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Land Use Planning in Ghana: A Review of Emerging Trends, Prospects, and Challenges

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Abstract
This study presents a systematic literature review on land use planning in Ghana, focusing on emerging trends, prospects, and challenges reported between 2014 and 2024. The objectives were to investigate land use planning challenges and examine its emerging trends and prospects in Ghana. Employing the PRISMA approach, the review analyzed 35 peer-reviewed journal articles retrieved from Google Scholar and ScienceDirect. Emerging trends and prospects in Ghana encompass a focus on climate change issues, benefits for residential areas, and political interest in spatial planning. Notably, chieftaincy institutions play a significant role in land use determination and management. The most documented global trend is the application of technologies, leading to smart land use planning. Key challenges identified include ineffective planning for climate change at sub-district levels, contradictions between planning practices and legislation, and a lack of local citizen engagement. The study concludes that Ghana's land use planning regime requires an overhaul to adopt these emerging trends, particularly the smart land use planning concept from developed countries, for sustainable growth and development. Recommendations for future research include examining the adoption of smart land use planning and artificial intelligence in Ghana.

Keywords
Spatial Planning; Climate Change; Residential Areas; Traditional Authorities; Smart Land Use Planning; Technology Application; Citizen Engagement

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1. Introduction

Land is the spatial bearer of all human life. It changes the socio-political and economic structures of a community by interacting with value within a specific tenure system (Mehari & Genovese, 2023). Cobbinah et al. (2020) avers that land is a valuable resource for the growth of cities as it supports the livelihoods of many people. It is a vital factor of production and wealth development and is likely to account for between half and three-quarters of national wealth across the globe in the future. Therefore, enhancing livelihoods and ensuring the efficient use of land are essential components of any comprehensive plan for reducing poverty and promoting sustainable development. The coordination of investment choices requires land use planning (Cobbinah & Aboagye, 2017). Planning land use is essential to both sustaining the natural environment and satisfying the growing demands of human needs. One of the main areas of research that has not changed is the extent to which environmental changes are influenced by human activity-throughout the order, hence societies have employed land use planning to manage its impact on the environment (Mehari & Genovese, 2023). Land use development coordination is necessary to address the issues of development ineffeciencies since it is difficult to change the use of land once it has been put to use (Kaamah et al. 2023). As a result, several variables (such as socioeconomic, cultural, political, environmental, and demographic) influence different land use planning

strategies and worldwide results (Korah et al. 2017).

Land use development coordination is necessary to address the issues of development ineffeciencies since it is difficult to change the use of land once it has been put to use (Kaamah et al. 2023). Town and country planning, urban planning, regional and city planning, and other activities related to the strategic organization and development of metropolitan areas are all included in the field of spatial planning. Land in both rural and urban areas, as a carrier resource for human economic development, a natural endowment, and an institutional entity that shapes human behavior in socio-political relations through tenure conditions, needs to be effectively planned for long-term, productive use (Mehari & Genovese, 2023). Land use planning is the deliberate steps taken to define the use of land to increase the beauty of an area, foster harmony of competing land uses, encourage accessibility, and enhance the well-being of residents of a specific town (Poku-Boansi & Cobbinah, 2018; Kleemann et al. 2017; and Kuusaana & Eledi, 2015). Land use planning (LUP) is effectively mentioned multiple times as a crucial tool for managing the expansion and orderly growth of human settlements (Kaamah et al. 2023). The development of planning is responsible for the emergence of numerous layers of planning, contextual factors that shape planning, and evolutionary processes that have impacted nature (Zakaria et al., 2024). The spatial arrangement of land usage, regardless of scale, is a tangible representation of how a society's costs and benefits are distributed (Mehari & Genovese, 2023).

The use to which land is put determines the extent to which LUP occurs (Yachori, 2017), through the use of rules and regulations controlling land use planning activities. Therefore, land use planning is often conceptualized as a legal government tool used to manage land in a sustainable, effective, and efficient manner (Sangawongse et al. 2021). Above all, it offers a development strategy that helps avoid conflicts over a piece of land and maintains land as a natural resource for both present and future generations (Sharifi et al. 2014). The development of planning is responsible for the emergence of numerous layers of planning, contextual factors that shape planning, and evolutionary processes that have impacted nature (Zakaria et al., 2024). The spatial arrangement of land usage, regardless of scale, is a tangible representation of how a society's costs and benefits are distributed (Mehari & Genovese, 2023). Many academics believe that planning is crucial to promoting sustainable development and guaranteeing that economic gains are distributed fairly throughout a state's diverse areas. Ghana's planning and land development rules are intricate and multifaceted. Ghana's regional development is geographically diverse, with a notable divide between the country's northern and southern regions. Thorough and multifaceted problem-solving is essential for the effective use of sustainable development solutions. Without land use plans, unplanned settlements and environmental harm would result from irresponsible and unsustainable growth (Cobbinah et al., 2020). According to the findings by Awuah et al. (2014), Ghana's Urban Land Use Plan (ULUP) system is supported by several regulations and produces significant advantages for the nation in line with welfare economic theories. According to Afrane (1993), as seen in Awuah et al. (2014), the idea of land use segregation, which supports nonfunctional land use, discrete zoning, regulation, and consensus, forms the foundation of planning practices. Furthermore, the plan, service, develop, and occupy paradigm is essentially supported by the planning regime. Planning urban land use is still essential to attaining sustainable development in African towns. Its primary goals are to safeguard, restore, and encourage the sustainable use of land (Cobbinah et al., 2020). To this aim, civilizations have utilized land use planning, which has been molded within the framework of correspondingly prevailing development philosophies and ways of thinking (Mehari & Genovese, 2023). The 1950s and 1960s saw the development of structured mathematical models in the field of land use planning, particularly in urban settings, where bid-rent and optimal firm location theories were crucial in conceptualizing the spatial distribution of activities (Mehari & Genovese, 2023).

