

Urban Sprawl in Sub-Saharan Africa: A Case Study of the Greater Kumasi Metropolitan Area, Ghana

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Abstract

A key characteristic of urban form in the global North, especially in Northern America and Australia, is urban sprawl. Global South cities have been expanding rapidly since the 1990s and feature urban sprawl. Some defining characteristics of urban sprawl are low density development, widely separate land uses, and high dependency on automobiles with limited multi-modal accessibility. In this paper, we present the causes and effects of urban sprawl in Ghana, policies adopted by Ghanaian cities to manage urban sprawl, and how these strategies could be improved. We find that local governments in Ghanaian cities, especially Greater Accra Metropolitan Area and Greater Kumasi Metropolitan Area, have not implemented any real, effective strategies to curb urban sprawl; instead, they have focused their efforts on providing essential infrastructure services. The only measure that many Ghanaian local governments have implemented is the reduction of the minimum permissible lot size for houses. Based on a systematic review of existing studies to identify the causes and effects of urban sprawl, and of best practices used by cities to combat it, we suggest a few practical measures employed in other countries be used in the Ghanaian context.

Keywords: urban sprawl, urbanization, growth management, local government, and land use

1. Introduction

Over half of the world's population lives in urban areas (UN-Habitat, 2016; UN, 2019). This proportion is predicted to increase to 68% by 2050. Africa is the world's fastest-urbanizing continent with an annual urban population growth rate of 4.1% (Guneralp et al. 2018; Combes et al. 2023). Africa's urban population is expected to increase from 0.4 billion in 2010 to 1.26 billion by 2050 (UN-Habitat, 2016; UN, 2019). A key feature of this growth in Africa is urban sprawl.

Urban sprawl, experienced by cities both in the global North and South, has many definitions. According to Rosni and Mohd Noor (2016), urban sprawl is an inefficient and dysfunctional urban development pattern that reduces the effective use of land and jeopardizes the built environment's sustainability. Esfandiyar and Hossein (2019) define sprawl as unplanned growth that changes a city's physical layout. Rameshbhai & Gandhi (2019) and Sinha (2018) describe urban sprawl as unplanned or poorly planned urban expansion. A consensus definition of urban sprawl is low-density, ribbon or strip development, unrestricted outward growth, leapfrog development (Owusu, 2013; Hamidi et al., 2018; Takyi et al, 2023; Tagnan et al. 2022), segregated land uses, and automobile-centric transportation systems.

There is much concern about urban sprawl in Africa (Arku, 2009) where large cities have been growing at very high rates, much higher than national population or economic growth rates. Stren (2019) notes that many African cities are in crisis because of urban sprawl. Santos et al., 2017 note that many sub-Saharan African cities had very high annual growth rates between 2000 and 2016 (such as Abuja in Nigeria – 7.1%, Luanda in Angola – 5.0% and Lusaka in Zambia – 4.7%), and that most new urban residents live in areas with limited access to basic infrastructure like water and sanitation. Urban sprawl in Ghana also has received a fair amount of research attention, primarily regarding the effects of sprawl (Yiran et al., 2020); of the many negative effects of sprawl, environmental degradation has received the most attention. Cobbinah & Aboagye (2017), Tera et al. (2019), and Abass et al. (2020) note improved transportation systems, increasing household income, and lack of coherent and well-structured spatial planning strategies as the major contributing factors to urban sprawl in Sub-Saharan Africa (SSA). Weak local government institution in Sub-Saharan Africa aggravate it (Amponsah et al. 2022). Some of the causal factors

are like those in global North countries, especially the United States – these include depopulation of inner cities, increasing demand for single-family housing, and the expansion of roads and highways (Catalan et al. 2008; Tagnan et al. 2022). Cities and states in the global North have tried to combat urban sprawl with a variety of policies and tools such as greenbelts, urban growth boundaries, urban service area limits, and high development permit fees (Adler 2017 pp 52-63; Ismail et al. 2018; Kardani-Yazd et al. 2019). The successes of these measures are uneven, varying by location, and sometimes are not very tangible (Amponsah et al. 2022). Using such tools to mitigate urban sprawl is less common in SSA (Amponsah et al. 2022). Perhaps the differences in the dynamics of urban sprawl between the global North and South pose significant constraints to the use and effectiveness of global North anti-sprawl strategies in the global South.

