructure. The Green Revolution had a substantial global influence on agricultural practices, but its effectiveness in Nigeria was hindered by the absence of customised implementation methods and support structures (Chen et al., 2023). The Nigerian Civil War, along with other historical disturbances, had enduring consequences on food production and distribution, intensifying food insecurity in the area.

The presence of socioeconomic inequalities in Southwest Nigeria has significantly impacted the ability of individuals to get food. The region exhibits pronounced disparity, with a considerable segment of the populace residing below the poverty threshold. The economic disparity has a direct effect on food security, since households with lower incomes have obstacles in obtaining an adequate and nourishing diet (Ejiohuo et al., 2024). Disadvantaged groups, especially those living in rural and peri-urban regions, face increased levels of food insecurity as a result of their low financial means and insufficient access to agricultural resources. There is a strong correlation between food insecurity and mental health problems, particularly among persons in lower socioeconomic groups. These individuals experience elevated levels of stress and psychological distress due to limited access to food (Elgar et al., 2021). The significance of this link highlights the need to tackle both socioeconomic inequalities and mental health issues in order to enhance food justice.

The process of urbanisation in Southwest Nigeria has occurred at a fast pace and without proper planning, resulting in considerable difficulties for food systems. Lagos and Ibadan have seen rapid expansion, leading to the proliferation of urban areas and heightened strain on food distribution networks (FAO et al., 2023). The transition from rural to urban regions has transformed conventional farming techniques and established novel trends in food consumption and distribution. Urbanisation usually results in the proliferation of informal settlements and slums, where inhabitants frequently face a dearth of essential amenities, such as access to sustenance. The growing demand for food in urban areas has put pressure on current supply chains and led to an increase in food costs, exacerbating the challenge for low-income urban residents to get adequate nutrition (Zou et al., 2023).

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

Urbanisation has diverse consequences on the accessibility of food. Urban locations have superior access to marketplaces and a wider range of food alternatives in comparison to rural areas. However, the problems caused by urbanisation, such as insufficient infrastructure and expensive food, might worsen the issue of food insecurity among marginalised communities (Leung et al., 2020). Urban agriculture has arisen as a viable answer to these difficulties by offering a method for urban residents to cultivate their own food, thereby enhancing food availability and stability. Urban agriculture in Southwest Nigeria has the capacity to mitigate these problems by augmenting local food production and diminishing dependence on remote supply networks. Nevertheless, the effectiveness of urban agricultural projects is frequently limited by variables such as the availability of land, access to resources, and the presence of supportive legislation (El Bilali, 2019). For urban agriculture to be successful, it needs a favourable environment that provides access to land, water, and markets. Additionally, policies that encourage the integration of urban agriculture into urban planning are necessary (James et al., 2021).

The Role of Urban Agriculture in Mitigating the Negative Impacts of Urbanization on Food Security

The rapid pace of urbanization has created numerous challenges for food security. According to the FAO (2023), urbanization often leads to increased food demand, changes in food consumption patterns, and greater pressure on existing food supply chains. As urban areas expand, they can encroach upon agricultural land, reducing the availability of space for traditional farming and increasing reliance on global food systems. This shift can lead to a range of food security issues, including limited access to fresh and nutritious food, increased food prices, and greater vulnerability to supply chain disruptions (FAO et al., 2023). Urban agriculture offers a potential remedy to these challenges by reintroducing food production into the urban environment. This practice can help alleviate food insecurity by increasing the local availability of fresh produce, reducing food transportation costs, and strengthening community resilience against food systems. Benefits of urban agriculture include

- 1. Improved Food Access: One of the most direct benefits of urban agriculture is its potential to improve food access. Urban farms and community gardens provide local sources of fresh fruits and vegetables, which can be particularly beneficial in food deserts—areas with limited access to affordable and nutritious food (Berry et al., 2015). Studies have shown that urban agriculture can increase the availability of fresh produce in low-income communities, improving overall diet quality and food security (Chen et al., 2023).
- 2. Economic and Social Benefits: Urban agriculture can also generate economic and social benefits. It creates job opportunities, stimulates local economies, and fosters community engagement (Garratt, 2020). Community gardens and urban farms often become focal points for social interaction, education, and skill-building, which can strengthen social cohesion and community resilience (Onyeaka et al., 2024). Additionally, urban agriculture can provide economic benefits by reducing food costs for households and creating local markets for agricultural products (Ashby et al., 2016).