The body of research on land use planning in the modern period is hegemonically gravitating away from the spatial domain and toward the technical potential of artificial intelligence. This finding is readily supported by the fact that particularly in urban land use planning studies, land use optimization objectives are frequently framed as being generally management-oriented (Mehari & Genovese, 2023). A thorough grasp of previous land development and planning-related events and legislation, and how they have impacted the physical expansion of places, is essential to improving present and future planning strategies (Zakaria et al., 2024). Therefore, this kind of analysis will help address land-related and planning issues in Ghana, a country that, like others, has experienced significant changes in its regulatory framework over time.

By examining its historical basis and critical issues, researchers endeavored to clarify Ghana's planning and land development regulations. A thorough grasp of the history of land development and planning laws, as well as their effects on spatial development, is necessary to improve present and future planning strategies (Zakaria et al., 2024). Undertaking a literature study is a more effective approach to filling in a knowledge gap. Like in any other disciplines, literature reviews are essential to land use planning because they allow researchers to identify present hotspots, trace the evolution of concepts, settings, and methodologies, and create hypotheses about new approaches.

Numerous studies have examined land use planning (Atanga & Inkoom, 2017; Poku-Boansi & Cobbinah, 2018; Kleemann et al. 2017; Kuusaana & Eledi, 2015; Poku-Boansi et al. 2021; Korah et al. 2017; Cobbinah et al. 2020; Anaafo & Inkoom, 2016; Cobbinah et al. 2019; Asibey et al. 2022; Cobbinah & Darkwah, 2017; Acheampong & Ibrahim, 2016). Therefore, there is a need to synthesize the findings of these studies to establish the emerging trends, prospects, and challenges of land use planning. This study is, therefore, a systematic review of relevant literature to examine land use planning: emerging trends, prospects, and challenges.

2. Materials and Methods

2.1 Research Approach

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) approach was adopted for the study to ensure that the appropriate processes were followed in the retrieval of relevant literature for the study (Rethlefsen et al., 2021). The adoption of the PRISMA approach ensures that vital procedures such as the screening, data extraction, and synthesis are established to guarantee that reproducible literature is accessed and used for the study to reduce bias to an acceptable limit (Johansen and Thomsen, 2016). The PRISMA approach used for the study concentrated on the content of the retrieved peer-reviewed journals. To this end, retrieved literature on land use planning; emerging trends, prospects, and challenges were used for the study. Studies that captured any narrative on land use planning were selected. Also, academic journals and conference proceedings on land use planning were considered.

2.2 Sources of data and databases accessed

The study depended only on secondary sources of data (information). A comprehensive literature search was conducted to ensure that relevant literature was retrieved to answer the study objectives. The search for relevant literature was guided by the use of specific phrases. The phrases used include "land use planning challenges in Ghana", land use planning emerging trends and prospects in Ghana", "spatial planning challenges in developed countries", "spatial planning emerging trends and prospects in developed countries", "land use planning and technology", and "GIS application for land use planning". The search for relevant literature was limited to the years 2014-2024. The aim is to retrieve current literature that has been published on the subject matter. The databases accessed to retrieve literature were Google Scholar and ScienceDirect based on their broad coverage of the literature on the subject of land use planning.

2.2.1 Exclusion and Inclusion Criteria

The selection of relevant literature for the study was underpinned by specific criteria. For the exclusion criteria, books, chapters of books, Thesis, Dissertations, and reviewed literature were excluded. Generally, peer-reviewed journals that did not specifically capture land use planning; emerging trends, prospects, and challenges were also removed after the screening of the title of each journal. For the inclusion criteria, primary research carried out on land use planning was included, studies on land use planning conducted in the English Language, studies with the listed author(s), studies published between 2014 and 2024, and conference proceedings on land use planning were included. The initial search from Google Scholar and ScienceDirect revealed 350 potentially relevant documents. The list was reduced to 55 after the removal of duplicate documents and exclusion based on irrelevant titles, and the abstracts. These 55 articles were then subjected to full-text reading and then 20 were removed leaving 35 articles that met the inclusion criteria for systematic review (Figure 2.1).

2.2.2 Selection of Publications

After the literature search from the databases and the search engines that were used, all the retrieved relevant literature was compiled into a single file. A quick scan of all the retrieved literature was done. Following that, duplicate literature, books, chapters of a books, Theses, dissertations, and review academic journals were excluded. Generally, academic journals that did not specifically capture land governance and land use planning; emerging trends, prospects, and challenges were also removed after the screening of the title of each journal. Again, the abstract of each piece of literature was read to identify and include literature that was related to land use planning; emerging trends, prospects, and challenges.

2.3 Search findings and study selections

The outcomes of the databases (Google Scholar and ScienceDirect) and search engine (Google PDF Search) established about 350 academic journals that were published between the years 2014 and 2024. The process followed in selecting the final set of academic journals based on the eligibility criteria used in Figure 2.1 below. A final list of 35 studies met the eligibility criteria discussed in section 2.1 above (refer to Table 2.1 in Appendix One).