There is a significant amount of urban sprawl in Ghana, particularly in the Greater Accra Metropolitan Area (GAMA) and Greater Kumasi Metropolitan Area (GKMA). Large-scale road infrastructure development (Amedzro et al. 2024), and rapid population growth (Cobbinah, 2014) are deemed to be the causes. Urban sprawl consumes a large amount of peri-urban land (Varkey 2019; Panchal & Padhya 2021; Rajasekaran & Radhakrishnan 2022) and has increased congestion. Since most sprawled developments do not have adequate infrastructure and services (Yiran et al. 2020), it exacerbates problems caused by pre-existing basic infrastructure deficits in peri-urban areas (Cobbinah & Aboagye 2017; Tikoudis et al. 2018).

Rapid, haphazard urbanization has characterized Ghana's recent urban growth. Providing an urban environment that is physically integrated, environmentally sustainable, socially inclusive, and economically successful has become a key challenge for city authorities (Adarkwa 2012; Owusu, 2013; Cobbinah & Aboagye 2017). Many studies highlight the need for effective urban planning and the provision of services to address the challenges posed by urban sprawl in Ghana. In this paper, we seek to examine the causes and effects of urban sprawl in Ghana and policies and strategies adopted by city authorities in controlling and managing urban sprawl in Ghanaian cities.

2. Location

We focused our study on the Greater Kumasi Metropolitan Area (GKMA) in Ghana. Ghana is one of the largest economies in Africa, has a wealth of resources and has enjoyed long periods of political stability. GKMA, in the center of the country (see Figure 1), is the regional capital of the Ashanti region of Ghana and covers an area of about 2,850 km² of urban, peri-urban, and rural lands. It shares boundaries with Offinso Municipality to its north, Asante Akim Central Municipality on the east, Bosome Freho District in the south, and Atwima Mponua District to its west. GKMA has 16 administrative areas -- one metropolitan area, ten municipalities, and five district assemblies. Its population is about 3,348,000 and a growth rate of 4.43% between 2018 and 2020. Kumasi, the central city of the GKMA, is the second largest city in the country, its fastest growing city, and plays important educational, economic, commercial, transportation, and administrative functions for the whole country (Cobbinah & Amoako, 2012). Kumasi has the largest open market in West Africa and serves as a commercial hub for Ghana and neighboring countries such as Togo, Burkina Faso, Cote d'Ivoire, Mali, and Nigeria (Amoako, 2014). Kumasi is also renowned for its rich cultural heritage. Despite its pre-eminent role in Ghana's economy, culture, and politics, most studies of urban sprawl in Ghana have focused on Accra, Ghana's capital city, ignoring Kumasi; we hope to partly offset this shortcoming.

