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Urban agriculture, local economic development and climate change: conceptual linkages

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ABSTRACT

Globally, cities have become hubs for economic activity, productivity, and important platforms for achieving sustainable development goals. The potential of urban agriculture (UA) in improving urban local economies and urban micro-climate has been acknowledged in the literature. The study looked at how the concepts of UA, local economic development (LED), and climate change can be treated in unison. Based on the review of credible published papers on the various concepts of UA, LED, climate change and nature-based solutions (NBS), a proposed conceptual framework was developed in this paper showing the linkages. The paper established that UA could boost LED, build resilient urban settlements, and promote social inclusiveness, but with social challenges. It is therefore recommended that policymakers make UA a crucial aspect of their agenda in the coming years to address the local economic and climate challenges now and in the future.

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Introduction

Globally, cities have become hubs for economic activity and productivity (Bluhm and Krause, 2022) and important platforms for achieving sustainable development goals. Thus, the extant literature shows that cities produced more than 80% of the total world Gross Domestic Product (World Bank 2020). Similarly, whereas cities occupy less than 5% of the earth's surface, they rather consume more than 75% of natural resources and emit between 60–80% of global greenhouse gases (Musango, Currie, and Robinson, 2017). Again, in 2020 cities host more than 55% of the world-wide population with a projection of 70% by 2050 (Preiss, Schneider and Marsden, 2022). These dynamics present enormous challenges to cities across the world especially those in the Global South ranging from poverty, unemployment, violence, exorbitant prices of foods, violence, climate change, and various forms of disasters among many others (Alaazi and Aganah 2020).

This requires that cities adapt to these colossal difficulties with some researchers advocating the use of nature-based solutions (Atanasova, et al., 2021; Kingsley et al., 2021; Prenner et al. 2021). Langergraber et al. (2021) defined nature-based solutions (NBS) as concepts that bring nature into cities and those that are derived from nature. The concept of NBS is rooted in the idea that it has the potential to address social, environmental, and economic challenges such as climate mitigation and adaptation, ecosystem restoration, resource recovery, and human well-being as well as improve biodiversity status within urban ecosystems (Atanasova, et al., 2021; Kingsley et al., 2021; Prenner et al. 2021). Urban agriculture (UA), a critical component of NBS is increasingly attracting attention (Kingsley et al., 2021; Langergraber et al. 2021) and contributing towards circular cities (Atanasova, et al., 2021).

Indeed, UA is such an essential international development issue due to the increasing levels of poverty and food insecurity in urban areas, especially in Africa

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(Food and Agriculture Organisation, 2012). The product of UA activities continues to serve as a key to the food budget and nutritional supplement for the urban poor resident (Ayambire et al. 2019). This makes UA an important local economic development (LED) strategy that creates jobs to help reduce the urban poor's food expenditure (Mensah 2023a). Similarly, the development of UA promotes social and economic benefits while simultaneously serving as an alternative for urban environmental preservation in cities (Ayambire et al. 2019). This is rooted in the idea that urban and peri-urban agriculture, especially crop farming plays a great role in the sustainability of communities (Edmondson et al., 2020; Lin and Egerer, 2020).

The potential of UA in improving urban micro-climate has been acknowledged in the literature. The HABITAT (2009) has made the point that UA has the capability to enhance the urban environment and climate change adaptation. Thus, whereas cities are becoming susceptible to the effects of climate change and food insecurity, UA can support adaptation and mitigation of climate impacts. In the review of the UA literature, Ayambire et al. (2019) found that UA plays economic, social, and environmental functions, thereby contributing to the sustainability of cities. Other studies have established that UA could potentially enhance climate change adaptation and mitigation as well as improve ecosystem services (Artmann and Sartison, 2018; Edmondson et al., 2020). In particular, UA can reduce urban heat and enhance the resilience of cities (Butler and Hanigan, 2019; Lin and Egerer, 2020). However, some scholars have maintained that UA does not yield a momentous contribution to city sustainability (Yamusa and Adefila, 2014; Becerra-Castro et al., 2015). For instance, it has been argued that the excessive use of agro-chemicals (e.g. Yamusa and Adefila, 2014) and the use of untreated wastewater for irrigating urban farms (e.g. Becerra-Castro et al., 2015) are well known to have harmful health and environmental consequences.