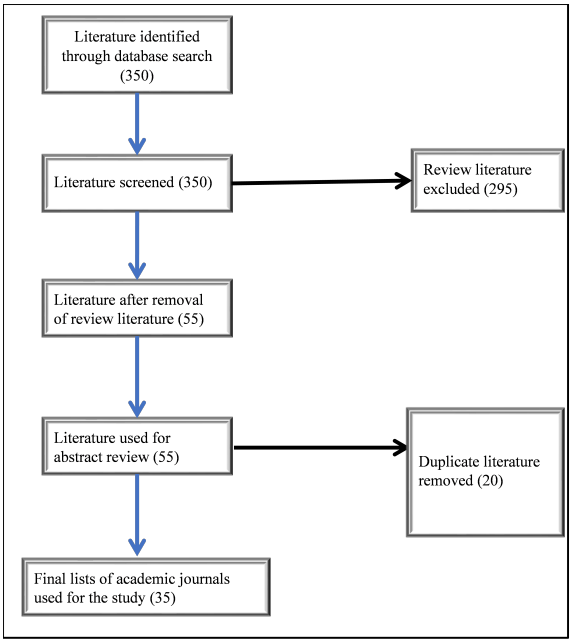

Figure 1. PRISMA flow diagram of the study

3. Results

3.1 Examining land use planning emerging trends and prospects

About seven (7) studies (Cobbinah & N-yanbini, 2019; Awuah et al. 2014; Ibrahim & Siiba, 2020; Siiba et al. 2018; Boamah & Amoako, 2020; Nunbogu et al. 2018) out of 35 identified pieces of literature reported on land use planning trends and prospects in Ghana whereas other studies reported on similar cases in other countries, both developing and developed (Xu et al. 2019; Kaamah et al. 2023; Sangawongse et al. 2021; Soria-Lara et al. 2015; Revington & Wray, 2022; BenDor et al. 2017; Sharifi et al. 2014; Oliveira et al. 2019; Mockrin et al. 2018; Kang et al. 2013; Mustafaa et al. 2018; Zhang et al. 2018; Bai et al. 2018). These identified trends and prospects in Ghana include land use planning focusing on climate change issues, residential areas benefiting immensely from land use planning activities and a high level of compliance with land use plans among the elite class, etc. (refer to Table 3.1). However, the dominant emerging trends and prospects of land use planning in Ghana include state land agencies and customary authorities being sovereign keepers of statutory and customary land and planning laws, as reported by two (2) studies (see Boamah & Amoako, 2020; Siiba et al., 2018).

However, each of the studies reported on the remaining trends and prospects of land use planning in Ghana (refer to Table 3.1). The most documented trend and prospects of land use planning are state land agencies and customary authorities being independent keepers of statutory and customary land and planning laws. Generally, land use plans are implemented by landowners and governed by either the state or traditional authorities. This is a step in the right direction for land use since they are vital for determining the pattern of land use. The cross-cutting issue is that chieftaincy institutions perform key land use planning functions in the form of land use determination and management. This is not surprising since they are custodians of about 80% of lands across Ghana and hence influence zoning regulations. Similarly, some of the reported land use planning emerging trends and prospects in other countries include participatory land use planning is effective for the land use plan preparation process, initiation, and approval, spatial planning observation maps are exceptional tools for land use planning purposes, land use planning approaches are effective in controlling student housing development patterns, and ecosystem service information improve the preparation of specific land use plan for policy implementation purposes. Most documented emerging trends and prospects include the application of technology for land use planning. These studies highlighted the importance of using technologies such as Geographic Information Systems (GIS) and Global Positioning System (GPS) to expedite land use planning activities. The implication is that the use or application of technology for land use planning makes the planning process effective and efficient. However, the second most dominant emerging trends and prospects include participatory land use planning which is effective for land use planning activities (Kaamah et al. 2023; Sangawongse et al. 2021). Consequently, land use plans address the pressing needs of beneficiaries since their needs are considered in prepared land use plans. The reason is that key stakeholders are engaged in the plan initiation process, preparation, and approval. Hence, the final approved plans are accepted as their own resulting in a high compliance rate.

Table 1. Land use planning emerging trends and prospects

Types of emerging trends and prospects	References
Land use planning focuses on climate change issues at the local level.	Cobbinah & N-yanbini (2019) ; Xu et al. (2019)
Residential areas benefit immensely from land-use plans	Awuah et al. (2014)
High level of compliance to land use plans among the elite class	Awuah et al. (2014)
Major political parties have shown interest in promoting spatial planning activities in Ghana.	Ibrahim & Siiba (2020)
State land agencies and customary authorities are sovereign keepers of statutory and customary land and planning laws.	Boamah & Amoako (2020)
Chieftaincy institution play their function as custodians of land in addition to performing land use planning functions such as land use determination and management.	Siiba et al. (2018) ; Boamah & Amoako (2020)
The land self-governance mechanism has the propensity to support communal collaboration and consensus building during land use planning.	Nunbogu et al. (2018)
Participatory land use planning is effective for land use planning purposes.	Kaamah et al. (2023) ; Sangawongse et al. (2021)
Spatial planning observation maps are exceptional tools for planning purposes.	Soria-Lara et al. (2015)
Land use planning approaches are effective in controlling student housing development patterns.	Revington & Wray (2022)
Ecosystem service information improves the preparation of specific land use plans for policy implementation purposes.	BenDor et al. (2017)
Spatial planning instruments are essential for farmland conservation	Oliveira et al. (2019)
Land use planning has the potential to reduce home fire outbreak	Mockrin et al. (2018)
Spatial planning policy has the propensity to mitigate the havoc wrecked by urban flooding.	Mustafaa et al. (2018)
Land use pattern distribution leads to a reduction in transport-related carbon emissions.	Zhang et al. (2018)
The addition of ecosystem service in spatial planning resulted in terrestrial habitat protection.	Bai et al. (2018)
The use of digital tools has made land use planning effective and efficient in terms of the storage and sharing of geospatial data and the GIS-based model is good for the estimation of natural disasters such as floods and landslides during land use planning.	Liu & Li, (2016); Zolkafli et al. (2017) ; Huggins (2018) ; Russo et al. (2018) ; Jahantigh et al. (2019) Roccati et al. (2021) ; Hersperger et al. (2022)