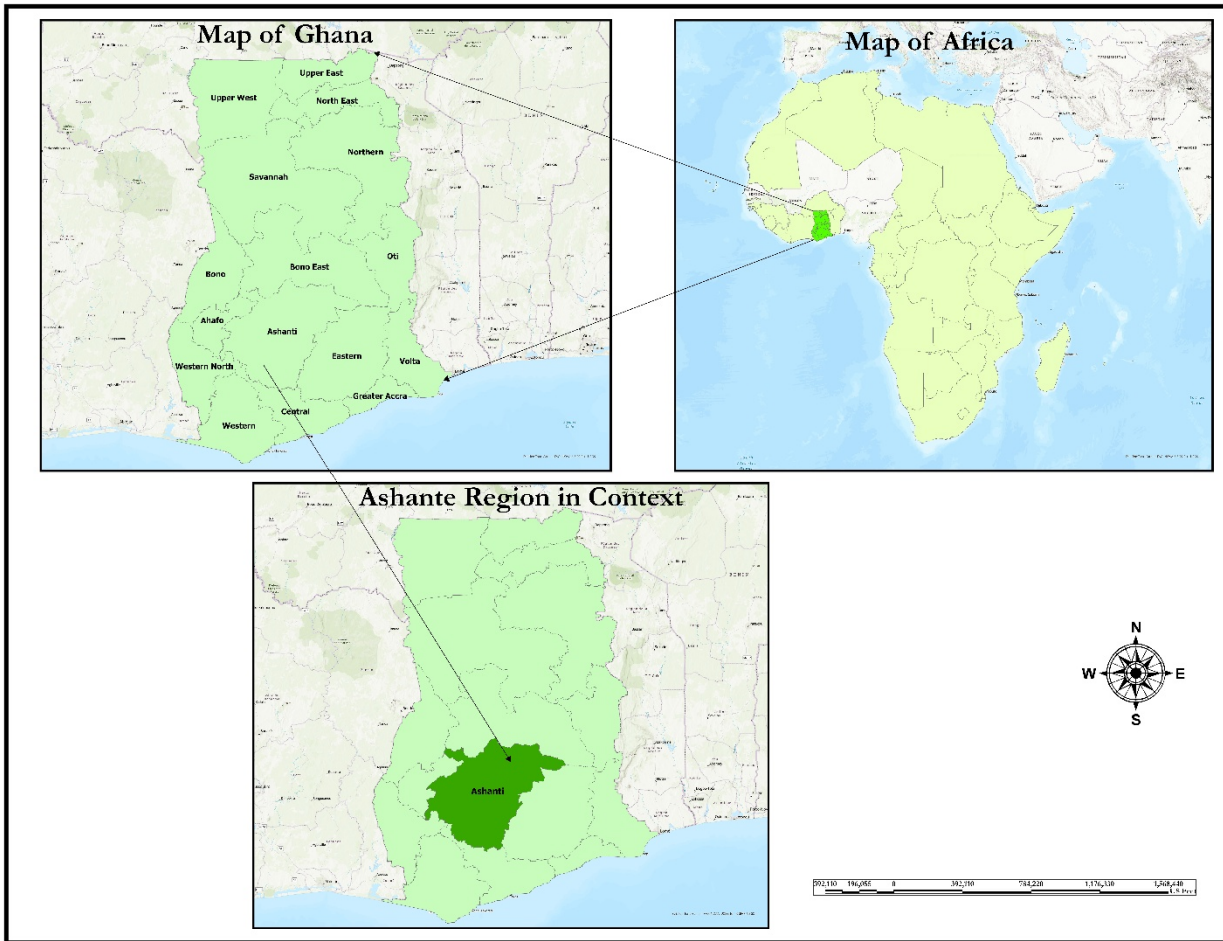


Figure 1. Map of Africa and Ghana showing major regions

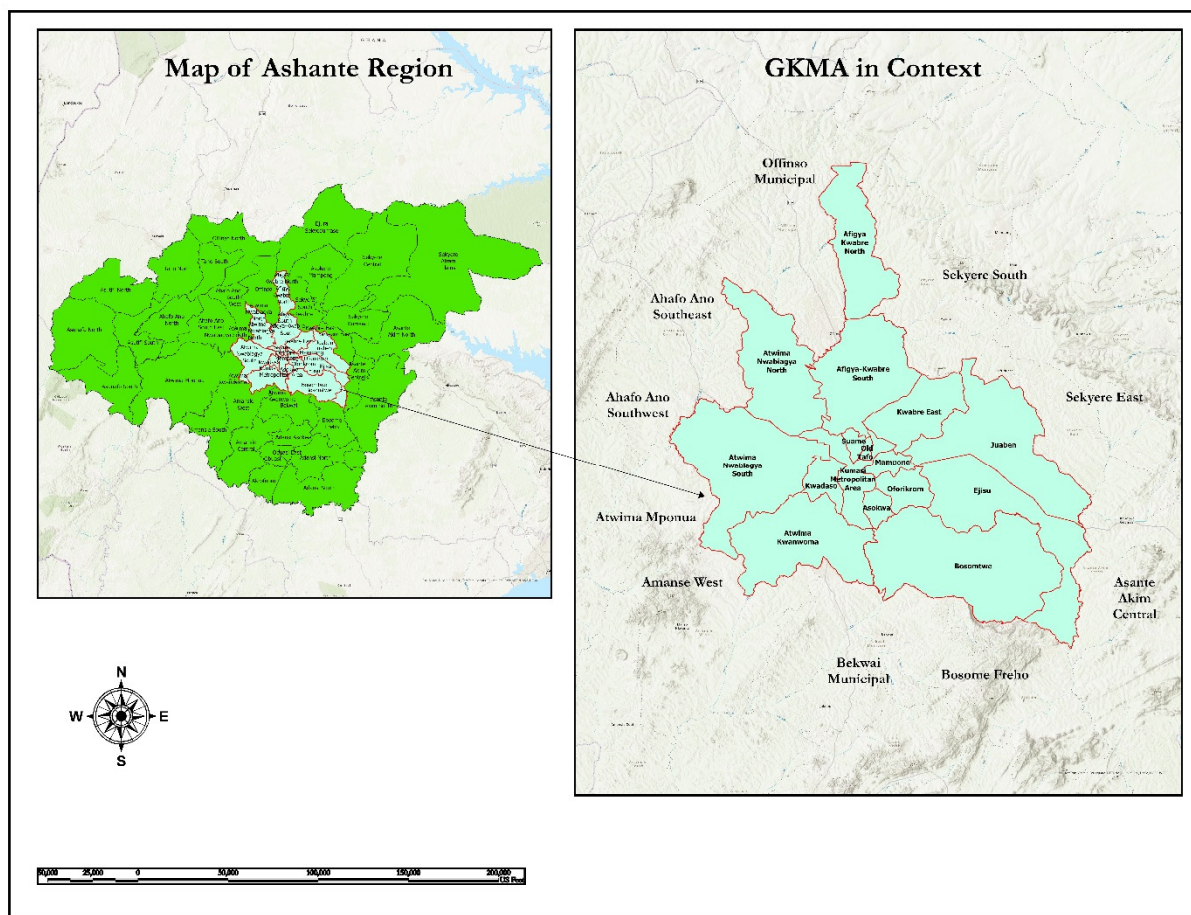


Figure 2. Location map of GKMA

Greater Kumasi Metropolitan Area (GKMA) experienced rapid population growth, from 1984 to 2010. Its 1984 population of 490,000 surged to 1,170,000 by 2000, an increase of 680,000. Then from 2000 to 2010, it grew by another 860,000, reaching a total of 2 million. This growth was accompanied by significant spatial expansion of urbanized areas. As Table 1 below shows, from 1984-2000 there was significant population growth in both Kumasi Metropolis (5.6% per annum) and its surrounding districts (4.24% per annum). However, from 2000 to 2010, while the population of Kumasi Metropolis continued to grow rapidly (as high as 5.69% per annum), the surrounding districts experienced a slowdown, with an annual average growth rate of just 2.16% per annum. One reason for the difference in growth rates is the relative lack of basic infrastructure in the suburban areas.

