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Baffoe, Gideon and Antwi-Agyei, Philip (2025) Rethinking the potential of urban agriculture as a climate resilience strategy:evidence from Accra, Ghana. *City and Environment Interactions*. 100229.

<https://doi.org/10.1016/j.cacint.2025.100229>

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Rethinking the potential of urban agriculture as a climate resilience strategy: Evidence from Accra, Ghana

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ARTICLE INFO

Keywords:

Urban agriculture
Policy integration
Resilience
Climate change
Accra

ABSTRACT

Urban agriculture (UA) is increasingly recognized as a potent strategy for addressing contemporary urban challenges, particularly in the developing world, where rapid urbanization and climate change impacts are rising. However, the role and the extent to which UA has been integrated into national strategic policies and programmes remain underexplored in African cities, especially Accra, Ghana. This paper explores the role of UA in building climate resilience in Accra, Ghana, from the perspective of policymakers. It critically examines the extent to which UA has been integrated into national policy frameworks and identifies the barriers undermining its broader adoption and implementation. We employ a mixed-methods approach, drawing on stakeholder interviews, document analysis, and policy reviews to provide empirical insights while guided by resilience theory and the political ecology framework as analytical lenses. Stakeholder perspectives indicate that UA contributes to resilience through localized food production that supports nutritional security, the use of treated wastewater to enhance water efficiency, and the maintenance of green cover that buffers against urban heat and flooding. However, its integration into policy frameworks remains limited due to challenges such as weak institutional coordination, competing economic priorities, and governance inefficiencies. The study notes that UA holds transformative potential for climate resilience in Ghana, but its success hinges on strategic policy integration and robust implementation mechanisms. The paper proposes actionable strategies, including the formal recognition of UA zones, improved cross-agency and ministerial coordination, and the incorporation of farmer associations into decision-making processes.

1. Introduction

The 21st century has seen unprecedented transformations in all spheres of life. Cities across the globe remain one of the systems undergoing rapid change, stemming from growing urbanization. Cities, particularly in the Global South, are experiencing uncontrolled growth due to weak planning and urban management systems [1]. It is estimated that by 2025, 90 % of the world's urban growth will occur in Africa and Asia [2]. In Sub-Saharan Africa alone, it is projected that 670 million people will be living in cities by 2030 [3]. Without appropriate measures, the impact on these regions will be huge, compounding and intensifying existing conditions of sprawl, inequalities, and poor governance [4,5]. This has the potential to further compound prevailing vulnerabilities and inequalities. However, well-managed urbanization could be leveraged for employment opportunities, improved services, and infrastructure [3]. Regardless, studies have shown that urbanization

creates rifts in the biotic and abiotic environments, often leading to heightened exposure to events that undermine the well-being and sustainability of cities [6]. Therefore, strategies that have the potential to address challenges posed by urbanization must be prioritized [7,8].

Urban Agriculture (UA) has emerged as one of the strategies with a strong promise to make urban environments resilient. As a critical green infrastructure, UA encapsulates “the production of crop and livestock goods within cities and towns” [9]. These activities can contribute to the effective functioning of urban ecosystems while reducing cities' exposure to extreme events [10,11]. As a livelihood strategy for many low-income urban dwellers [12], UA is considered a potent poverty alleviation tool [6], offering employment to over 200 million urban farmers across the world [13]. Evidence shows that by 2030, the global demand for UA produce will increase substantially [14,15], underscoring its critical role in ensuring urban food security. Several studies have highlighted the critical role that UA plays in the rapidly urbanizing

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<https://doi.org/10.1016/j.cacint.2025.100229>

Received 12 February 2025; Received in revised form 15 July 2025; Accepted 17 July 2025

Available online 25 July 2025

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world, ranging from improving food sovereignty in deprived areas [16], crime prevention [17], and biodiversity conservation [18] to providing education opportunities for sustainability transition [19]. In Africa, for instance, research indicates that over 35–40 million people depend on UA for their dietary requirements [20,21]. Elsewhere in Portugal, it is considered a key strategy for food security and social integration [22]. In ecosystem services, UA plays a critical role in water recycling [23], dust absorption and air purification [11], and reducing urban heat island effect [24], but also addresses problems associated with stormwater runoff [25]. Nonetheless, UA also presents risks in developing cities, including pollution and flooding exposure, low hygiene standards, and poor regulation of practices [26,27].

With the accelerating impacts of climate change, including sea level rise, flooding, erratic rainfall, and rising temperatures, cities like Accra, Ghana, are constantly threatened by elevated vulnerability to food insecurity, socioeconomic inequality, and environmental degradation [28–30]. UA holds strong promise as a multifunctional land-use strategy for enhancing climate resilience, securing livelihoods, and promoting environmental sustainability [31,32]. It can drive climate-resilience by, for instance, reducing food transportation mileage and fertilizer application, improving rainwater infiltration, and increasing access to healthy diets [28,29,31,33]. Despite its potential, however, UA remains underexplored and inadequately integrated into national policy frameworks, limiting its capacity to address pressing urban challenges, including climate change.

In Ghana, the intersection of urbanization and climate change presents a major challenge to urban resilience and inclusive development. The current picture portrays an exposed urban system devoid of critical human-centred planning and development instruments for building resilience and transformative change. Therefore, the need for adaptive urban strategies that combine socio-economic benefits with environmental sustainability cannot be overemphasized. This becomes more pressing with the projection that by 2030, over 60 % of the population will be residing in urban areas in Ghana [34]. Rapid urbanization, coupled with the impacts of climate variability, has exacerbated vulnerabilities in urban Accra, with rising poverty and inequalities being commonplace. Although UA has demonstrated potential to create resilient cities, it is unclear the extent to which it is integrated into strategic national policies as a livelihood and climate resilience building strategy in urban areas. For instance, Ghana's urban planning policies, including the National Urban Policy Framework (2012), largely sideline UA, treating it as an informal or transitional activity. Agriculture is typically addressed in rural development frameworks, with limited recognition of its urban forms. This marginal recognition is also evident at the local level. For example, the Accra Metropolitan Assembly's (AMA) Medium-Term Development Plan (2022–2025) makes little reference to urban agriculture, with no zoning designation or funding framework for such activities. Interactions with AMA officials revealed that, informally, the Assembly often tolerates UA along roadside verges, drainage reserves, and institutional open spaces, treating them as transitional land uses. These practices persist despite insecure land tenure and weak policy support. The absence of formalized municipal-level statutes reinforces the need to examine national policy frameworks where strategic support for urban agriculture might be more systematically anchored.