Despite the interconnectedness between the concepts of climate change, UA and LED, the bulk of current research discuss them in isolation (e.g. Azunu and Mensah 2019; Ayambire et al. 2019; Azunre et al. 2019; Pearson et al., 2010) with only a few providing linkages between some of the concepts (e.g. Azunre et al. 2019; Ayambire et al. 2019; Ahenkan et al., 2021; Mensah 2023a). For instance, whereas UA is considered an LED

initiative in urban areas (Malizia et al. 2020; Mensah 2023a) it also has the potential to help mitigate and adapt to climate change (Ayambire et al. 2019; Azunre et al. 2019). Notwithstanding this, the confluence between these concepts of UA, LED and climate change has not been adequately researched. This paper aims to establish a holistic understanding of the interconnectedness between UA, LED, and climate change through the development of a conceptual model.

It is necessary to do so because although UA is not the only way to deal with climate change and boost LED, it can be part of the numerous innovative ways that are springing up to help make the urban landscapes of most cities ecologically and economically sustainable (Mensah 2023a). Also, the nexus between these concepts is in line with the sustainable city concept which aims at a balance between economic development, environmental protection as well as equity in income, employment, shelter, and basic services (Hiremath et al., 2013). Therefore, the research question that guided this paper is as follows: what is the conceptual link between UA, LED, and climate change? The findings of this paper foster an understanding of the interplay between UA, LED, and climate change as an interdisciplinary matter. Thus, the conceptual framework helps to promote an integrative approach when planning urban areas with UA in mind. Also, having a fair understanding of the advantages of UA in developing countries can help in the resource allocation from the government to be used to implement more of this initiative in urban cities of developing economies.

It is imperative to note that materials for this paper were based primarily on credible published papers on the various concepts of UA, LED, climate change and NBS. These published were subjected to the highest scholarly scrutiny and rigour to ensure the academic standard is upheld as well as help the authors to draw significant lessons to refine the current paper. The study proceeds as follows. Following the introduction, the next section examines the literature in the areas of UA, LED, and climate change while the third section provides an overview of the relationship between UA, LED, and climate change. The fourth section explores a conceptual framework that explains the outcomes of UA, LED, and climate change. The last section draws a conclusion and implication of UA on climate change and LED.

Literature review

Urban agriculture

Urban agriculture is a common practice among millions of people all over the world (Appeaning A 2010; Ackerman et al. 2014). Urban agriculture can briefly be defined as the practice of growing, processing and distributing plants and trees within and around urban areas (Orsini et al. 2013; Ayambire et al. 2019). Generally, UA can broadly be seen to include all kinds of agricultural activities taking place in and around cities (Follmann et al. 2021). This practice can also involve the rearing, processing and marketing of livestock around the fringes of cities (Specht et al. 2014). Urban agriculture can take place in several places in urban areas such as in gardens, public fields that are vacant, barns and cellars as well as rooftops and field plots (Canet-Martí et al. 2021; Langergraber et al. 2021). In other words, UA ranges from backyard gardens to tactical gardens, forest gardening, street landscaping, greenhouses, green walls, animal husbandry, vertical farms, urban beekeeping, rooftop gardens, and aquaponics, among others (Spacey 2017; Dane 2020).