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

3. Environmental Sustainability: Urban agriculture contributes to environmental sustainability by promoting green spaces within cities. It can help mitigate urban heat islands, improve air quality, and enhance biodiversity (Zou et al., 2023). Furthermore, urban farming practices often incorporate waste recycling and water conservation techniques, which can reduce the environmental impact of food production and support more sustainable urban development (Giudice et al., 2020).

In Nigeria, urban agriculture has been gaining attention as a strategy to address food security issues exacerbated by rapid urbanization. Studies have highlighted the potential of urban farming to improve food access and support community development in Nigerian cities (Pawlak, 2016). Urban agriculture initiatives in cities like Lagos and Ibadan have demonstrated positive impacts on local food systems, including increased availability of fresh produce and improved dietary diversity among urban residents (Chen et al., 2023). However, the implementation of urban agriculture in Nigeria faces several challenges. These include limited access to land, inadequate infrastructure, and a lack of supportive policies (El Bilali, 2019). Addressing these challenges requires a multifaceted approach that includes policy support, community involvement, and investment in infrastructure and education (Cadillo-Benalcazar et al., 2020).

Effective policy and institutional support are crucial for the successful implementation of urban agriculture. Policymakers need to create an enabling environment that supports urban farming through incentives, regulations, and infrastructure development (James et al., 2021). This includes providing access to land, funding, and technical assistance, as well as integrating urban agriculture into broader urban planning and food security strategies (Slater et al., 2020). In Nigeria, there is a need for policies that promote urban agriculture as a viable component of the national food system and address the specific challenges faced by urban farmers (Apostolidis et al., 2021).

Urban agriculture plays a vital role in mitigating the negative impacts of urbanization on food security. By increasing the local availability of fresh produce, generating economic and social benefits, and contributing to environmental sustainability, urban agriculture can enhance food access and community resilience in urban areas. In the context of Nigeria, urban agriculture presents a promising strategy to address food security challenges, but its potential can only be fully realized through supportive policies, infrastructure investments, and community engagement.

Urban Agriculture as Opportunities for Community Development

Urban agriculture has arisen as a transformational activity with the ability to tackle several urban problems at the same time. One of the main advantages it provides is the enhancement of food availability in underprivileged regions. Urban agriculture promotes food security by transforming unused areas like as abandoned lots, roofs, and communal spaces into productive gardens, allowing local inhabitants to cultivate their own food (FAO et al., 2023). This is especially vital in marginalised communities where the availability of fresh food is frequently restricted owing to economic restrictions and a scarcity of grocery outlets. Additionally, urban agriculture promotes initiatives. Community gardens and urban farms have the potential to generate jobs and boost local economies by supplying fresh food to nearby markets

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

(Berry et al., 2015). Urban farming programs frequently incorporate farmer's markets and local sales, which actively contribute to the economic rejuvenation and communal resilience.

Urban agriculture also contributes to social cohesiveness, which is a notable advantage. Community gardens and urban farms offer venues for citizens to convene, cooperate, and participate in purposeful endeavours. Engaging in this activity can enhance social connections and cultivate a feeling of inclusion among individuals (James et al., 2021). Moreover, urban agriculture provides educational prospects by instructing people, particularly young individuals, on sustainable methodologies, nutrition, and the significance of local food systems (Slater et al., 2020). The acquisition of information and skills via educational components may greatly enhance the well-being of people and communities. In order to fully use its potential, urban agriculture must overcome certain obstacles that hinder its ability to contribute to food justice and community development. Key challenges include limited access to resources, regulatory constraints, and socio-economic factors. To overcome these barriers, targeted strategies are necessary.