Source: Author's Construct, 2024

3.2 Investigating Land Use Planning Challenges

Out of the 35 identified relevant literature used for the study, 12 (Atanga & Inkoom, 2017; Poku-Boansi & Cobbinah, 2018; Kleemann et al. 2017; Kuusaana & Eledi, 2015; Poku-Boansi et al. 2021; Korah et al. 2017, Cobbinah et al. 2020; Anaafo & Inkoom, 2016; Cobbinah et al. 2019; Asibey et al. 2022; Cobbinah & Darkwah, 2017; Acheampong & Ibrahim, 2016) reported on the land use planning challenges in Ghana whereas two (2) studies reported on land use planning challenges in Nigeria (Enoguanbhor et al. 2021) and Scotland (Peskett et al. 2023).The identified land use planning challenges in Ghana include ineffective planning for climate change initiatives at the district and sub-district levels, planning practices contradicting land use planning legislations, lack of engagement in the planning process by local citizens, etc. (refer to Table 3.2). Most (4) of the studies reported on the non-involvement of the local people in planning activities at the district and sub-district levels across Ghana (see Kleemann et al. 2017; Kuusaana & Eledi, 2015; Poku-Boansi et al. 2021; Korah et al. 2017). However, one study each reported on the other identified land use planning challenges in Ghana (refer to Table 3.2). Thus, in Ghana, the inability of beneficiaries to get involved in the planning process is documented by most of the identified studies as the dominant land use planning challenge across Ghana. Consequently, land use plans often fail to address the pressing needs of beneficiaries since their needs are often ignored or not considered in prepared land use plans. Just like in Ghana, the poor executions of prepared land use plans are caused by inadequate funding, absence of political commitment, corruption, and political interference among others resulting in ineffective land use planning practices for urban and ecological sustainability (see Enoguanbhor et al. 2021; Peskett et al. 2023). The implication is that both developed and developing countries are challenged with the lack of political commitment and political interference in land use planning practices on the part of politicians as well as systemic corruption is affecting the land use planning activities. This means that politicians have the propensity to negatively affect, land use planning activities.

Table 2. Land use planning challenges

Types of land use planning challenges	References
Ineffective planning for climate change initiatives at the district and sub-district levels due to no structures to facilitate the mainstreaming process	Atanga & Inkoom (2017)
Land use planning practices contradict the legislation.	Poku-Boansi & Cobbinah (2018)
Lack of engagement in the planning process by local citizens	Kleemann et al. (2017) ; Kuusaana & Eledi (2015) ; Poku-Boansi et al. (2021) ; Korah et al. (2017)
Vague legislative planning frameworks coupled with the non-recognition of customary ownership of land in the planning process	Cobbinah et al. (2020)
Physical planning activities in Ghana are not based on a long-term sustainable development agenda.	Anaafo & Inkoom (2016)
Lack of clear policy framework and focus on climate change issues in urban land use planning practices	Cobbinah et al. (2019)
Urban land use planning activities are reactionary and less efficient in building resilient capacities to climate change impacts.	Asibey et al. (2022)
Land use planning practices are dictated by individuals with little or no background in planning resulting in poorly planned Ghanaian Cities.	Cobbinah & Darkwah (2017)
Lack of strategic planning, ineffective institutional structures, and inadequate funding for land use planning activities affect the new hierarchical planning system.	Acheampong & Ibrahim (2016)
Poor execution of land use plans (caused by inadequate funding, absence of political commitment, corruption, etc.) has affected land use planning for urban and ecological sustainability.	Enoguanbhor et al. (2021) ; Peskett et al. (2023)

Source: Author's Construct, 2024

4. Discussion

4.1 Examining land use planning emerging trends, and prospects

4.1.1 Influence of chieftaincy institutions on land use planning functions

In Ghana, land use planning is a legal regulatory tool to regulate land use towards ensuring the judicious use of land amidst land scarcity due to rapid urbanization, etc. (Siiba et al. 2018). Therefore, Osumanu (2023) argued that an established set of guidelines that regulate spatial planning is essential to ensure the judicious use of land. Amidst the challenges of land use planning that are discussed in the preceding section lies some emerging trends and prospects as revealed by the review conducted (Cobbinah & N-yanbini, 2019; Awuah et al. 2014; Awuah et al. 2014; Ibrahim & Siiba, 2020; Boamah & Amoako, 2020; Siiba et al. 2018; Nunbogu et al. 2018). The most documented emerging trend and prospect is chieftaincy institutions play their role as custodians of land in addition to performing land use planning function as a vital institution concerning land use determination and management (see Siiba et al. 2018; Boamah & Amoako, 2020).

According to Kuusaana et al. (2013), state lands are acquired through eminent domain authority whereas chiefs, tendamba, clans, and households own and govern customary lands. In some societies, land governance falls under the authority of chiefs, and chief priests as is the case in the northern part of Ghana. In most communities in the southern part of Ghana, sub-chiefs or Paramount Chiefs are responsible for the governance of lands. Generally, in Ghana, large (80%) parcels of land are under the ownership and control of traditional authorities and are administered based on customary land tenure arrangements. It is worth noting that state institutions operate alongside traditional institutions when it comes to land governance in Ghana (Akaateba, 2019). Therefore, the involvement of traditional authorities in land use planning, particularly the allocation of lands for developmental purposes, to a large extent, will make land use planning proactive across Ghana. This is because about 80% of land use plans are implemented on customary lands (Anaafo & Inkoom, 2016; Siiba et al., 2018; Boamah & Amoako, 2020).