In most urbanised areas where UA is prevalent, the practice is focused on using confined and smaller spaces in the production of perishable and high-value products like green vegetables, herbs, fresh milk, eggs, fish, poultry and pig meat etc (Clucas et al. 2018; Azunre et al. 2019). The practice has contributed immensely to the livelihoods of most low-income dwellers, particularly in developing countries and its popularity is a result of the unique benefits gained from those who practice them (Ackerman et al. 2014). As noted by Caputo et al. (2020) UA greatly contributes to employment and income generation, access to healthier diets, leisure opportunities, health improvement, maximisation of food security and promotion of food education and environmental management. Many countries are currently adopting UA as part of NBS for urban resilience (van der Jagt et al. 2017). As noted by Eggermont et al. (2015) NBS are multifunctional green interventions aimed at providing social, economic, and environmental pillars of sustainable development.

Globally, land for UA has been problematic as urban land attracts higher rent (Azunre et al. 2019), making it difficult for urban farmers to compete for land due to their low bid rent. This is explained by two theories: 'bid-rent theory' and 'highest and best use

theory'. William Alonso's (1964) bid-rent theory explained that each land use type has its rent gradient or bid rent curve. This theory has been used to explain how users are willing to pay higher rents for land in an open and competitive land market. Similarly, the highest and best use theory has been used to explain the allocation of city lands that commands high bid rent. Thus, the theory justifies the need to allocate city land for uses that generate the highest net gain over a given period (Fisher and Fisher, 1954). With the idea that UA can be practised in gardens, parks and abandoned spaces, it is encouraged that urban and city officials utilise these spaces to promote agricultural activities (Ayambire et al. 2019; Azunre et al. 2019).

Local economic development

The concept of LED is a departure from the previous top-down development strategies, as it focuses on a bottom-up, participatory, and local-led approach with an emphasis on the use of local resources both human and natural (Mensah et al. 2017, 2019; Akudugu 2018). Thus, in an LED approach, community members could directly take an initiative and participate in determining the use of local resources for socio-economic benefit of all stakeholders (Mensah et al. 2013; Mensah 2023b). LED over the years has emerged as a proven developmental strategy adopted by countries where local people mobilise local resources and coagulate these resources into very refined end products that will be utilised by the same local people (Mensah et al. 2013; Malizia et al. 2020). The idea of LED further goes beyond just economic growth but includes the practice of promoting and bringing local people together for better improvements in the quality of life in a local setting (Mensah et al. 2019; Malizia et al. 2020). It places a lot of importance on the activities that go on in cities, districts and regions and combines economic and social development activities as well as urban planning and infrastructural development to improve local conditions.

With the gradual global shift by central governments from centrally-driven economic development models to a variety of locally driven economic development models initiated by sub-national governments (Akudugu 2018; Mensah et al. 2019), the need for the radical implementation of urbanised agricultural practices as a tool for LED has never been urgent than is currently needed (Diehl et al. 2020; Loker and

Francis 2020; Mensah 2023a). Globally, there have been several clarion calls made to developing countries to radicalise their implementation of LED as an integral part of their development, as well as make UA a focal part of national development (Meyer 2014; Khambule 2018; Malizia et al. 2020; Mensah 2023a).

The general purpose of LED is to build up the economic capacity of a local area to enhance its economic future and the quality of life for all (Mensah et al. 2013). The idea of LED has become a global concept such that it is generally utilised to address poverty and create jobs in urban and rural localities. Several studies have highlighted some of the benefits associated with LED and notable among them are the provision of employment opportunities, providing infrastructure development such as roads and markets that seek to boost economic activities, increasing of household income to equip individuals with skills that will help in enhancing their productivity and poverty reduction (Mensah et al. 2019; Pavel and Moldovan, 2019).

Climate change

Climate change is a global phenomenon where there is a significant change in the climatic conditions of the earth which come as a result of human activities (Nelson et al. 2018). These climatic changes have resulted in most experts issuing various warnings about the threats these changes can have to the sustainability of the earth's ecosystem in the years to come (Berardi and Jafarpur 2020; Kahn et al. 2021). The future survival of mankind has been a subject of discussion because of the negative impacts human activities have on the planet. Some of the main causes of climate change have been traced to the emission of greenhouse gases in the form of carbon dioxide and methane, as well as the burning of fossil fuels (Kahn et al. 2021). Indiscriminate cutting of trees, emission of excessive dust from cement production and other chemical releases from companies are additional causes of climate change (Kompas et al. 2018).