- 1. Resource Accessibility: Access to land, water, and financial resources is a major challenge in urban agriculture. Strategies to overcome this include creating community-based resource sharing models and partnerships with local governments and businesses. For example, city policies can be designed to provide incentives for urban farming, such as tax breaks or grants for the development of community gardens (Zou et al., 2023). Additionally, establishing community land trusts can help secure long-term access to urban plots for agricultural use.
- 2. Regulatory Support: Navigating zoning laws and regulations can be a significant hurdle for urban agriculture. Advocating for policy changes that support urban farming and reduce bureaucratic obstacles is crucial. This includes lobbying for zoning adjustments that permit agricultural activities in urban areas and simplifying the permitting process for urban farms (Cadillo-Benalcazar et al., 2020). Engaging with policymakers and community leaders to create supportive regulatory frameworks can facilitate the growth of urban agriculture.
- 3. Economic Viability: Ensuring the economic sustainability of urban agriculture initiatives requires strategic planning and support. Providing access to microfinancing and training programs for urban farmers can enhance their ability to manage and grow their operations effectively (Akinola et al., 2020). Additionally, developing market linkages between urban farms and local consumers through farmer's markets or subscription-based produce delivery can improve economic outcomes and community support for urban agriculture projects (Apostolidis et al., 2021).
- 4. Community Engagement: Effective community engagement is essential for the success of urban agriculture initiatives. Involving local residents in the planning and implementation of urban agriculture projects ensures that the initiatives meet the specific needs and preferences of the community (Jacobi et al., 2020). Conducting workshops, focus groups, and surveys can help gather input from community members and build a sense of ownership and commitment to the projects.

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

5. Educational Outreach: To foster a culture of sustainability and food justice, educational programs focused on urban agriculture should be promoted. Schools, community centres, and non-profit organizations can offer workshops and training on topics such as organic farming, nutrition, and sustainable practices (Mazac et al., 2021). These programs not only equip individuals with practical skills but also raise awareness about the benefits of urban agriculture and food justice.

Urban agriculture can play a crucial role in mitigating food insecurity. Implementing programs that distribute produce from community gardens to food banks and low-income families can directly address immediate food needs (Chen et al., 2023). Furthermore, incorporating indigenous and underutilised crops into urban agriculture practices can enhance dietary diversity and nutritional outcomes for urban populations (Mbhenyane, 2017). In conclusion, urban agriculture holds significant potential as a catalyst for community development. By improving food access, fostering economic growth, and strengthening social ties, it contributes to the broader goals of food justice and sustainable community development.

Practical Insights to Urban Agriculture in Nigeria and Globally

Urban agriculture has become a potent means of improving food availability in many situations, especially in poor nations where there is a high prevalence of food insecurity. This strategy has been effectively executed in several places, showcasing its capacity to tackle food access problems and advance food justice. An analysis of case studies conducted in Nigeria and other developing nations demonstrates that urban agriculture has the potential to significantly enhance food accessibility. For example, in Lagos, Nigeria, urban farming projects have effectively incorporated vegetable gardens into urban environments, resulting in a rise in local food production and a decrease in reliance on external food sources (Onyeaka et al., 2024). In Nairobi, Kenya, urban agriculture initiatives have employed rooftop gardens and community farms to improve food security and offer fresh produce to city dwellers (Jacobi et al., 2020). These programs have not only enhanced food security, but also fostered environmental sustainability and communal connection.

Urban agriculture has demonstrated comparable achievements in other emerging countries, such as South Asia and Latin America. The implementation of small-scale urban farming initiatives in Dhaka, Bangladesh has facilitated the provision of nourishing food to low-income households, thereby enhancing their overall welfare (Elgar et al., 2021). In Lima, Peru, urban agriculture has enhanced food security by combining ancient agricultural methods with contemporary technology to maximise crop production and resource efficiency (Chivenge et al., 2015). These examples demonstrate how urban agriculture may adjust to various local circumstances and obstacles, providing significant knowledge for its implementation in Southwest Nigeria.