While existing analyses in Ghana (e.g., [31,35–38]) have been instrumental in understanding UA practices and governance structures, these studies fall short in analysing their integration into national policies and programmes as a climate resilience-building strategy in urban areas. It is unclear the extent to which UA has been integrated into strategic national policies and framework as a livelihood and climate resilience building strategy in urban areas. This is an important research gap that demands urgent interrogation. This paper addresses this gap by directly engaging key policymakers on their perception of the UA-climate resilience nexus, in addition to identifying the barriers they encounter in integrating UA into national policies. Specifically, the

paper investigates three interrelated objectives: (1) to explore the role of UA in enhancing climate resilience in Ghanaian cities, (2) to examine the extent to which UA has been integrated into strategic national policy frameworks, and (3) to assess the barriers impeding its integration into policy frameworks. The study employs an interdisciplinary lens, drawing on resilience theory and the political ecology framework to guide the analysis. Resilience theory enables the analysis of how UA can enhance the adaptive capacities of urban systems to climate stressors, particularly through decentralized food production, water recycling, and green infrastructure. Political ecology, on the other hand, provides insights into how socio-political power dynamics, such as land access, institutional fragmentation, and policy neglect, shape the marginalization of urban agriculture in formal governance. This offers a novel approach to comprehensively understand the nuances of UA and policy integration barriers. The study contributes to the growing body of literature on urban sustainability and offers actionable insights for policymakers, practitioners, and researchers. This paper offers new perspectives on how urban agriculture can be integrated into national policy frameworks as part of Ghana's broader climate adaptation agenda aimed at enhancing climate resilience. In achieving the study objectives, the study will address the following questions:

1. What is the role of UA in enhancing climate resilience in Ghanaian cities?
2. In what ways do urban farmers perceive their activities as contributing to climate resilience? What is the extent to which UA has been integrated into strategic national policy frameworks?
3. What are the key barriers and opportunities for integrating UA into formal national strategic policy documents?

The study is structured as follows. The next section provides a theoretical background to ground the study. Section three introduces the methodological approach, including the theoretical lenses employed. Section four presents the results, while section five discusses them. Section six concludes the study.

2. Urban agriculture and climate resilience

Cities across the world face a myriad of challenges, including food insecurity and exposure to climatic events, undermining their functionalities and sustainability outlook. While advanced economies in the Global North have the needed resources and technology to contain some of these existential threats, the situation is different in the developing world. The need for an inexpensive but effective strategy to combat climatic impacts and food insecurity in the Global South remains a laudable idea in both policy and academic circles [39]. UA has emerged strongly and is increasingly seen as a critical component of building functional cities, particularly in the context of climate resilience and food security. As it stands at the intersection of environmental sustainability and climate resilience, it offers an incredible, multifaceted approach to urban challenges. Cities like Toronto, for instance, have integrated UA into their climate action plans, providing models for policy innovation. While Toronto's Green Roof Bylaw has been instrumental in promoting green infrastructure, it has also indirectly provided the needed traction for UA by advocating vertical gardening [40]. These are practices that could guide policy development in cities in the Global South, such as Accra, where urban growth and climate change pressures are acute.

In the developing world, the role of UA in addressing vulnerabilities related to climate change, urbanization, and socioeconomic inequalities is gradually being recognized [41,42]. In addition to food security, UA improves public health and social capital while promoting circular economies [43]. Essentially, it contributes to building climate resilience through the diversification of urban food systems, reduction in carbon footprint associated with food transport, and enhancement of local ecosystems [33,37]. Non-governmental organizations such as RUAF

Foundation have been instrumental in promoting UA's role in enhancing food security and resilience in urban Africa, including Ghana (RUAF [44]). Their participatory planning tools and urban food strategy support offer valuable frameworks for policy uptake. Evidence indicates that practices such as rooftop gardening, community gardens, and vertical farming hold strong promise in mitigating urban heat islands, improving air quality, and managing stormwater [11,24]. These activities not only support biodiversity but also help in adapting to climate variability by providing a buffer against food insecurity during climate shocks [28,29]. The study by Gómez-Baggethun & Barton [45] on urban green infrastructures highlights the critical role of UA in the larger ecological network, supporting urban wellbeing and resilience.

Despite its unquestionable potential, however, systemic challenges persist in promoting UA as a viable urban development and sustainability strategy. The extent to which countries in the developing world prioritize UA in strategic national policies leaves much to be desired, partly explaining why there is limited awareness of its climate resilience potential in the developing world [37]. The lack of supporting frameworks is believed to have been a major cause of many land use and zoning conflicts [46]. Culturally, it is perceived as an informal and transient activity rather than a viable livelihood and potent urban sustainability and resilience strategy [35], underscoring its low uptake among the populace. In Ghana, for instance, land use planning policies barely promote UA practices in cities [36], explaining their limited recognition and acceptance. This has given impetus to recent analyses where scholars have begun exploring the UA governance structure. In their review of UA practices, Anaifo and Aholgo [35] noted significant governance and land-use policy barriers. Similarly, Kuusaana et al. [36] reported that although UA practices are growing, they lack supporting formal frameworks. Although these findings suggest a disconnect between grassroots practices and national policy frameworks, which is crucial for understanding the potential of UA in climate resilience, they fall short of analysing the extent of integration into strategic policy documents. There may not be a specific or standalone UA policy, but to what extent is UA embedded in other national policies (e.g., National Development Plan, Climate Action Plan) as a strategic tool for climate resilience? How do policymakers perceive the role of UA in climate resilience, and what are the challenges that confront them in an attempt to integrate UA into national policies? These are critical questions that research needs to address to help improve the understanding of UA in the national development agenda. The present study attempts to answer these questions using Ghana as a case study.

2.1. Theoretical Framework: Resilience theory and political ecology

This study adopts an interdisciplinary lens, integrating resilience theory and political ecology framework in analysing the issue. Rooted in ecological systems thinking, resilience theory presents a valuable lens to explore the UA-climate resilience questions in this study. The theory emphasizes the capacity of systems to absorb disturbances while maintaining core functions [47]. In urban landscapes, it entails the capacity of cities to adapt and transform in response to stressors and shocks [48]. In the context of UA, resilience is not only about withstanding climate adversities but also about leveraging UA practices to enhance urban ecosystems' adaptability. It can be understood in three dimensions: absorptive capacity (ability to absorb shocks), adaptive capacity (ability to adapt to changes), and transformative capacity (ability to fundamentally alter systems to better cope with future changes) [47]. This framework helps in understanding how UA can contribute to these capacities by providing food security, reducing urban heat islands, and improving local biodiversity [49]. In Ghana, where climate variability threatens food security, applying resilience theory highlights the adaptive strategies necessary for UA to thrive under constrained conditions.

On the other hand, political ecology offers a potent lens for analysing how socio-political dynamics influence environmental practices and access to resources. The framework emphasizes the intersection of

power, resources, and environmental governance, highlighting how inequalities shape access and control [50]. In Accra, UA is constrained by power imbalances and dynamics, where urban elites and commercial developers dictate land allocation and access, often marginalizing urban growers who lack a voice. This framework is crucial for analysing why UA might be underutilized or only partially integrated into policy frameworks in Ghana. It is relevant in examining issues like land tenure, governance, and policy-making processes, which are critical in shaping urban agricultural practices [51]. Previous analysis in Lagos, Nigeria, illustrates how urban land-use conflicts are mediated by political and economic interests, often neglecting sustainable practices like UA [52]. Combining these frameworks allows for a nuanced understanding of UA in Ghana. While resilience theory focuses on adaptive strategies to climatic and systemic shocks, political ecology examines the socio-political barriers undermining UA integration into national policy frameworks. Together, they provide a robust analytical foundation to investigate UA's role in fostering climate resilience and to identify pathways for inclusive policy reforms.