The effects of this phenomenon are devastating and mostly come in the form of rising maximum and minimum temperatures, increase in heavy precipitations as well as shrinking of glaciers (Invidiata and Ghisi 2016). These effects can reflect domestically in the form of an increase in environmental health risks and the unstable cultivation of agricultural produce (Nelson et al. 2018). Climate change also affects the

macroeconomic conditions of nations since a lot of financial resources are spent on combating its effects on human lives (Kahn et al. 2021).

In the past decade, large cities in Asia and Africa like Mumbai, Bangkok, Lagos, South Africa and Manila have faced massive disruptions in their food systems and hampered business operations due to the negative effects of climate change like flooding, shifting seasonal patterns, droughts, water scarcity and waterlogging (Nematchoua et al. 2019; Akinyemi et al. 2020; Nguyen et al. 2022). Cities are the worst to be hit by food and atmospheric crises whenever there is a disruption in the climatic patterns of a geographical setting. The plight of the urban poor who are already under intense suffering becomes even more intense. Climate change together with a decrease in green spaces in urban areas due to the proliferation of infrastructural activities poses a lot of health threats to urban dwellers (Nelson et al. 2018). Urban agriculture has been touted as being one of the strategies that bring multiple benefits to help mitigate the continuous effects climate change is having on the planet (Ackerman et al. 2014; Gyasi et al. 2014; Azunre et al. 2019; Kingsley et al. 2021). There is a huge need for resilient systems that will help combat the challenges posed by climate change.

Urban agriculture, LED, and climate change: exploring the nexus

A review of the literature suggests that there have been quite a several research works that have been carried out on the concepts of UA, LED and climate change (Akudugu 2018; Berardi and Jafarpur 2020). Literature also reveals that there is an empirical understanding of the concepts of climate change, UA, and LED, however, much of these scholarly works have treated these concepts in isolation. A few have however tried to provide linkages between them and to see how they each can relate to the other (Clucas et al. 2018; Canet-Martí et al. 2021). A critical understanding of these concepts proves that these concepts being treated in unison can positively affect society. Over the past decade, UA has moved rapidly into the centre of attention of policymakers particularly in developed countries (Appeaning A 2010). This is because, most research works have highlighted the integral role UA can play not only in the socioeconomic system of urban areas but also in the ecological system as well

(Gyasi et al. 2014; Van Veenhuizen 2014; Cobbinah et al. 2019).

A careful assessment of scholarly works however reveals several ways UA can play a significant role in LED. Comparing UA and LED there are several plausible links and impactful integrative potential of these two concepts. Local settings in most urbanised areas and cities in developing countries are riddled with enormous challenges and as a result, should take advantage of the practice of UA to curb some of the challenges (Mensah 2023a). From the literature, the subject of UA is flourishing in most European and African metropolitan areas (Bellwood-Howard et al. 2015; Lohrberg et al. 2016). The meaning and implementation of each of the concepts, however, raise plausible assertions that can be made on the role urban agricultural practices may play in LED among developing countries.

Local government and individuals in local areas by efficiently utilising spaces in urban areas can grow crops and other fresh farms produce as well as rear livestock or poultry and fish to help provide adequate food and more local employment opportunities in these localities (Diehl et al. 2020). Thus, UA can play a role in LED by helping boost commercial activities in the local areas (Orsini et al. 2013; Gyasi et al. 2014). Urban agriculture is also crucial to helping not just produce food for the local community but also help create true communities (Orsini et al. 2013; Colson-Fearon and Versey 2022). Local communities, through UA, can develop a sense of belongingness and connectedness to each other since they are practising a common agenda and trading farm products amongst themselves.