The triumphant urban agriculture initiatives provide several insights and exemplary methods that might be used in Southwest Nigeria. An essential lesson to learn is the significance of community engagement and assistance. Ashby et al. (2016) argue that successful programs frequently include local citizens during the design and implementation stages to ensure that the initiatives align with their needs and preferences. Incorporating traditional agricultural knowledge alongside contemporary practices has been demonstrated to be successful in enhancing output and

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

sustainability (Ojiewo et al., 2013). Another crucial aspect is the requirement for sufficient infrastructure and resources. Projects that offer access to necessary resources, instruction, and economic assistance tend to get more favourable results (Pawlak, 2016). Moreover, the success of urban agricultural efforts may be enhanced by establishing collaborations among local governments, NGOs, and private sector entities, which allows for the consolidation of resources and knowledge (James et al., 2021).

An analysis of urban agricultural programs in different countries reveals the diverse effects on food accessibility and equity. Urban agriculture in industrialised nations, particularly in Europe and North America, largely emphasises community gardens and local food networks. These initiatives aim to improve the quality and sustainability of food production (Cadillo-Benalcazar et al., 2020). These projects often gain advantages from enhanced infrastructure and finance, resulting in elevated levels of success in enhancing food access and advocating for environmental stewardship (Giudice et al., 2020). On the other hand, urban agriculture in poor nations often focusses on addressing pressing issues, such as alleviating food insecurity and enhancing nutritional outcomes for low-income communities (Zou et al., 2023). An emphasis is frequently placed on optimising the use of existing resources and incorporating urban farming into everyday life in order to tackle urgent issues related to food accessibility (Leung et al., 2020). This method highlights the flexibility of urban agriculture in adapting to various socio-economic conditions and its capacity to tackle both immediate and enduring concerns of food security.

By incorporating important findings from the urban agriculture literature, it becomes evident that urban agriculture has a substantial capacity to enhance food justice in Southwest Nigeria. Empirical evidence from successful case studies and comparative analyses highlights the significance of community engagement, infrastructural assistance, and the integration of traditional and contemporary agricultural methods (Onyeaka et al., 2024; Jacobi et al., 2020). Urban agriculture has the potential to improve food security through the augmentation of local food production, diminishing dependence on foreign food sources, and enhancing the accessibility of nourishing foods (Elgar et al., 2021). Furthermore, the versatility of urban agriculture in adapting to various circumstances implies that it may be successfully applied in Southwest Nigeria, where comparable socio-economic situations and food security issues are present (Chivenge et al., 2015). Urban agriculture may be customised to meet local requirements and conditions by studying successful initiatives in other areas and using best practices.

Urban agriculture has wider ramifications for the sustainable development of communities beyond enhancing access to food. Creating shared places for local involvement and cooperation can enhance community cohesiveness (James et al., 2021). In addition, urban farming projects can enhance environmental sustainability by advocating for the creation of green areas and minimising the carbon emissions linked to food transportation (Giudice et al., 2020). Moreover, urban agriculture has the potential to invigorate local economies through the generation of employment possibilities and the bolstering of small-scale enterprises (Apostolidis et al., 2021). By incorporating food production into urban design, communities can attain enhanced self-reliance and resistance to food supply interruptions (Chen et al., 2023). The advantages underscore the capacity of urban agriculture to contribute to holistic and enduring community development in Southwest Nigeria.