Therefore, the involvement of traditional authorities (Chieftaincy Institutions) during the zoning of an area into various land uses will ensure the judicious use of the parcel of land. This is because the chief or traditional authority in charge of a particular piece of land has a major say in what the land is about to be used for or is intended to be used for. According to Siiba et al. (2018), chiefs often give out parcels of land for developmental purposes without taking into consideration land use plans. Their justification is that they are the custodians of the land and hence can determine the use to which the land should be put. However, the chiefs' involvement in the zoning process will ensure that giving out a parcel of land for a particular use will conform to the zoning regulations of the specific area. Similarly, Boamah and Amoako

(2020) argued that traditional authorities in recent times perceive themselves as sovereign keepers of planning regulations since the final decision to give out a parcel of land for development depends on them. The accessibility to land in Ghana is mainly through customary institutions (see Kuusaana et al. 2013; Nara et al.2021; Kidido & Ajabuin, 2023). Chiefs administer lands based on customs and traditions that are exclusive to a particular traditional area (Nara et al. 2021). Kuusaana et al. (2013) argued that the customs and traditions, that are used to administer lands have been in existence for many years. This is based on the traditional belief that land belongs to the clan, which many die with, few remain alive, and the generations yet unborn. To this end, the apportioning of vacant lands to developers, the addressing of land disputes, and putting into practice, the customs and traditions governing lands are all the duties of traditional institutions across Ghana (Kidido & Ajabuin, 2023).

Drawing on the findings of the other countries, it is seen that participatory land planning is key for ensuring the successful preparation and implementation of land use plans. In that regard, as chiefs also play a significant role in land use planning in Ghana, it is essential for planning to actively involve them in the planning processes. Even though the land use planning process in Ghana makes provision for their consultation, it would be more beneficial if they were involved in the entire planning process, as suggested in the conventional literature. This could go a long way in creating an environment for dialogue and co-learning between planners and the chiefs, resulting in a higher percentage of successful land use plan implementation and reduced conflict between the two parties.

4.1.2 Influence of political class on land use planning

Another major emerging trend and hence prospect is major political parties showing interest in promoting spatial planning activities in Ghana (Ibrahim & Siiba, 2020). There are several ways in which the political class affects land use planning. These include the interaction of institutional players, class dynamics, and political ideologies. It is also known that urban planning activities are governed and dictated by the political elites (Cobbinah et al., 2019). Hence, they have the power to support or impede sustainable development. In Ghana, political parties influence land use planning activities to a large extent in the form of funding, provisions of logistics, etc., to expedite land use planning activities. It comes as good news for land use planning as the trend suggests an interest by politicians in promoting spatial planning activities in Ghana. Thus, when these major political parties eventually come into power, they can easily prioritize planning activities in the form of national policies and support planning authorities with the necessary resources required to perform their core mandate effectively. The major political parties showing interest in land use planning activities imply that measures will be put in place to support planning institutions and authorities to perform their roles effectively. However, since it is known that politics can favor or go against planning, it will be key for planning to draw on more scientific approaches and data, and emerging technologies, such as GIS and Remote sensing, as adopted in other countries, to strengthen land use decisions. This will be helpful in either counteracting political pressures or as a means to convince politicians to support the planning decisions in Ghana. It is important for planning institutions to continue to adopt emerging approaches, such as participatory land use planning, as a means of meeting the needs of the people, which may also sway political favor towards land use planning.

4.1.3 Land use planning focus on climate change issues

The focus of land use planning on climate change issues constitutes another emerging trend (Cobbinah et al. 2019; Cobbinah & N-yanbini, 2019; Atanga & Inkoom, 2017). Land use planning promotes local adaptation to climate change through the use of tools such as planning schemes, zoning regulations, and development permits to reduce the risks to communities from flooding, urban green depletion, wetlands depletion, etc. (Ibrahim & Siiba, 2020). Therefore, the onus lies on urban planners to use these land use planning tools, such as the use of modelling in GIS innovatively to minimize the impact of climate change on urban areas. Major cities and towns in Ghana have suffered from perennial flood incidents. Therefore, in response to growing demands from the local and international levels, the government of Ghana has initiated efforts to mainstream climate change into national policy frameworks. For instance, climate change has been captured in the Ghana Shared Growth and Development Agenda (GSGDA) as a cross-cutting issue. Ghana has also successfully launched a National Climate Change Adaptation Strategy (NCCAS), National Climate Change Policy Framework (NCCPF) as well as a National Climate Change Master Plan. While these and other efforts at the national level have been widely acknowledged, it remains unclear the extent to which planners and planning authorities are mainstreaming climate change into local land-use plans. Therefore, mainstreaming climate change actions into local land-use plans will help reduce the frequent occurrence of flooding in Ghana. Considering the fact that every plan has spatial implications, land use planning functions spearheading climate change actions will ensure its effectiveness.

4.1.4 Adapting participatory land use planning approach

The widely documented emerging trends and prospects of land use planning in developing countries such as Ghana and Thailand are participatory land use planning being perceived as effective for the land use plan initiation process, preparation, and approval. Therefore, due to the complex and dynamic nature of land use planning

processes, the active engagement of key stakeholders during the preparation process is laudable to ensure high compliance with prepared land use plans. Consequently, the beneficiaries of the land use plans will always be motivated to be actively engaged in the plan preparation and implementation process. The participatory land use planning process emphasizes the importance of effective communication and information sharing among stakeholders to facilitate understanding, consensus-building, and decision-making when prepared land use plans are being implemented (Kaamah et al. 2023).