One of the challenges prevalent in most urbanised settings in developing countries is the issue of hunger and poverty. Hunger and poverty are common plagues that have afflicted most urban dwellers over the years (Kuddus et al. 2020). The increase in slums, lack of adequate infrastructure and the lack of proper employment opportunities for the rapidly growing urban population in urban settings have contributed to the high levels of hunger and poverty experienced by individuals who live in these areas (Aggrey-Korsah and Oppong 2013). A careful assessment of the concept of UA is a regular practice among individuals and has the potential to help alleviate the high level of hunger and poverty experienced in these areas (Olivier and Heineken 2017; Canet-Martí et al. 2021). The adoption of UA, as a policy by local authorities

and as a practice by local people, can contribute immensely to reducing these problems (Appeaning A 2010; Ackerman et al. 2014).

Additionally, the concept of UA can play a strategic role in mitigating some of the risks and damages the human race will suffer as a result of climate change (Haberman et al. 2014; Van Veenhuizen 2014; Cobbinah et al. 2019). Taking advantage of spaces to plant trees, and UA in cities can mitigate the emissions that damage the planet and help sustain the climatic conditions, particularly in these areas. One of the main ways UA contributes to the control of climate change is the fact that it helps to 'green' the environment (Tornaghi 2014; Van Veenhuizen 2014). Concerning the sustainable development goals (SDGs), UA potentially contributes to SDGs 1 (no poverty), 2 (zero hunger), 12 (responsible consumption and production), 13 (climate action) and 15 (life on land).

This practice of cultivating crops and planting trees in cities can regulate the climate and help reduce climate change by releasing more oxygen into the atmosphere and removing the carbon dioxide that is released into the air by the sources that emit them and storing into in the trees and soil (Van Veenhuizen 2014). The environmental quality is also most likely to improve significantly because their pollutants are removed from the air by the presence of these trees and crops that are planted through UA (Clucas et al. 2018). Another major contribution of UA to climate change lies in the ecological effects it has on communities that practice it (Gyasi et al. 2014; Azunre et al. 2019). The practice of UA is relevant for the enhancement of the ecosystem and for creating a resilient urban environment that can help mitigate disasters (Appeaning A 2010). The cultivation of crops and planting of trees in urban settings can keep the ground moist and fertile to avoid droughts. It also helps reduce the impact of floods and landslides on communities by slowing down the movement of water and mudflows respectively (Appeaning A 2010).

The concept of UA, climate change and LED are not without any controversy. A few concerns have been raised by some environmentalists who believe that the fertilisers and chemicals used in growing crops and controlling pests in UA serve as pollutants to the air as well as to water bodies when they are washed away by rain (McClintock 2014). These include soil contamination, arsenic, mercury, cadmium, and polycyclic aromatic hydrocarbons (Wortman and Lovell 2013). Others have also raised concerns about the