https://www.lgjdxcn.asia/

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

Conclusion

Urban agriculture has demonstrated its ability to significantly improve food accessibility and advance the cause of food justice worldwide. By integrating food production into urban environments, cities can effectively tackle the issue of food insecurity, strengthen community resilience, and promote sustainable development. Urban farms have successfully integrated into metropolitan environments on a global scale. Urban gardening has been employed in areas like Detroit in North America and Berlin and Paris in Europe to address the issue of food deserts and rejuvenate neighbourhoods. These urban gardening programs not only offer fresh fruit but also promote communal togetherness and ecological sustainability. Cities in Asia, such as Seoul, have successfully introduced rooftop gardens and vertical farms to address the issue of urban heat islands and improve food security. The efficacy of urban agriculture in enhancing food accessibility and affordability is well-demonstrated by initiatives in Buenos Aires, which have successfully decreased food expenses for economically disadvantaged households and generated employment prospects.

Urban agriculture in Africa has become a vital response to the worsening problem of food insecurity caused by growing urbanisation. Nairobi and Accra have used urban farming to improve food accessibility and bolster local economies, showcasing the effectiveness of blending ancient agricultural methods with contemporary innovations. Nevertheless, obstacles such as restricted land availability and insufficient infrastructure remain, underscoring the necessity for favourable policies and sufficient resources. Urban agriculture in Southwest Nigeria has the potential to enhance food security by boosting local food production and decreasing dependence on distant supply networks. This technique not only tackles urgent food need but also promotes communal advancement by generating employment and providing educational prospects. Implementing urban farming techniques can help alleviate the negative impacts of climate change and support the objectives of sustainable development. Urban agriculture is a viable approach to improve food access and community resilience. It provides useful insights for tackling food security concerns at both local and global levels.

Recommendations

In order to facilitate urban agricultural projects in disadvantaged areas, politicians, community leaders, and non-governmental organisations (NGOs) should take into account a number of suggestions. First and foremost, it is imperative to implement supporting policies that offer financial incentives and technical support for urban farming initiatives. Implementing such rules can effectively address obstacles to entering the field and guarantee the long-term viability and success of urban agricultural projects. Furthermore, the success of urban agriculture relies heavily on the critical investment in infrastructure, including community gardens and training facilities. Facilitating the availability of resources, technologies, and knowledge can amplify the efficiency and influence of urban farming projects.

Moreover, establishing alliances among municipal authorities, non-governmental organisations (NGOs), and private enterprises can promote the exchange of resources and cooperation, hence enhancing urban agricultural initiatives. Ultimately, by encouraging community involvement and active participation in urban agricultural efforts, it is possible to guarantee that these projects are in line with the specific

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

requirements and preferences of the local population, resulting in more favourable results.

References

- Ahmed, S., Downs, S. M., Yang, C. Y., Long, C. L., ten Broek, N., & Ghosh-Jerath, S. (2020). Rapid tool based on a food environment typology framework for evaluating effects of the COVID-19 pandemic on food system resilience. *Food Security*, 12, 773–778. https://doi.org/10.1007/s12571-020-01086-z
- Aguiar, A., Pinto, M., & Duarte, R. (2022). The bad, the ugly and the monster behind the mirror—Food insecurity, mental health and socio-economic determinants. *Journal of Psychosomatic Research*, 154, 110727. <u>https://doi.org/10.1016/j.jpsychores.2022.110727</u>
- Akinola, R., Pereira, L. M., Mabhaudhi, T., de Bruin, F.-M., & Rusch, L. (2020). A review of indigenous food crops in Africa and the implications for more sustainable and healthy food systems. *Sustainability*, 12, 3493. https://doi.org/10.3390/su12083493
- Alaimo, K., Olson, C. M., & Frongillo, E. A. (2002). Family food insufficiency, but not low family income, is positively associated with dysthymia and suicide symptoms in adolescents. *The Journal of Nutrition*, 132(4), 719–725. https://doi.org/10.1093/jn/132.4.719
- Apostolidis, C., Brown, D., Wijetunga, D., & Kathriarachchi, E. (2021). Sustainable value co-creation at the bottom of the pyramid: Using mobile applications to reduce food waste and improve food security. *Journal of Marketing Management*, 37, 856–886. <u>https://doi.org/10.1080/0267257X.2020.1863448</u>
- Ashby, S., Kleve, S., McKechnie, R., & Palermo, C. (2016). Measurement of the dimensions of food insecurity in developed countries: A systematic literature review. *Public Health Nutrition*, 19(16), 2887–2896. <u>https://doi.org/10.1017/S1368980016001166</u>
- Banerjee, D., & Hysjulien, L. V. (2018). Understanding food disasters and food traumas in the global food system: A conceptual framework. *Journal of Rural Studies*, 61, 155–161. <u>https://doi.org/10.1016/j.jrurstud.2018.04.011</u>
- Berry, E. M., Dernini, S., Burlingame, B., Meybeck, A., & Conforti, P. (2015). Food security and sustainability: Can one exist without the other? *Public Health Nutrition*, 18(13), 2293–2302. <u>https://doi.org/10.1017/S136898001500021X</u>
- Cadillo-Benalcazar, J. J., Renner, A., & Giampietro, M. (2020). A multiscale integrated analysis of the factors characterizing the sustainability of food systems in Europe. *Journal of Environmental Management, 271*, 110944. https://doi.org/10.1016/j.jenvman.2020.110944