Table 1. Population of GKMA sub-region and Ashanti region, 1984, 2000, and 2010

| Districts in GKMA | Population | | | Annual Population Growth Rate (%) | | Area (KM ²) | Population Density (persons/km ²) | |
|--|--------------------------|--------------------------|--------------------------|--------------------------------------|-----------|----------------------------|--|-------|
| | 1984 | 2000 | 2010 | 1984-2000 | 2000-2010 | | 2000 | 2010 |
| Kumasi Metropolis | 487,504 ^{*1} | 1,170,270 ^{*5} | 2,035,064 ^{*5} | 5.63% | 5.69% | 254 | 4,607 | 8,012 |
| Afigya-Kwabre | 39,971 ^{*2} | 89,358 ^{*4} | 136,140 ^{*5} | 5.16% | 4.30% | 517 ^{*6} | 173 | 263 |
| Kwabre East | 42,044 ^{*2} | 101,100 ^{*4} | 115,556 ^{*5} | 5.64% | 1.35% | 135 ^{*6} | 750 | 857 |
| Ejisu-Juaben | 78,783 ^{*1} | 124,176 ^{*3} | 143,762 ^{*5} | 2.88% | 1.48% | 732 ^{*6} | 172 | 199 |
| Bosomtwe | 41,283 ^{*2} | 66,788 ^{*4} | 93,910 ^{*5} | 3.05% | 3.47% | 353 ^{*6} | 189 | 266 |
| Atwima Kwanwoma | 44,437 ^{*2} | 79,240 ^{*4} | 90,634 ^{*5} | 3.68% | 1.35% | 291 ^{*6} | 273 | 312 |
| Atwima Nkwabiagya | 56,352 ^{*2} | 127,809 ^{*4} | 149,025 ^{*5} | 5.25% | 1.55% | 597 ^{*6} | 214 | 250 |
| Outside KMA | 302,870 ^{*7} | 588,471 ^{*7} | 729,091 ^{*7} | 4.24% | 2.16% | 2,616 | 225 | 279 |
| Greater Kumasi Sub-Region | 790,374 ^{*7} | 1,758,741 ^{*7} | 2,746,091 ^{*7} | 5.13% | 4.62% | 2,870 | 613 | 963 |
| Outside Greater Kumasi Sub- Region | 1,299,726 ^{*7} | 1,854,209 ^{*7} | 2,016,289 ^{*7} | 2.25% | 0.84% | 21,519 | 86 | 94 |
| Ashanti Region Ghana | 2,090,100 ^{*1} | 3,612,950 ^{*3} | 4,780,380 ^{*5} | 3.48% | 2.84% | 24,389 | 148 | 196 |
| | 12,296,081 ^{*1} | 18,912,079 ^{*3} | 24,658,832 ^{*5} | 2.73% | 2.69% | 238,533 | 79 | 103 |

Source: *1: 1984 Population and Housing Census

*2: Estimate based on 2010 District Boundaries and 1984 Community Populations

*3: 2000 Population and Housing Census

*4: Estimate based on 2010 District Boundaries and 2000 Community Populations

*5: 2010 Population and Housing Census

*6: Area measured using the District Boundary Maps by Town and Country Planning Department, Regional Office.

*7: Japan International Cooperation Agency (JICA) (2013)

GKMA's population growth has expanded the urban land within it, extending up to 30 km from the center of the GKMA. In 2000, Kumasi's built-up (that is, urbanized) area was about 219 km², or about 8% of the total land area of GKMA, while its non-built-up area was 2,388 km², or about 92% of the GKMA area. By 2010, the built area had increased to 25%, decreasing the open space in GKMA to 1,953 km² in 2010 (Tagnan et al. 2022). This has changed the physical structure of the GKMA, with significant decreases in farmlands, green areas, natural vegetation, and horticultural lands (Oduro et al., 2014). Urban sprawl in the GKMA is rapidly consuming fringe rural communities while weakening effective management of the metropolis causing problems such as congestion, and a lack of critical public infrastructure and social services in the newly urbanizing areas (Cobbinah & Amoaka, 2012). Could local governments within GKMA do anything to contain this sprawl?

3. Causes of Urban Sprawl in Ghanaian Cities

Before designing strategies to combat sprawl in Ghana, one must understand its causes. While many of the drivers of urban sprawl are similar globally, there are often variations by country and region, and location-specific causal factors as well. Cities in the global North have good road infrastructure that supports sprawl. In the global South other factors seem to be more important: lax planning systems, inadequate land administration, and informal developments resulting from an inefficient formal housing market that is unable to meet ballooning demand in quantity or quality.