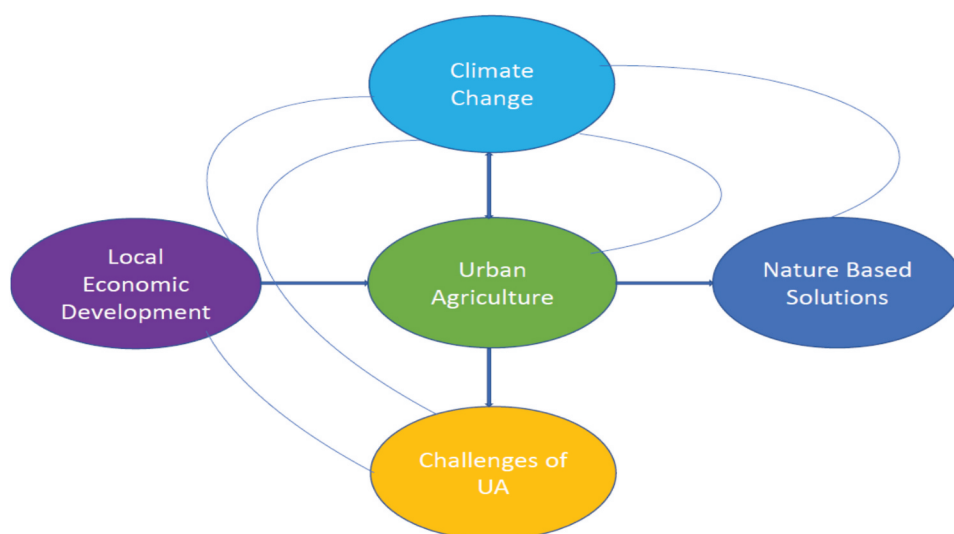


Figure 1. Urban agriculture, local economic development, and climate change linkages.

feasibility of urban agricultural projects in urban communities (Ayambire et al. 2019). They believe that the infrastructural invasion going on in most urban settings globally will automatically hamper the implementation of agricultural projects which they think should be relegated entirely to rural communities (Pandey and Seto 2015; Follmann et al. 2021). Other scholars have questioned the true nature of climate change as presented by climate change activists (Krieger 2015; Rendall 2019; Hoogendoorn et al. 2020). They believe that climate change is part of the natural cycle of the world and that no matter how the universe changes, life will always find a way as has been from time immemorial (Rendall 2019).

On LED, some critics have debunked the true impact of and have questioned whether such concepts can truly be adopted in developing countries because of how sophisticated the concept looks in their geographical settings (Malizia et al. 2020). Arguments have also been raised on the real economic benefits UA can have on local economies. Some scholars believe the benefits of UA are over-emphasised (Orsini et al. 2013; McClintock 2014) whereas others are of the view that several benefits can be drawn from the practice (Ackerman et al. 2014; Specht et al. 2014). Whatever the arguments are for or against UA, climate change and LED, it is important to state that the evidence so far suggests, that despite some reported concerns, these concepts can have significant influences, especially on urban dwellers

and thus they should be looked in the light of each other.

Urban agriculture, LED, and climate change: towards a conceptual framework

As already stated in this study, UA, LED, and climate change are not new concepts. However, the bulk of studies conducted on these concepts has looked at them in isolation with only a few (Clucas et al. 2018; Canet-Martí et al. 2021) providing plausible linkages between these separate concepts. The goal of this study was to give a reflection on how these concepts can be treated from an intertwined position. It revealed ways the concept of UA can contribute positively to LED. It also showed the necessity of UA in mitigating the effects of climate change on urban societies and as a form of NBS system. It showed how UA can help create sustainable urban societies that are socially, environmentally, ecologically, and economically resilient. Based on the literature review and the linkages between the concepts in this study, a conceptual framework is provided in Figure 1.

The conceptual framework (Figure 1) shows how UA has consequences for the environment and ecology (climate change), LED, and NBS systems. It also suggests that UA has challenges that can affect LED and climate change. First, the framework suggests that UA has several benefits in terms of food security and nutrition, improved health status, community

building and social inclusion. Indeed, Olivier and Heineken (2017) maintain that while the economic benefits of UA are essential, the social advantages are likewise valuable, particularly in the less-privileged communities that are stuck in a poverty trap. Food security has become a global issue and it has been noted that UA serves as food security and supplements poor households with healthy food, thereby increasing vitamin intake (Mauder and Meaker 2007). Urban agriculture is crucial in creating true communities by developing a sense of belongingness and connectedness to each (Orsini et al. 2013).