3. Methodology

3.1. Study area

Ghana was selected as a case study country because of its unique economic, environmental and socio-cultural characteristics. Past studies, including Antwi-Agyei et al [53] and Klutse et al [54], have identified the country as a climate change vulnerability hotspot. Accra, the capital of Ghana, is a vibrant urban hub with diverse socio-economic and environmental dynamics, making it an important site for research. The Accra Metropolitan Area has a population of 2,721,000 in 2024, representing an increase of 2.29 % from 2023 [55]. Urban agriculture is gaining prominence in Accra and provides livelihoods for many urban poor and marginalised. Accra lies in the coastal savanna zone, with sparse vegetation of grasses, shrubs, and scattered trees such as baobabs and acacias, coastal mangroves and sandy shorelines, and urban greenery, including ornamental trees like neem, palms, and bougainvillea. Its strategic location along the Gulf of Guinea and its role as a commercial, administrative, and cultural center provide a unique context for studying urbanization, climate impacts, and development challenges. The city is relatively flat, with an elevation ranging from sea level to about 75 m. There is a greater demand for vegetables and other produce that are produced from these urban farms, making these farm enterprises a booming and lucrative venture for many urban farmers.

3.2. Study approach

This study adopts a mixed-methods design, drawing on resilience theory and political ecology as analytical lenses for understanding the challenges of urban agriculture as a climate resilience strategy in urban areas in Ghana. The study adopted a mixed-methods design combining policy document analysis (n = 15), key informant interviews (n = 26), and site visits to four urban farms (n = 4). This approach allowed triangulation between institutional discourse, lived farming experiences, and field observations to gain a holistic understanding of the relationship between UA and climate resilience. The study employed a three-phase design approach to explore the questions.

In phase one, we used iterative content policy analysis to understand the extent to which UA has been incorporated into sectoral and national policies and programmes relating to climate change resilience and agricultural development in Ghana. The key policies analysed included the National Climate Change Policy, National Climate Change Adaptation Strategy, the Nationally Determined Contributions, National Communications, Ghana: Roadmap for Resilient Infrastructure in a Changing Climate, Ghana Agriculture Sector Policy Note, and Ghana Agriculture Development Policy Operations (see Table 1 for the full list). These policies were identified through a desk review and consultations with

key stakeholders in Ghana's climate change and agricultural development space. The policies broadly shape climate change resilience-building efforts and agricultural development in Ghana. Following previous analyses [56,57], we analysed each of these policy documents to understand how urban agriculture has been framed as a climate resilience strategy and determined the dominant discourse by exploring the frequency at which important keywords appeared in the policy. Thus, we analysed policy documents using an iterative thematic coding. Keywords such as "urban agriculture," "urban farm," "resilience," "climate resilience," and "climate adaptation" were used to identify relevant text segments. These were coded and categorised based on frequency, emphasis, and placement in policy documents. We used the frequency analysis of the keyword occurrences across the 15 strategic policy documents to generate a heatmap. Segments containing these keywords were identified using content search and manually validated for contextual relevance. The frequency values were then plotted using Microsoft Excel's conditional formatting to generate a heat map that visually highlighted the level of emphasis placed on urban agriculture and climate resilience in each policy document. Keywords employed for this analysis are included in Table 3. The key terms were searched across all 15 national policy documents.

In the second phase, we visited farm sites within the Accra metropolis to understand the key issues associated with urban agricultural production systems as a climate change resilience strategy. We visited four farm sites: Korle Bu, Plant Pool, Okplongo, and Kawukudi (see Fig. 1 and Plate 1). These farms were purposively selected based on geographic distribution, size, farming practices (e.g., vegetable cultivation, water use), and history of engagement with local government and years of operation. The selection was made after consultation with stakeholders'. Each site varied in size from 0.5 to 1.5 ha, with common crops including lettuce, cabbage, spinach, okra, and maize. The selection captured different urban settings, including inner city and roadside, to understand spatial and governance diversity.

In the third phase, the study explored the challenges impeding the integration of urban agriculture as a climate change resilience strategy by conducting interviews with key stakeholders drawn from institutions and ministries responsible for addressing climate change challenges and promoting agricultural development in Ghana. We conducted interviews with 9 Government institutions at the forefront of policy decisions (Table 2). We employed the snowballing technique, interviewing 26 stakeholders, as detailed in Table 2. The participants included 11 farmers and 15 other stakeholders, comprising policymakers, research institutes, academics, and civil society actors. The selection of 11 urban farmers was based on thematic saturation observed during interviews with the associations, with no new insights emerging after the 9th interview. The remaining stakeholders were selected to ensure

Table 2

Key ministries and institutions interviewed.

Institution/Ministry	Type of Stakeholder	No. Interviewed
Environmental Protection Agency (EPA)	Regulatory Body	2
Ministry of Food and Agriculture – Crop Services Directorate	Policymaker/Regulatory	2
Science and Technology Policy Research Institute	Policy Research Institute	1
Land Use and Spatial Planning Authority (LUSPA)	Regulatory Body	1
Ghana Meteorological Agency	Communication/Met Agency	3
International Water Management Institute (IWMI)	Research Organization	1
Regional Institute for Population Studies, University of Ghana	Academic Institution	1
Climate Change & Sustainability Centre, University of Ghana	Academic Institution	2
Department of Agricultural Economics, University of Ghana	Academic Institution	1
Ghana Green Label	Technical & Certification Scheme	1
Farmer's Associations	Farming Association	11
Total		26

institutional diversity and policy relevance. The interviews focused on their perception of why UA is important for cities and what role it can play in building climate resilience. The interviews followed a semi-structured format, recorded with a voice recorder, with the consent of respondents and later transcribed. Interviews were conducted in July 2024 for two weeks. The 26 interviews were deemed sufficient to reach thematic saturation, capturing diverse perspectives from farmers, urban planners, policy officials, and civil society representatives. While additional interviews might offer incremental insights, the selected sample provided a representative cross-section of key stakeholders. Interview data were transcribed, coded, and analysed using thematic analysis. Themes were cross-validated with policy analysis findings to identify common themes and disjunctures in institutional understanding versus practices.

4. Results

Of the 26 stakeholders interviewed, 11 were urban growers, 9 were policy officials, 4 represented research institutes, and 2 represented academia. Participants were between 25–60 years old. Specifically, farmers ranged in age from 28 to 60, with an average of 14 years of urban farming experience. Landholdings varied between 0.5 and 1.5 ha, and most cultivated short-cycle vegetables such as lettuce, spinach, and green pepper. A majority relied on hand irrigation using wells and wastewater from nearby drains. The majority of the participants were male (55 % against 45 % females).

4.1. The role of UA in building climate resilience

UA is considered a critical strategy in enhancing climate resilience, particularly in rapidly urbanizing cities like Accra, Ghana. Drawing on insights from key stakeholders involved in the sector, this section explores its role in building climate resilience in Ghana. It was revealed during stakeholder interviews that one of the primary benefits of UA is its ability to mitigate the impacts of seasonal food shortages, particularly during periods of drought (see Fig. 2). This was highlighted by several stakeholders, with one explaining:

"From December up to June, production decreases significantly. In December, when they plant, it's during the dry season. They need supplementary irrigation to ensure the plants grow well and produce a good yield. However, when water resources become scarce in

Table 1
Ghana Strategic Policy Documents on Climate Change and Agriculture.