4.1.5 Adoption of technologies for land use planning functions

Unlike Ghana, the most documented emerging trend and prospect is the application of technologies for land use planning practices, resulting in a phenomenon known as smart land use planning in developed countries. Smart land use planning has progressively moved from theory to practice with the advancement and development of technology like Geographic Information Systems (GIS), Remote Sensing (RS), Global Positioning Systems (GPS), and Artificial Intelligence (AI). The application of smart land use planning is presently moving from theory to reality. Field surveys and participatory mapping are two of the labor-intensive, costly, and time-consuming traditional land use planning techniques. Currently, big data algorithms can be used for smart land use planning to boost the effectiveness and quality of planning. The information presented above leads one to the conclusion that conducting in-depth assessments of various land use planning requires the use of methodologies, including GIS, RS, resilience modeling, and landscape ecology approaches. The implication is that the adoption of digital tools for land use planning purposes in Ghana will enhance physical planning activities. Thus, the adoption of digital technologies will make land use planning effective and efficient in terms of the storage and sharing of geospatial data, and the GIS-based model is good for modelling and assessing the impact of natural disasters such as floods and landslides during land use planning. Adopting technologies for land use planning activities will make it proactive instead of reactive. The argument is that technological applications will enable physical planners across Ghana to monitor the extent of physical growth of a settlement in real time. Therefore, reducing the planning-related challenges across Metropolitan, Municipal, and District Assemblies (MMDAs), Generally, the adoption of emerging technologies by physical planners in Ghana will help make land use planning more effective and efficient.

4.2 Investigating Land Use Planning Challenges

The reviewed literature established that land use planning activities are confronted with several challenges in Ghana. These challenges include ineffective planning for climate change initiatives at the district and sub-district levels due to no structures to facilitate the mainstreaming process (Atanga & Inkoom, 2017); lack of engagement in the planning process by local citizens (Kleemann et al. 2017; Kuusaana & Eledi, 2015; Poku-Boansi et al. 2021; Korah et al. 2017); land use planning practices are dictated by individuals with little or no background in planning resulting in poorly planned Ghanaian Cities (Cobbinah & Darkwah, 2017). These challenges imply that there is a high possibility for planning to fail in providing the needed initiatives in addressing developmental and climate-related challenges.

There is a need for the government to adequately resource and improve the structures of the MMDAs in Ghana. The government needs to strengthen the capacity of the MMDAs and enhance policy and legal frameworks that will support climate change initiatives. Also, the planning professional body should ensure that the right personnel are employed by the government to undertake planning activities at the district level. Also, there should be continuous training programs for all the personnel to be abreast with emerging and contemporary planning matters so that they can adequately meet the needs of the people they serve.

4.2.1 The non-participation of citizens in the planning process

The most documented challenge is the non-participation of the local people in the planning process (see Kleemann et al. 2017; Kuusaana & Eledi, 2015; Poku-Boansi et al. 2021; Korah et al. 2017). Thus, the beneficiaries of land use plans are often not involved in the plan preparation process. Consequently, their needs and aspirations are most often ignored in the prepared land use plans for implementation (Korah et al. 2017). Similarly, Poku-Boansi et al. (2021) argued that the local populace often fails to adhere to prepared land use plans since they do not address their needs. Consequently, there is a high level of non-compliance with land use plans across Ghana. In this case, we argue that the non-participation of the local people in land use planning is due to the planning ideology that governs land use planning in Ghana. Ghana's land use planning regime is Eurocentric in nature and hence does not accommodate the inclusion of beneficiaries in the planning process. Thus, Ghana's planning regime is modeled on the Rational Comprehensive Theory, a system inherited from the British (see Boamah & Amoako, 2020; Acheampong & Ibrahim, 2016). Unlike Ghana, land use planning for urban and environmental sustainability in other countries is challenged by the poor execution of land use plans. A phenomenon, which is caused by inadequate funding, absence of political commitment, political interference, and corruption. It is reported that politicians lack the will and hence are not interested in land use planning activities, mainly because it does not yield financial returns immediately.

4.2.2 Inadequate political commitment to land use planning functions

The lack of political will and political commitment is exhibited in the form of insufficient and sometimes lack of funding for the land use plan implementation process. Also, politicians interfere in the land use planning process by influencing zoning regulations and the application of planning standards. Consequently, land use plans are often prepared to suit the preferences of politicians. Political interference is a key challenge facing land use planning in Kampala in Uganda and Kigali in Rwanda. In this case, political interference in the land use planning process will result in geographical discrepancies between urban and regional plans. This emphasizes how important it is to review current land use plans to solve the root causes of such inconsistencies, such as a lack of coordination, disputes over administrative boundaries, and disagreements over funding for the land use planning process. Until the inconsistencies described above are addressed, it may be difficult to increase environmental sustainability because of these discrepancies (such as the spatial conflicts), which have led to urban expansion on territory set aside for non-urban development, mainly intensive agriculture, and the conservation of ecologically sensitive areas.

5. Conclusion

This study provides a comprehensive review of literature on land use planning in Ghana, examining its emerging trends, prospects, and challenges. The review identified several key land use planning challenges, including ineffective planning for climate change at subdistrict levels, contradictions between planning practices and legislation, and a lack of engagement by local citizens in the planning process. Furthermore, the study noted that vague legislative frameworks and a disconnect with customary land ownership also pose significant challenges. Similar challenges such as poor execution of land use plans due to inadequate funding, lack of political commitment, corruption, and political interference were observed in other countries. Despite these challenges, the review highlighted several emerging trends and prospects for land use planning in Ghana. These include an increasing focus on climate change issues, significant benefits for residential areas through land use planning, and a growing interest in promoting spatial planning activities among major political parties. Notably, chieftaincy institutions play a crucial and evolving role in land use determination and management as custodians of a significant portion of the land. Globally, the most prominent trend is the application of technologies, leading to smart land use planning practices. Other international trends include the effectiveness of participatory land use planning and the use of spatial planning observation maps. The study concludes that Ghana's existing land use planning regime requires a significant overhaul to effectively adopt and implement these emerging trends and prospects, particularly the concept of smart land use planning prevalent in developed countries. The existing structures and architecture hinder the ability of countries to be at par with international best practices, thereby impeding sustainable growth and development. Based on these findings, the study puts forth the following recommendations for future research: (1) examine the adoption of the smart land use planning concept in Ghana; (2) explore the adoption of artificial intelligence for land use planning practices in Ghana; and (3) investigates the challenges and barriers associated with the adoption of planning support systems (computer-based tools and software) by planning professionals in Ghana. Addressing these research areas is crucial for understanding and facilitating the modernization of Ghana's land use planning regime to ensure sustainable growth and development.