Second, the UA linkage with LED shows that it has the potential to create employment, development of micro-enterprises, increase income and reduce poverty. The extant literature shows that UA employs urban farmers especially in the Global South (Darkey et al., 2014). Not only will UA lead to employment but also help boost local commercial economic activities. Thus, because of UA, there will be more people buying and selling agricultural produce in local areas (Orsini et al. 2013; Gyasi et al. 2014). Additional incomes will be generated for farmers, traders, and community members through the vibrant local economy (Specht et al. 2014; Clucas et al. 2018). The provision of employment and boosting of local commercial economic activities due to UA will certainly improve

the incomes of individuals either directly involved in or created businesses out of UA. All these positive impacts of UA have implications for poverty reduction. According to Azunre et al. (2019), UA does not only employ urban farmers but all stakeholders along the value chain. They depicted this with a conceptual framework as illustrated in Figure 2.

Third, the conceptual framework emphasises the linkage between UA and climate change. As scholars have indicated, UA plays an important role in mitigating some of the risks of climate change (Haberman et al. 2014; Cobbinah et al. 2019). Urban agriculture greens the environment and this helps in mitigating the effects of climate change (Tornaghi 2014; Van Veenhuizen 2014). Through the absorption of carbon dioxide and the release of oxygen by crops and trees, UA helps to mitigate climate change (Van Veenhuizen 2014). This results in the removal of harmful fossil fuels and other harmful substances in the air. For instance, Ghosh (2004) and de Zeeuw (2010) argued that UA contributes to the reduction of emissions from harmful sources. The literature also showed that UA is imperative in enhancing the ecosystem and eventually creating an environment that is resilient and helping in mitigating climate-induced disasters (Appeaning A 2010). Climate change has caused challenges such as drought, however, UA can help

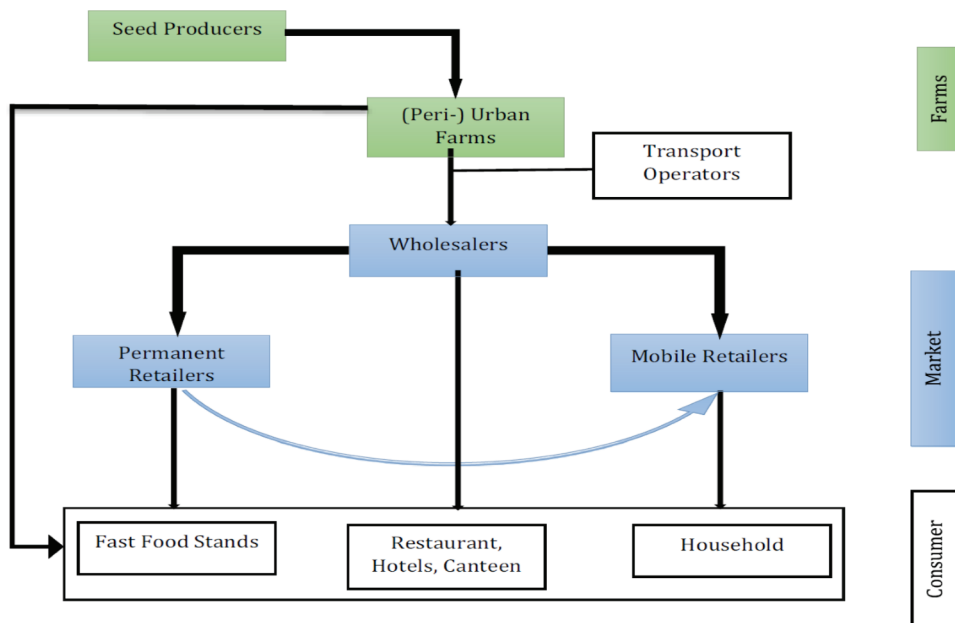


Figure 2. Flow chart of the vegetable supply chain in urban and peri-urban areas. Source: Azunre et al. (2019)

minimise drought by keeping the ground moist and fertile most of the time. Other climate-related disasters such as floods and landslides can be slowed down by the activities of UA (Appeaning A 2010) as the empty lands in the cities are covered with vegetation.