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

- Chen, P. J., & Antonelli, M. (2020). Conceptual models of food choice: Influential factors related to foods, individual differences, and society. *Foods*, 9(12), 1898. <u>https://doi.org/10.3390/foods9121898</u>
- Chen, X., Shuai, C., & Wu, Y. (2023). Global food stability and its socio-economic determinants towards sustainable development goal 2 (Zero Hunger). *Sustainable Development*, 31(12), 1768–1780. <u>https://doi.org/10.1002/sd.2482</u>
- Chivenge, P., Mabhaudhi, T., Modi, A. T., & Mafongoya, P. (2015). The potential role of neglected and underutilised crop species as future crops under water scarce conditions in Sub-Saharan Africa. *International Journal of Environmental Research and Public Health*, 12(5), 5685–5711. <u>https://doi.org/10.3390/ijerph120605685</u>
- El Bilali, H. (2019). Research on agro-food sustainability transitions: A systematic review of research themes and an analysis of research gaps. *Journal of Cleaner Production, 221*, 353–364. <u>https://doi.org/10.1016/j.jclepro.2019.02.232</u>
- Elgar, F. J., Sen, A., Gariépy, G., Pickett, W., Davison, C., Georgiades, K., Hammami, N., Azevedo Da Silva, M., Gordon, D., & Melgar-Quiñonez, H. R. (2021). Food insecurity, state fragility and youth mental health: A global perspective. SSM Population Health, 14, 100764. https://doi.org/10.1016/j.ssmph.2021.100764
- FAO, IFAD, UNICEF, WFP, & WHO. (2023). The state of food security and nutrition in the world 2023: Urbanization, agrifood systems transformation and healthy diets across the rural-urban continuum. Food and Agriculture Organization. https://doi.org/10.4060/cc3017en
- Garratt, E. (2020). Food insecurity in Europe: Who is at risk, and how successful are social benefits in protecting against food insecurity? *Journal of Social Policy*, 49(4), 785–809. <u>https://doi.org/10.1017/S0047279419000746</u>
- Giudice, F., Caferra, R., & Morone, P. (2020). COVID-19, the food system and the circular economy: Challenges and opportunities. *Sustainability*, *12*(19), 7939. <u>https://doi.org/10.3390/su12197939</u>
- James, D., Bowness, E., Robin, T., McIntyre, A., Dring, C., Desmarais, A., & Wittman, H. (2021). Dismantling and rebuilding the food system after COVID-19: Ten principles for redistribution and regeneration. *Journal of Agriculture, Food Systems, and Community Development, 10*, 29–51. <u>https://doi.org/10.5304/jafscd.2021.102.019</u>
- Jacobi, J., Mukhovi, S., Llanque, A., Giger, M., Bessa, A., Golay, C., Speranza, C. I., Mwangi, V., Augstburger, H., Buergi-Bonanomi, E., & et al. (2020). A new understanding and evaluation of food sustainability in six different food systems in Kenya and Bolivia. *Scientific Reports*, 10, 19145. <u>https://doi.org/10.1038/s41598-020-76284-y</u>