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6. Appendix

Table 3. Summary of Study Methodology of Used Studies

First author	Year	Title	Objective(s)/Questions	Study design/approach	Sampling technique	Method of data analysis
Cobbinah	2020	Urban land use planning in Ghana: Navigating complex coalescence of land ownership and administration	To discuss the relationship between customary land ownership and administration in the context of land use planning, (ii) to explore institutional perspectives on sustainable land use planning, and (iii) to examine the implications of customary land ownership and administration on sustainable land use planning	Case Study	Purposive expert sampling	Thematic analysis
Awuah	2014	Benefits of urban land use planning in Ghana	To examine the economic benefit of Ghana's land use planning regime	Survey design	Simple random	Contingent valuation method
Awuah	2014	Determinants of low land use planning regulation compliance rate in Ghana	To test the hypothesis that ignorance of planning regulations and their irrelevance to the country's socio-economic conditions determine the low compliance with land use planning regulations.	Survey design	Systematic sampling	Binary logistic regression
Poku-Boansi	2021	Multi-stakeholder involvement in urban land use planning in the Ejisu Municipality, Ghana: An application of the social complexities' theory	To understand the dynamism and complexity of stakeholder involvement in the land use planning process and the implications toward sustainable city development in Ghana using Ejisu Municipality as a case study	Mixed methods	Systematic sampling	Descriptive analysis and Thematic analysis
Cobbinah	2019	Urban planning and climate change in Ghana	To explore agency perspectives and policy responses on the possibility and procedure for harnessing urban planning as a tool for managing climate change impacts in the Ghanaian city of Kumasi	Qualitative approach	Purposive expert sampling	Thematic analysis
Ibrahim	2020	Spatial planning through the political landscape of Ghana: examining the nexus between election manifestos and planning	To analyze the manifesto documents of two dominant political parties in Ghana – the New Patriotic Party and the National Democratic Congress – focusing on how spatial planning terminologies and targets are used and set	Desk review	Purposive sampling	Content analysis
Asibey	2022	Beyond rhetoric: urban planning climate change resilience conundrum in Accra	To examine urban planners' perspectives and planning responses on managing climate change impacts and building adaptive capacities in Accra, Ghana	Qualitative approach	Purposive expert sampling	Thematic analysis
Boamah	2020	Planning by (mis)rule of laws: The idiom and dilemma of planning within Ghana's dual legal land systems	How do Ghana's dual legal land systems support or constrain the idiom of planning Ghanaian cities and regions?	Qualitative approach	Purposive expert sampling	Thematic analysis
Cobbinah	2017	Urban planning and politics in Ghana	The future of urban planning in Ghana is analyzed through the influence of traditional and modern political systems	Qualitative approach	Purposive expert sampling	Thematic analysis
Korah	2017	Spatial Planning in Ghana: Exploring the Contradictions	to explore the complexity of spatial plan preparation and implementation and, to examine the contradictions of spatial plans and 'actual development' occurring in Kumasi	Case study	Purposive expert sampling	Thematic analysis
Acheampong	2016	One Nation, Two Planning Systems? Spatial Planning and Multi-Level Policy Integration in Ghana: Mechanisms, Challenges and the Way Forward	To examine the key features of Ghana's spatial planning system focusing on the mechanisms and challenges of policy integration in practice.	Qualitative approach	Purposive expert sampling	Thematic analysis
Poku-Boansi	2017	Are we planning for resilient cities in Ghana? An analysis of policy and planners' perspectives	To determine how well planning practice advances resilience planning	An exploratory approach	purposive sampling	Thematic analysis
Cobbinah	2019	Climate Change Adaptation in Urban Ghana: The Spatial Planning Dimension	assesses the role of spatial planning in responding to climate change and appraises instances of development plans addressing climate change issues.	Exploratory research design	Purposive sampling	Thematic analysis
Hersperger	2021	Digitalization in land-use planning: effects of digital plan data on efficiency, transparency and innovation	Developing an analytical framework based on efficiency, transparency, and innovation, to explore how digital plan data affect land-use planning.	Qualitative Approach	Purposive sampling	Thematic analysis
Huggins	2018	Land-Use Planning, Digital Technologies, and Environmental Conservation in Tanzania	Examining how participatory land-use planning" Tanzania and to demonstrate that the use of digital technologies in the planning process are significant not necessarily in terms of assuring greater local "participation" but in terms of the use of digital information to link different elements of the environmental conservation assemblage. has been used within environmental conservation projects in	Qualitative approach	Purposive sampling technique	Thematic analysis
Zolkafli	2017	An evaluation of participatory GIS (PGIS) for land use planning in Malaysia	To evaluate the capacity of the general public to effectively contribute to land use planning outcomes in Malaysia using Participatory GIS (PGIS).	Qualitative approach	Purposive sampling technique	Spatial analysis and thematic analysis
Roccati	2021	GIS-Based Landslide Susceptibility Mapping for Land Use Planning and Risk Assessment.	To map landslide susceptibility in the Portofino promontory, a Mediterranean area that is periodically hit by intense rain events that induce often shallow landslides.	Quantitative approach	Purposive sampling technique	Semi-quantitative analytical hierarchy process (AHP) method
Russo	2018	Adoption and Use of Software in Land Use Planning Practice: A Multiple Country Study	investigating in-depth the current situation regarding attention to the quality of such systems from the point of view of their users the adoption of PSS and identifying factors preventing their wider use, devoting particular	Qualitative approach	Purposive sampling technique	Thematic analysis
Chunlu	2017	GIS-based dynamic modeling and analysis of flash floods considering land-use planning	To measure and visualize the land-use impact on flash floods through a dynamic analysis	Quantitative approach	Purposive sampling technique	Spatial analysis
Jahantigh	2019	A quantitative approach to land use planning using GIS a case study of Chabahar county, Iran	To prepare a land use plan for Chabahar County, Iran, based on a quantitative model using GIS.	Quantitative model using GIS	Purposive sampling technique	Spatial analysis