SN.	Policy	Year
1	Food and Agriculture Sector Development Policy (FASDEP II)	2007
2	Ghana Agriculture Sector Policy Note	2014
3	Ghana Agriculture Development Policy Operations	2011
4	Ghana National Urban Policy Framework and Action Plan	2012
5	Ghana's Revised Nationally Determined Contribution under the Paris Agreement	2021
6	Ghana National Climate Change Adaptation Strategy (NCCAS)	2012
7	Ghana: Roadmap for Resilient Infrastructure in a Changing Climate	2022
8	Ghana National Development Policy Framework: National Medium-Term Development Policy Framework 2022–2025	2022
9	Ghana National Spatial Planning Framework	2015
10	National Climate Change Policy	2013
11	National Climate Change Master Plan	2015
12	National Urban Policy Framework	2012
13	Nationally Climate Smart Agriculture and Food Security Action Plan	2015
14	National Determined Contributions	2015
15	Revised Nationally Determined Contributions	2021

Table 3

Ghana's national strategic policy documents expected to champion UA and climate resilience.

Key terms in UA and climate change	Strategic National Policy Documents													
	ASPN	FASDEP II	GNSDF	GNCCP	NCSAFSAPG	NCCAS	GNCCMP	GRRICC	UNDC	GNUPAP	NMDPF	GH-INDC	NUPF	GADPO
Urban agriculture	0	6	30	2	0	0	3	0	0	0	0	0	0	0
Community gardens	0	0	6	0	0	0	0	0	0	0	0	0	0	0
Community-based garden	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eco-agriculture	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Greenhouse growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Home crop	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydroponic production	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indoor growing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kitchen gardening	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Petty farming	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small-scale agriculture	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban cultivation	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban farm	0	0	4	0	0	0	0	0	0	1	0	0	0	0
Urban small farm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban food production	0	0	2	0	0	0	0	0	0	0	0	0	0	0
Vertical farming	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aeroponic farming	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agricultural urbanism	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agroecology	0	0	0	0	4	0	0	0	0	0	6	0	0	1
Agroforestry	4	0	0	0	5	0	3	0	0	0	0	0	0	0
Agronomic	0	4	0	1	2	0	0	0	0	0	1	0	0	0
Aquaponics	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Aquaculture	0	5	8	1	28	0	0	0	0	0	42	0	0	8
Rooftop farming	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Backyard farming	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City agriculture	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City farm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City farms	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City farming	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City gardening	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Climate change adaptation	0	0	4	19	0	0	0	0	0	0	3	0	4	0
Climate-controlled farming	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Climate-smart agriculture	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: ASPN = Agriculture Sector Policy Notes (2017); FASDEP II = Food and Agriculture Sector Development Policy II (2007); GNSDF = Ghana National Spatial Development Framework (2015–2035); GNCCP = Ghana National Climate Change Policy (2013); NCSAFSAPG = National Climate-Smart Agriculture and Food Security Action Plan of Ghana (2016–2020); NCCAS = National Climate Change Adaptation Strategy; GNCCMP = Ghana National Climate Change Master Plan (2025–2020); GRRICC = Ghana Roadmap for Resilient Infrastructure in a Changing Climate (2022); UNDC = Updated Nationally Determined Contribution (2020–2030); GNUPAP = Ghana National Urban Policy Action Plan (2012); NMDPF = National Medium-term Development Policy Framework (2021); GH-INDC = Ghana's Intended Nationally Determined Contribution (2015); NUPF = National Urban Policy Framework (2012); GADPO-Phase I-IV = Ghana Agriculture Development Policy Operations: Phase I-IV (2017).

Source: Authors' construct based on policy document analysis.

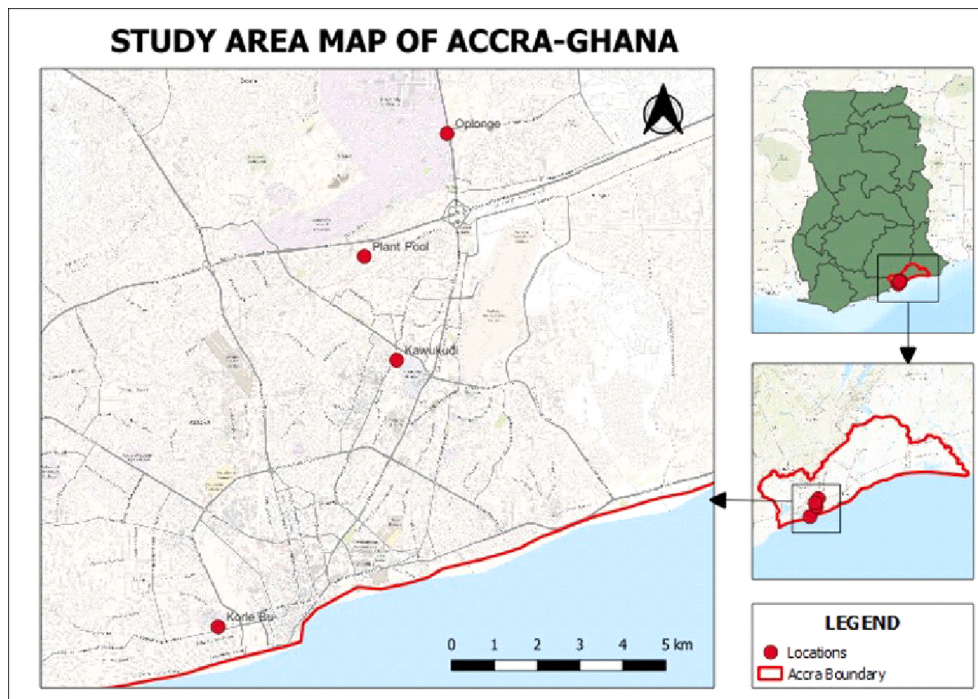


Fig. 1. Map of Ghana showing Accra and the visit sites. Source: Authors' construct.



A



B

Plate 1. Examples of farm sites visited in Accra (A – Korle-Bu site, B – Plant pool site).

February and March, crop yields decline, leading to increased prices and reduced food availability. Urban farmers produce a lot of food, for instance, vegetables to feed us here in the city during the dry season.” (Stakeholder interview 2, July 2024)

This view, echoed by several stakeholders, underscores the critical role of UA in ensuring food security. By promoting UA, especially in small backyard gardens, it is possible to increase food production even during these critical periods, thereby enhancing food security. A stakeholder noted:

“If we promote urban agriculture, like backyard gardening – even in small spaces – with good varieties and proper agricultural practices, don’t you think we could increase production? Production definitely will increase, and this is something we can easily do to enhance local food production.” (Stakeholder interview 4, July 2024).