https://www.lgjdxcn.asia/

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

- Johnston, J. L., Fanzo, J. C., & Cogill, B. (2014). Understanding sustainable diets: A descriptive analysis of the determinants and processes that influence diets and their impact on health, food security, and environmental sustainability. *Advances in Nutrition*, 5(4), 418–429. <u>https://doi.org/10.3945/an.113.005553</u>
- Lambrou, A., Berry, I., Hecht, A., & Labrique, A. (2021). A global food systems framework for pandemic prevention, response, and recovery. *Journal of Agriculture, Food Systems, and Community Development, 10*, 303–308. https://doi.org/10.5304/jafscd.2021.102.015
- Mazac, R., Renwick, K., Seed, B., & Black, J. L. (2021). An approach for integrating and analyzing sustainability in food-based dietary guidelines. *Frontiers in Sustainable* Food Systems, 5, 544072. https://doi.org/10.3389/fsufs.2021.544072
- Mbhenyane, X. G. (2017). Indigenous foods and their contribution to nutrient requirements. *South African Journal of Clinical Nutrition*, 30(1), 5–7. <u>https://doi.org/10.17660/ActaHorti.2016.1132.16</u>
- Ojiewo, C., Tenkouano, A., d'A Hughes, J., & Keatinge, J. D. (2013). Diversifying food and diets: Using indigenous vegetables to improve profitability, nutrition and health in Africa. In J. Fanzo, D. Hunter, T. Borelli, & F. Mattei (Eds.), *Diversifying food and diets: Using agricultural biodiversity to improve nutrition and health* (pp. 155–165). Routledge
- Onyeaka, H., Ejiohuo, O., Taiwo, O. R., Nnaji, N. D., Odeyemi, O. A., Duan, K., Nwaiwu, O., & Odeyemi, O. (2024). The intersection of food security and mental health in the pursuit of sustainable development goals. *Nutrients, 16*(1), Article 2036. <u>https://doi.org/10.3390/nu16132036</u>
- Pawlak, K. (2016). Food security situation of selected highly developed countries against developing countries. *Journal of Agribusiness and Rural Development*, 40(1), 385–398. <u>https://doi.org/10.17306/JARD.2016.42</u>
- Rabbi, M. F., Ben Hassen, T., El Bilali, H., Raheem, D., & Raposo, A. (2023). Food security challenges in Europe in the context of the prolonged Russian– Ukrainian conflict. *Sustainability*, 15(1), Article 4745. <u>https://doi.org/10.3390/su15064745</u>
- Slater, J., Falkenberg, T., Rutherford, J., & Colatruglio, S. (2020). Food literacy competencies: A conceptual framework for youth transitioning to adulthood. *International Journal of Consumer Studies*, 44(4), 412–422. https://doi.org/10.1111/ijcs.12569
- Termeer, C., Drimie, S., Ingram, J., Pereira, L., & Whittingham, M. J. (2018). A diagnostic framework for food system governance arrangements: The case of South Africa. NJAS-Wageningen Journal of Life Sciences, 84(1), 85–93. https://doi.org/10.1016/j.njas.2017.08.001

Journal Of Liaoning Technical University Matural Science Edition ISSN No: 1008-0562

Zou, T., Dawodu, A., Mangi, E., & Cheshmehzangi, A. (2023). Exploring current trends, gaps & challenges in sustainable food systems studies: The need of developing urban food systems frameworks for sustainable cities. *Sustainability*, 15(1), Article 10248. <u>https://doi.org/10.3390/su151310248</u>