Table 4. Summary of Study Methodology of Used Studies - Continues

First author	Year	Title	Objective(s)/Questions	Study design/approach	Sampling technique	Method of data analysis
Oliveira	2019	Spatial planning instruments for cropland protection in Western European countries	To: (i) give an overview of the urgency of cropland protection; (ii) describe the inclusion of instruments for cropland protection in planning practice, and (iii) to discuss the implementation performance of the instruments of cropland protection that were found.	Qualitative methods	Purposive sampling technique	Thematic analysis
Zhang	2018	Can land use planning help mitigate transport-related carbon emissions? A case of Changzhou	(1) What are the spatial distributions of transport-related carbon emissions and land use patterns? (2) Are spatial distributions of transport-related carbon emissions	Traffic assignment model	Purposive sampling technique	Inferential and descriptive statistics
			Correlated to land use and landscape pattern? (3) What land use policies and spatial planning strategies are effective in transport-related carbon reduction?			
Mustafa	2018	Effects of spatial planning on future flood risks in urban environments	Evaluation of the impacts on flood damages from spatial planning policies that consider expansion versus densification processes compared with spatial planning policies oriented towards development restrictions in flood-prone zones.	Quantitative model using GIS	Purposive sampling technique	Spatial analysis
Xu	2019	Identifying the trade-offs between climate change mitigation and adaptation in urban land use planning: An empirical study in a coastal city	Investigating the role of urban land use in both climate change mitigation and adaptation.	Quantitative approach	Simple random sampling	Descriptive statistics and spatial analysis
Peskett	2023	Regional scale integrated land use planning to meet multiple objectives: Good in theory but challenging in practice	Investigating whether the introduction of additional regional institutions can help address these challenges	Qualitative approach	Purposive sampling	Thematic analysis
Revington	2022	Land-Use Planning Approaches to Near Campus Neighborhoods and Student Housing Development Patterns in Ontario, Canada	Investigating the approaches municipalities across an urban system have adopted to address student housing issues through land-use planning and their subsequent influence on development patterns	Qualitative approach	Purposive sampling technique	Content analysis
Enoguanbhor	2021	Key Challenges for Land Use Planning and Its Environmental Assessments in the Abuja City-Region, Nigeria	Investigated and identified key challenges of land use planning and its environmental assessments to improve the urban and environmental sustainability of city regions.	Mixed methods approach	Simple random and purposive sampling techniques	Thematic analysis and spatial analysis
Bai	2018	Developing China's Ecological Redline Policy using ecosystem services assessments for land use planning	To determine ecological, redline areas (ERAs) in Shanghai using: ES, biodiversity and ecologically fragile hotspots, landscape structure, and stakeholder opinions.	Quantitative model	Purposive sampling using GIS	Spatial analysis and thematic analysis
Kaamah	2023	Policy and practice: Stakeholders' use planning in Ghana satisfaction with conventional and participatory land	The aim was to explore the similarities and differences between the two approaches and stakeholders' perceptions and satisfaction with both processes.	Mixed methods	Purposive and simple random approach	Thematic analysis and inferential statistics
Soria-Lara	2015	European spatial planning Merely spatial databases or also effective tools for planning? observatories and maps:	Assessing the performance for planning that a relevant number of European SPOs have according to their maps	Qualitative approach	Purposive sampling technique	Content analysis
Mockrin	2020	After the fire: Perceptions of land use planning to reduce wildfire risk in eight communities across the United States	Investigating how local leaders and planners perceived land use planning and residential regulations, identifying broad themes about the challenges and benefits of using regulations and planning to reduce wildfire risk.	Qualitative approach	Purposive sampling	Thematic analysis
Sangawongse	2021	From Centralized Planning to Collaborative Urban Land Use Planning: The Case of Wat Ket, Chiang Mai, Thailand	To discuss efforts, by local stakeholders, to apply collaborative urban planning as an alternative approach to urban planning in Wat Ket	Collaborative action research	Purposive sampling	Thematic analysis
Sharifi	2014	Can master planning control and regulate urban growth in Vientiane, Laos?	Examining the effectiveness of utilizing the master plan as a management tool to regulate urban growth in Vientiane, the capital city of Laos.	Mixed-methods approach	Purposive sampling	Spatial analysis
BenDor	2017	A research agenda for ecosystem services in American environmental and land use planning	Assessing pathways for integrating the ecosystem services concept into American land use and environmental planning.	Qualitative approach	Purposive sampling	Thematic analysis
Siiba	2020	Chieftaincy and sustainable urban Land use planning in Yendi, Ghana: Towards congruence	To Explore the relationship between chieftaincy and urban land use Planning through the process of land development, and to Examine the contributions made, or limitations imposed by chieftaincy on sustainable urban land use planning.	Qualitative approach	Purposive sampling	Thematic analysis
Kleemann	2017	Peri-urban land use pattern and its relation to land use planning in Ghana, West Africa	What are the patterns of peri-urban development and differences between northern and southern Ghana, using Bolgatanga as an example for the north and Takoradi as an example for the south? What are the determinants of urban development for both study areas? Which conclusions can be drawn for land use planning? What are the current opportunities and challenges of land use planning and how can they be linked to urban sprawl? What are the (dis-)advantages of a mixed method approach to analyze peri-urban land use patterns?	Mixed methods	Convenience sampling	Thematic analysis and spatial analysis