In addition to enhancing food security, it also emerged that UA contributes to climate resilience by utilizing and managing water resources more effectively. Flooding is a major issue in Accra, and it poses

a significant threat to livelihood, property, and human life. However, it was highlighted that the integration of water management systems within urban agricultural practices can help mitigate this risk. Specifically, by implementing water collection systems in flood-prone areas, excess water can be gathered, treated, and used to support agricultural activities in the city. This not only reduces the vulnerability of urban farms to flooding but also enhances the overall water management infrastructure of the city. As one participant highlighted:

“Accra faces many flooding issues, and if we don’t address them properly, they could negatively impact urban living. Urban agriculture can help manage the flood by storing excess water. But if we don’t manage it well, too many floods can destroy these farms, and the potential benefits will be lost.” (Stakeholder interview 6, July 2024).

This note by a farmer from Plant Pool echoes the theme of water vulnerability and infrastructure inadequacy. Moreover, it came out during the interview that urban agriculture is needed to serve as a protective measure for ecologically sensitive areas within urban

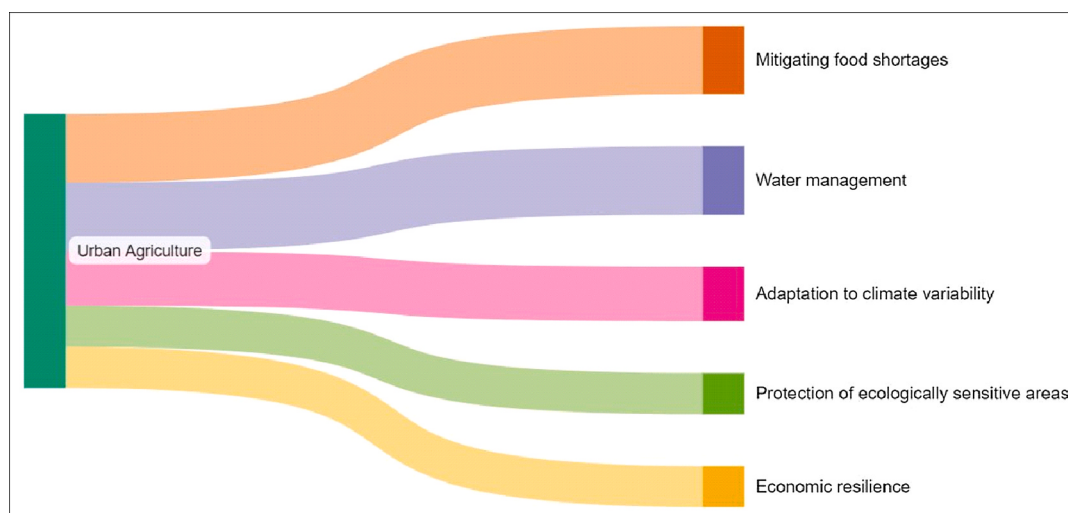


Fig. 2. Stakeholders' perspectives on the role of urban agriculture in building climate resilience in cities of Ghana. Note: the figure illustrates the relative importance of each factor, and the category thickness is based on the number of responses. .
Source: Authors' construct based on interview data

environments in Accra and other cities. A stakeholder made a compelling allusion to the Achimota Forest in Accra, and suggested that:

“Instead of leaving it unused, we could promote urban agriculture there. This would allow it to continue acting as a carbon sink while also generating some revenue through agriculture.” (Stakeholder interview 3, July 2024).

Meanwhile, field visits to the four farm sites confirmed recurring infrastructure and environmental challenges. For instance, at the Plant Pool site, farmers relied on uncovered storm drains for irrigation, raising concerns about contamination. At the Korle Bu site, encroachment by informal structures and poor waste management were evident. None of the sites had formal land tenure agreements or adequate access to municipal extension services. Despite these challenges, however, the farmers demonstrated adaptive strategies such as crop rotation, composting, and informal water harvesting systems.

By integrating urban agriculture into these areas, it is possible to preserve their ecological functions while simultaneously promoting food production and climate resilience. This approach not only safeguards the natural environment but also provides a sustainable source of income for urban residents and growers alike. Many stakeholders share this view. This proactive approach is essential for optimizing agricultural productivity and ensuring the long-term sustainability of urban farming initiatives. Stakeholders also mentioned the critical role of urban agriculture in building economic resilience for growers and sellers. Urban farmers depend on the activity as their main source of livelihood, underscoring its importance in sustaining households. Sellers who buy from the producers also depend on it for their livelihood. This means that a disruption in production activity goes a long way to throw many households into critical financial conditions, suggesting the need for more proactive measures to make it more viable and accessible to people. The limited policy recognition of UA constrains farmers' ability to secure land tenure, attract investment, or receive technical support, thereby reinforcing socio-economic marginalization among low-income producers. This reduces their capacity to contribute meaningfully to city-wide resilience efforts. Fig. 2 shows the emphasis that the stakeholders placed on each point they raised.

4.2. The level of integration of UA into national strategic policy documents

After understanding the role that urban agriculture can play in

building climate resilience, the study investigates further to understand the extent to which national policy documents recognize UA. Key terms related to UA and climate change adaptation were searched across 14 national policy documents. The occurrences were then mapped using a heatmap. The findings reveal a limited engagement of UA and its associated practices in strategic national policy frameworks (see Table 3). “Urban agriculture” as the most relevant term shows minimal integration, appearing in only four policy documents, with the GNSDF recording the highest frequency of 30 occurrences. This is followed by FASDEP II with 6 times and the GNCCP with 3 mentions. FASDEP II recognizes UA as a food security measure and livelihood strategy for the poor: “Urban agriculture is a major component of the livelihood strategies of the urban poor, particularly migrant populations”. It further adds, “Urban agriculture will be promoted as a sustainable alternative means of livelihood for poor migrants engaged in it. The needs and capabilities of different categories of farmers for diversification will be identified for appropriate targeting.” GNSDF stressed the prominence of UA in Ghanaian cities, and the need to champion it. It states, “Urban agriculture is already popular in Ghana, particularly in the larger cities. For example, there are up to 1,000 vegetable farmers in Accra, Ashaiman, and Tema that are growing exotic vegetables like lettuce, cabbage, spring onions and cauliflower as well as traditional ones like tomatoes, okra, ayoyo, aubergine and hot pepper”. The document further highlights: “Urban agriculture programs should be established to reduce barriers to urban agriculture including access to land, soil, and water, as well as funding for development and administrative infrastructure. Examples of programs include donating or leasing vacant land to land trusts for community gardens, free shipments of compost to gardens, and discounted rates on municipal water. Priority should be given to disadvantaged communities. New development projects should be encouraged to include urban agriculture land.” Meanwhile, GNCCP presents an approach meant to restore peace between urban and peri-urban growers and communities. The document states: “Prepare and enforce spatial plans to address conflicts between peri-urban agriculture and human settlements”. Interestingly, none of these documents projects UA as a key strategy for building climate resilience. Although there are acknowledgements for its promotion, they lack clear visions on how it can be done across cities in Ghana. Clearly, although UA has been recognized in a few national policies, its integration into major strategic national policy documents remains marginal.