Fourth, UA is a critical component of nature-based solutions that should be considered useful by city authorities in dealing with a myriad of urban constraints and climate emergencies. Thus, UA has the potential to address a city's environmental, social, and economic benefits through a NBS approach. Research has indicated that NBS harness the power of nature for the restoration, enhancement, and regeneration of ecosystems to solve social and environmental challenges (Frantzeskaki 2019). Fifth, it has also been stated that UA may pose certain challenges such as contamination of crops, occupational health risks, reduction of vegetation and siltation of water bodies. It is believed that the use of fertilisers and chemicals in UA can be a source of pollutants to the air as well as to water bodies when they are washed away by rain (McClintock 2014). Similarly, Duzi et al. (2014) maintained that UA can result in the contamination of the environment through air, soil, or water and subsequently a transmission into the crops, thereby impacting the health of consumers. The challenge also includes the transmission of diseases from domestic animals to people (Duzi et al., 2014).

The challenges of UA are also linked and impact climate change as well as LED. Despite the challenges of UA, the conceptual framework posit that the three concepts can have significant influences, especially on urban dwellers and thus they should be looked at considering each other. Looking at the conceptual links drawn in this paper between UA, LED, and climate change, a high level of attention must be given to these concepts, particularly around research by academics, as well as practice and policy by the government, NGOs, and all well-meaning stakeholders in urban areas.

Implications and conclusion

Urban agriculture is gradually evolving into a way of life in most cities. Globally, it is making substantial socio-economic and ecological contributions to the livelihoods of urban dwellers. This paper indicated that a greater portion of the advantages enjoyed from this practice has been economic, evidence also proves moderate gains have been made concerning

environment and climate change mitigation. With the rate at which cities are growing globally, especially in developing countries, it is important to fashion proper measures that will use UA as a primary means to fight the adverse effects of climate change in the future as well as help boost the economic life of local communities. This will require the efforts of government officials and policymakers who will formulate appropriate policy directions and provide appropriate institutional support and coordination.

Concerning the application of the conceptual framework, urban authorities should allocate available spaces for UA through conscious zoning of urban land. The purpose is to ensure cities enjoy the benefits that come with UA especially those related to ecological functions as cities are heavily affected by climate change. From the framework, it is imperative for city authorities to note that UA has wider implications as it is connected with several other important issues such as LED, climate change and serves as NBS in the management of a city. Urban policymakers and practitioners should also look at influencing government and local authorities on feasible ways UA can be harnessed to help influence LED as well as mitigate the adverse effects of climate change in urban societies. As shown in this study, there is a lot to be gained by countries that practice UA as a tool for boosting LED and mitigating climate change. These advantages range from an increase in employment opportunities, alternative means of income, reduction of urban hunger and poverty, provision of fresh and healthy farm produce for urban dwellers, the boosting of commercial activities in urban settings as well as the creation of a very engaging and socially inclusive harmonious society.

A careful assessment of scholarly works will also reveal that the concept of climate change has a lot of long- and short-term effects on the level of development of a local community. These effects can come in many ways like food shortages, rise in sea levels, changes in weather conditions as well as other health and environmental challenges. All these challenges put a lot of strain on the economy of local governments who spend a lot to try to curb these challenges. It is necessary to note that UA has the power to positively affect these two concepts. The climate change, UA and LED nexus can deeply and properly be explored by scholars. This framework addresses ways to harmonise these three research streams in meaningful ways for both literature and practice. Lastly, more need to be

done by scholars in closing the gap which exists concerning the lack of studies on the linkages between these concepts, especially in the global south.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes on contributor

James Kwame Mensah is a Senior Lecturer at the University of Ghana Business School and a fellow at the Penn Institute for Urban Research, University of Pennsylvania, USA. He holds PhD in Development Administration, and his research focuses on local economic development, urban informality and public sector management. His publications have appeared in top-tier journals, consulted for several organisations, and have been involved in the development of government policies in Ghana.

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