Other terms such as “community gardens,” “urban food production,” and “urban farm,” appear sparingly, with a few mentions across a few

policy documents. While “urban farm” is mentioned four times in the GNSDF, “urban food production” is referenced twice. Observably, innovative urban farming techniques, including “vertical farming,” “aeroponic farming,” and “hydroponics,” are entirely missing across all policy documents. This omission underscores the narrow scope through which Ghana’s national policy frameworks conceptualize UA, which is largely about traditional practices. In contrast, however, the analysis shows a stronger emphasis on aquaculture and agroforestry. Aquaculture features in NMDPF 42 mentions, 28 times in NCSAFSAPG, and 8 times each in GADPO and GNSDF. Similarly, agroforestry registers frequently in the NCSAFSAPG, GNCCMP, and ASPN with five, three and four mentions, respectively. Notably, these mentions have little to do with urban areas, their food systems and climate resilience. These findings suggest that Ghana’s national policies lean toward traditional, large-scale cultivation as the main areas for food security and climate resilience, undermining the potential of UA practices in enhancing food security.

Another discerning observation is “climate change adaptation,” which appears in a few documents. The GNCCP and GNSDF show some level of engagement with climate adaptation, underscoring Ghana’s commitment to addressing climate change impacts through an array of agricultural and environmental strategies. Nonetheless, the absence of key terms like “climate-smart agriculture” and “urban agriculture” shows that while climate adaptation is well recognized, interventions that are tailored to cities and food systems are yet to be given the needed priority in the national policy agenda. The complete omission of terms like “vertical farming,” “aeroponic farming,” “rooftop farming,” and “hydroponics” across all policy documents is concerning, given the potential of these innovative techniques to make urban agriculture more viable in addressing urban food security challenges and as a potential climate resilience strategy. In the developed world, these innovations characterize the UA landscape because of their role in maximizing limited urban space and addressing food security in densely populated areas. Their absence, therefore, suggests a missed opportunity for Ghana to embrace the full potential of modern, climate-resilient urban farming techniques. The findings underlie major gaps in the recognition and integration of UA practices and techniques in the wake of rapid urbanization, heightened climatic impacts, and pressing need for sustainable food systems in cities, particularly in the Global South. Next, we will look at some of the challenges that policymakers face in integrating UA and climate-resilient strategies into national policies.

4.3. Challenges in integrating UA into national policies in Ghana

To ascertain why UA has limited recognition and integration as a climate resilience strategy in key national policy frameworks, the study interviewed stakeholders, including policymakers, academics, and practitioners, among others, to unravel the challenges to effective policy integration. The interview revealed a recurring issue of weak regulatory and implementation frameworks (Fig. 3). All policymakers alluded to the fact that there exists some level of integration in a few policy documents (FASDEP II was widely mentioned), but enforcement remains the biggest challenge. Technical staff who are at the helm of affairs in policy development expressed concern and dissatisfaction at the rate at which their efforts always go down the drain. There was a clear sense of demotivation because of structural inefficiencies. Respondents lamented:

“Most of the schemes that are developed will have components for urban agriculture. But when it comes to the implementation, it’s very difficult, stopping encroachment.” (Stakeholder interview 7, July 2024).

“I would say it’s not that we are not giving priority. It’s just that it ends up not being implemented. We have it somewhere in the FAS-DEP document. Trust me, the issue has been the implementation”. (Stakeholder interview 8, July 2024).

“In this country, one of our biggest problems is implementation. And it is not that we don’t know.” (Stakeholder interview 13, July 2024).

This underscores an endemic and enshrined practice where policies are seen as mere slogans with no programmatic actions. Policy experts were particularly unhappy with how politicians have infiltrated key institutions that are mandated to take leading roles in championing UA. It strongly emerged through the interviews that politicians often pre-occupy themselves with short-term economic gains over the long-term sustainability prospects of cities. As such, strategic visions that align with green urbanism and climate resilience continually receive minimal policy attention. A respondent highlighted:

“You give your technical advice, but when decisions are made, they often focus on short-term economic and political gains.” (Stakeholder interview 15, July 2024).

This was echoed by almost all the stakeholders who were interviewed. Meanwhile, it emerged that UA-designated sites are continually

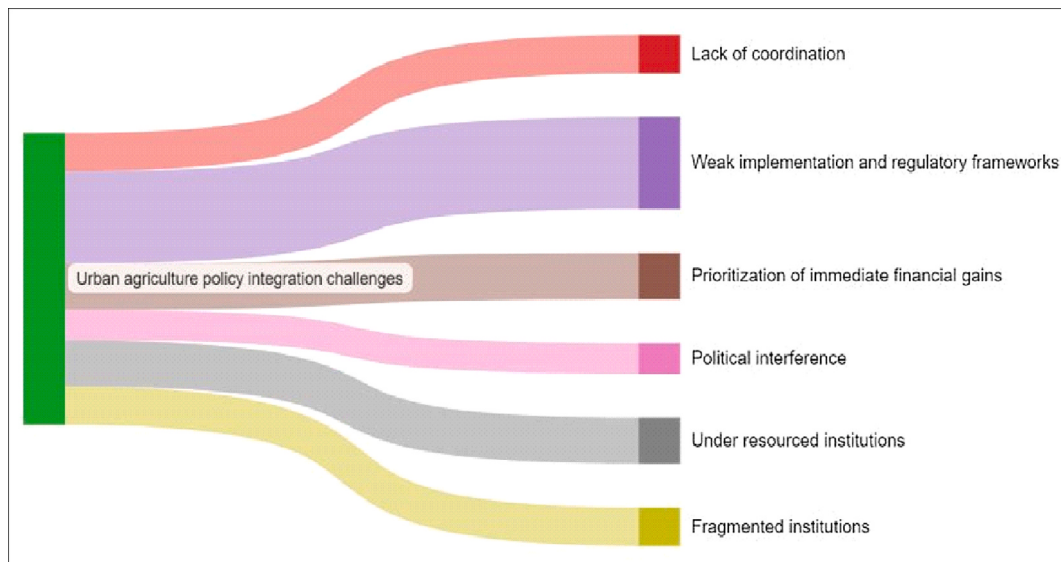


Fig. 3. Stakeholders’ perspectives on the challenges of integrating UA as a climate resilience strategy into strategic national policy frameworks in Ghana. Note: the figure illustrates the relative importance of each factor, and the category thickness is based on the number of responses. .

Source: Authors’ construct based on interview data

encroached on and sold to real estate companies for property development. Sadly, traditional leaders who happen to be the custodians of most lands in Accra and other cities in Ghana see little value in UA. To them, it is better to turn available lands into something that is economically gainful and viable than to preserve them for agricultural purposes. As such, lands in prime areas are highly valued and continue to receive pressure from real estate developers. The interview revealed that chiefs always take a leading role in selling designated lands, especially those in prime areas, for lucrative physical developments. Moreover, the need for District Assemblies to increase revenue for local development purposes adds another layer of neglect. Assemblies, just like chiefs, prefer developments that offer higher economic prospects than UA practices. A respondent reported:

“Metropolitan and District Assemblies are often caught between choosing between economic gains and preservation of green spaces. If you are an assembly and you have these two scenarios, what would you do? Obviously, they will go in for the one who is coming to build that estate.” (Stakeholder interview 1, July 2024).

The economic incentives continue to dictate what direction urban land use should take. The current practices strikingly disadvantage UA, and there is no sense of hope that things will change in the near future. The intentional and repeated bias against UA limits the availability of land for such projects, undermining efforts to integrate it into national policies. This echoes a larger societal problem in Ghana, which is the lack of awareness about the usefulness of UA. The problem is compounded by the lack of coordination among relevant institutions. It was made known that institutions do not share information, and this often leads to fragmentation and duplication of efforts. Although many organizations, such as civil society groups, non-governmental organizations, and government institutions (e.g., Ministry of Food and Agriculture) work in the space of agriculture, climate change, and food systems, they do not engage with each other as far as their operational activities are concerned. This is also the case even in the national institutional settings. The current situation stifles efforts to have a broader view of what is happening and what can be done in the policymaking space. A respondent commented:

“CSOs, NGOs don’t share their information with government institutions... Even the so-called international NGOs, country-specific NGOs, are not sharing information.” (Stakeholder interview 17, July 2024).

Notably, the lack of transparency and collaboration undermines not only the ability of government institutions to have a better picture of ongoing UA programmes and initiatives but also the critical stakeholder perspectives that can inform appropriate policy actions. Importantly, the absence of a structured coordination between spatial planning and development planning is particularly worrying. The National Development Planning Commission (NDPC) leads the broader strategic national development plans involving all sectors of the economy. However, there is often a disconnect between the development plans and the actual spatial requirements for UA practices in various cities. A policymaker noted:

“The district assembly prepares their medium-term development plans with little focus on urban agriculture. Sadly, they don’t consider the land requirements as part of what should be done.” (Stakeholder interview 10, July 2024).

This disconnect in planning undermines the relevance of UA, partly explaining why it is not given the needed attention in policy frameworks. In essence, the existing institutional frameworks present significant hurdles to seemingly integrating UA into strategic national policy frameworks. The decentralized system continues to create an inefficient system with regional offices of national institutions, for instance, lacking the capacity to monitor district-level activities because the district, although under the region, reports to district officers. This has created a

complex dual system that continues to weaken regional offices to effectively and consistently enforce policy implementation. The situation, it emerged, is exacerbated by bureaucracy and resource constraints, especially within the planning settings. The Land Use and Spatial Planning Authority (LUSPA) continues to struggle with inadequate resources and competing priorities, with UA always at the disadvantaged end. One stakeholder explained:

“Even as an institution, when we submit a budget, it doesn’t mean we get everything we need. When funds do come in, we have to prioritize. Do you think urban agriculture will become a priority when it comes to infrastructure development?” (Stakeholder interview 20, July 2024).

This statement underlies a broader institutional challenge of resource allocation, where UA is never an option for prioritization. This partly explains why UA is minimally recognized and integrated into policy frameworks. Fig. 2 illustrates the level of emphasis that the respondents placed on barriers identified in this research.

5. Discussion

The findings portray UA as an underutilized strategy for building urban and climate resilience in Ghana. The identified barriers to effective integration within national policies exhibit complexity, shaped by institutional, economic, and environmental challenges. Meanwhile, the policy neglect of UA in Accra mirrors trends in other African cities such as Lagos and Nairobi, where informal farming thrives but remains unrecognized in formal planning [58]. Conversely, cities like Dakar and Kampala have begun to institutionalize UA through local ordinances and urban food strategies [59], demonstrating potential pathways for Accra. In this discussion, we will explore these challenges and potential pathways for policy reform.

5.1. UA as a climate resilience tool

The weak planning and management frameworks that underlie many cities in the developing world make them increasingly vulnerable to climate-induced hazards. Cities in Ghana, particularly Accra, are vulnerable and continue to experience climate-induced events, such as flooding and unbearable heat waves [60,61]. Climate resilience, therefore, remains a critical challenge for Ghana. The findings highlight the potential of urban agriculture to enhance urban resilience, especially in its capacity to absorb and manage excess water during floods and enhance food security, resonating with a recent study that highlights the role of urban greenery in building resilience [62]. UA can be integrated into flood-prone areas to capture rainwater, helping mitigate floods while providing irrigation for crops [63]. This dual benefit positions UA as a cost-effective nature-based solution for climate adaptation, aligning with Ghana’s National Climate Change Policy that promotes nature-based solutions. However, Ghana is yet to fully recognize these potentials as demonstrated by the little attention that UA has received in strategic policy documents. This is not the case in other contexts where there is conscious recognition and integration of UA into key national policies. Countries like Kenya, Rwanda and South Africa have taken a leading role in recognizing the climate-resilience potential of UA. These countries have integrated UA into national policy frameworks. For instance, Kenya has introduced UA in its planning and climate adaptation strategy for promoting urban greenery and food systems [37]. Ghana has the opportunity to learn from these countries. A potential avenue for policy reform for the country could entail partnering with environmental organizations to pilot flood-resilient urban farms, particularly in vulnerable neighborhoods in Accra. The Ministry of Food and Agriculture (MOFA) and the Accra Metropolitan Assembly must, as a matter of urgency, work together to promote UA-related activities. Activities such as urban farm clubs could go a long way to create the needed awareness among the general populace and policymakers,

thereby projecting UA as a force to reckon with. Additionally, adopting more climate-resilient practices, such as planting drought-resistant and indigenous crop varieties could help urban growers sustain production during dry seasons, thereby reducing food price volatility and increasing urban food security.

5.2. Policy integration gaps

The results reveal a lack of policy integrations across key policy documents and frameworks on food security and climate change risks in Ghana. This is concerning and could be partly attributed to little awareness among politicians who are always preoccupied with immediate political gains. This finding is supported by a recent analysis that notes that UA integration into policies is underwhelmingly minimal, necessitating the need for a targeted policy framework to support and incentivize growers [38]. The seeming little attention of UA in national policies in Ghana reflects a broader challenge in Sub-Saharan Africa, where agriculture policies traditionally favour rural production systems over urban food systems [64,65]. Ghana's case mimics this rural–urban policy dichotomy, where UA with its strong potential in enhancing food security and resilience, is neglected. Similar findings have been reported in South Africa, where policy fragmentation, limited institutional support, and resource constraints are noted to undermine the effectiveness of UA [66]. Ghana's limited UA policy integration reflects power imbalances and historical legacies. Power and inequality manifest in elite control over urban land, where commercial developers are prioritized over farmers. Historical and material context reveals how colonial land policies, which favored urban expansion, and post-independence commercialization constrained UA's growth [36]. Elsewhere in Kenya, however, there is a strong push to incorporate UA into urban planning as part of climate adaptation policies. Antwi-Agyei et al. [56] observed weak integration of climate information into national policy documents across Anglophone West African countries. Kenya's government recognizes the role of urban food production in building community resilience [67]. Ghana must be intentional with its policy instruments, mandating local governments to include urban agriculture in city plans and allocate specific zones for community gardens and commercial urban farms. A key recommendation is the adoption of zoning reforms to formally designate 'Urban Agriculture Zones' (UAZs) within city master plans, especially in *peri*-urban and flood-prone areas where UA is already practiced. Municipalities could work with traditional authorities to secure land use rights for such zones. Additionally, a municipal funding scheme (e.g., microcredit) targeted at urban growers, and administered through the Accra Metropolitan Assembly or in partnership with the scheme providers, could enhance farmers' access to inputs, tools, and technologies. Civil society organizations could complement this by providing training in sustainable farming practices and market access support.

For Ghanaian cities to be self-sufficient, UA has to be prioritized and vigorously promoted using various mediums such as schools, social media, radio and community programmes. Implementing UA policies within the country's urban development agenda could lay a strong foundation for piloting sustainable practices such as aquaponics, hydroponics, and rooftop gardening, which require minimal space but are characterized by high-yield productivity. Including these innovative techniques within policy frameworks would foster sustainable urban food systems and close alignment to SDG 11 (sustainable cities and communities), ultimately helping Ghana to effectively manage vacant urban spaces while promoting greenery and enhancing climate and food resilience. This calls for greater collaboration amongst state agencies, including the Ministry of Food and Agriculture, the Ministry of Science, Environment, Technology and Innovation, and the Environmental Protection Agency, to champion efforts aimed at creating greater awareness of the benefits of UA for addressing climate change risks and food security challenges.

5.3. Weak institutional coordination and governance system

The study identified a lack of coordination as a major barrier to the mainstreaming of UA. This is a major factor undermining efforts at addressing climate change and livelihood challenges in Ghana. This finding resonates with previous studies by Antwi-Agyei et al. (2018), highlighting inadequate coordination among key institutions mandated to address climate change as one of the key barriers to addressing climate change risks in Ghana. Similarly, Puppim de Oliveira and Abubakari [31] observe a polarized governance structure characterizing UA activity, particularly in Accra. Institutional fragmentation in Ghana stems from overlapping mandates among ministries and agencies (e.g., agriculture, local government, urban planning), limited inter-agency coordination, and bureaucratic inefficiencies that delay implementation. This is a reflection of historical governance patterns rooted in colonial administrative silos. This often results in policy silos where urban food systems are deprioritized. Weak institutional coordination and governance systems stem from power dynamics, undermining the importance of collaboration and partnership in the development process. Collaboration and partnerships are critical for resource mobilization, innovation [68], and capacity building [69]. Ghana needs to leverage these to propel innovation in its governance system. Working across stakeholders in key sectors is not only critical for the cross-fertilization of ideas but also for building effective governance systems in nation-building. The current practice presents a system that is inefficient and shrouded in secrecy. Such a system cannot be accountable, underscoring the high levels of inefficiency in the sector. Ghana's disjointed approach contrasts with cities that have successfully implemented UA policies through strong inter-agency collaboration and public–private partnerships. For instance, São Paulo, Brazil, has developed key partnerships with local businesses, NGOs, and community groups to promote sustainable food production. Initiatives such as urban gardens, school gardens, and local food markets support programmes have been instrumental in strengthening food systems. UA is expressed in São Paulo as activism and income generation opportunity [70]. Similarly, in the US, local government partnerships with NGOs and urban farms have led to the development of Detroit's Agricultural Ordinance, which provides legal protection and resources for urban farms across the city [71,72]. Participatory approaches, such as São Paulo's inter-agency partnerships [70], could inspire Ghana to establish an Urban Agriculture Taskforce involving farmers and traditional leaders to enhance inclusivity. Establishing a formal coordination mechanism – Urban Agriculture Taskforce – could improve inter-agency collaboration and policy coherence. This could facilitate regular communication among government agencies, NGOs, and private sector stakeholders to streamline information sharing, thereby avoiding redundant efforts. Importantly, policy reforms that explicitly integrate UA into Ghana's decentralization framework have the potential to encourage district assemblies to incorporate urban agriculture into their spatial and development planning, aligning UA initiatives with local urban resilience objectives. Thus, by intentionally institutionalizing UA as part of city planning, Ghana can foster a more cohesive and supportive environment for UA practices across its cities.

6. Conclusion

This study has highlighted the critical, yet underutilized, role of UA in building climate resilience in Ghana. The results from stakeholder interviews and farm observation show that UA holds significant promise for enhancing climate resilience by increasing food security during critical periods, improving water management, and protecting ecologically sensitive areas. This is critical for a country projected to experience increasing temperatures and erratic rainfall patterns in the coming years. However, the analyses show that despite its potential, UA remains barely integrated into strategic national policy documents and frameworks addressing food security challenges and climate change risks.

Factors, including weak coordination and institutional fragmentation, economic pressures, unnecessary political interference, and resource constraints underline this. The results underscore the need to address existing barriers by shifting the current orientation of how UA is perceived and integrated into national policy frameworks. In doing this, this paper proposes the following. There is a need for policymakers in Ghana to consider adopting a more coordinated, multi-stakeholder approach that aligns UA with climate adaptation and resilience-building strategies. Additionally, raising awareness among key stakeholders about the long-term benefits of UA is critical to overcoming the current focus on short-term economic gains. Addressing these challenges is essential for realizing the full potential of UA in contributing to Ghana's sustainable development goals, especially goal 11 (sustainable cities and communities). The findings suggest that promoting inter-agency collaboration through platforms like an Urban Agriculture Task Force would be critical in enabling better resource allocation and planning coordination, thereby ensuring that UA is prioritized within Ghana's urban development policies. To this end, conscious policy effort is needed to establish and protect designated urban agricultural zones from encroachment while encouraging innovative practices such as hydroponics and vertical farming that make efficient use of limited space. By integrating UA into national resilience and development policies, Ghana has the opportunity to transform its cities into sustainable food system hubs. The greenery would not only help in controlling urban floods, but also reduce heat, thereby making cities more liveable and resilient. Thus, promoting UA as a core climate resilience strategy holds promise for yielding long-term benefits for food security, environmental conservation, improved urban livelihood, and well-being. For municipal planners, a critical entry point is to revise local development plans to incorporate UA-specific targets, budget lines, and spatial designations. Designating underutilized public lands for UA, offering tax incentives for rooftop or vertical farming initiatives, and establishing local farmers' advisory committees could foster stronger institutional support. For UA advocates, engaging more actively in public consultations and forming strategic alliances with food justice movements and environmental NGOs could help elevate the visibility of urban agriculture in Ghana's policy discourse.

While this study provides valuable insights into the UA-policy nexus in Accra, its findings are limited by its focus on one city and a purposive sample. Broader surveys and cross-city comparisons could offer a more generalizable understanding of how UA could contribute to urban climate change resilience. Future research should explore the effectiveness of emerging UA policies in secondary Ghanaian cities such as Kumasi or Tamale. Additionally, deeper analysis of UA's social impacts, such as nutrition, youth employment, and gender equity, could help expand its framing beyond resilience alone.

CRedit authorship contribution statement

Gideon Baffoe: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Philip Antwi-Agyei:** Writing – review & editing, Writing – original draft, Validation, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgment

We would like to say thank you to all the policymakers and urban

growers who took time off their busy schedules to be interviewed. This paper is produced as part of a project funded through the York Environmental Sustainability Institute (YESI) International Fellows Scheme with support from the Environmental Sustainability at York (ESAY) led by the University of York.

Data availability

No data was used for the research described in the article.

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