According to Cobbinah & Amaoko (2012), urban sprawl takes various forms in Ghana. One form is this: physical development in peri-urban areas in a nucleated pattern, often characterized by a concentration of individuals from a specific social class, income group, culture, or tribe. A second form entails leapfrog development, where physical growth jumps over vast tracts of greenfield; this form is sporadic, catalyzed, by commercial or industrial activities, and results in inefficient use of land and the destruction of ecologically sensitive areas within and near existing urban areas (Owusu-Ansah & O'Connor, 2010; Cobbinah & Korsah, 2015). A third form in Ghana is: fragmented or scattered urban development that is uneven, and dispersed, without any of the commercial or industrial catalysts (Cobbinah & Aboagye, 2016). One feature of Ghanaian urban sprawl that sets it apart from urban sprawl in global North cities is this: most of the sprawl manifest in Ghana is not low-density sprawl whereas in global North cities, urban sprawl is characterized by extremely low densities. This feature of Ghanaian sprawl is also found in many global South cities. So here below, we discuss, the drivers of urban sprawl in Ghanaian cities, particularly GKMA.

3.1 Rapid Population Growth

Rapid population growth, caused primarily by rural-to-urban migration, has been a major driver of urban sprawl in the global south (Owusu, 2013). Urban areas in the global south have several pull factors, such as better economic prospects and higher quality facilities, amenities, and services, that draw rural residents to them (Azunre et al., 2021). High poverty levels in rural areas are a critical push factor, driving rural residents to cities.

Migration has played a pivotal role in Ghana's urban population growth over the last 8-9 decade (GSS, 2014). In 1931, only 9.4% of Ghana's population resided in urban areas. This proportion steadily increased to 13.9% in 1948, 23% in 1960, 28.9% in 1970, 31.3% in 1984, and 43.9% in 2000 (GSS, 2014). By 2010, the urban population surpassed 50.9%, marking the first time Ghana had an urban population exceeding 50% (GSS, 2014). In 2021, approximately 57% of Ghana's population lived in urban areas (GSS, 2021). In addition to rural-to-urban migration from within the county, Ghana attracts migrants from other African countries, especially from countries to its north, owing to its relative prosperity (GSS, 2010). Existing literature on Ghanaian cities confirms *rapid* population growth (not just population growth) as the major factor in the emergence of urban sprawl (Tagnan et al. 2022). Cobbinah & Amoako (2012) point to this reason as the prime cause for urban sprawl in the GKMA.

3.2 Preference for Low-Density Housing

Ghanaian families have become increasing nuclear especially in urban areas. Nuclear families increase the number of homes needed (Kumar, 2018; Acheampong, 2015; Tagnan et al. 2022). Moreover, most nuclear families view new homes in the suburbs or low-density neighborhoods as desirable long-term investment (Cobbinah & Amoako, 2012). Cobbinah & Aboagye (2017) report that nuclear families in the GKMA favor single-family homes both within urban and peri-urban areas, increasing the demand for land in the GKMA. The nuclearization of families in Ghanaian cities and the housing preferences of nuclear families, are a major driver of urban spatial expansion (Agyemang et al. 2018; Danso-Wiredu 2020; Tagnan et al. 2022). This factor has not received much attention in current literature on this topic.

Another contributing factor to low-density urban growth is the social status and advantages associated with homeownership. In numerous cities in Ghana, young adults (25-40 years old) are striving to acquire residential property. This has led many traditional landowners to subdivide agricultural land without adhering to proper planning guidelines or considering the necessary infrastructure to ensure a conducive living environment. This leads to the loss of agricultural and forest land to suburban development (Fertner et al. 2016).

3.3 Rising Income

Better employment opportunities and higher incomes in urban areas influence people's choice of the location of housing (Tagnan et al., 2022). Urban economic growth significantly alters the structure of cities and towns (Al Jarah et al., 2019; Bagheri & Tousi, 2018). Spatial evidence of this can be seen in Ghanaian cities. Tagnan et al. (2022) note that middle-class and upper-class Ghanaian households desire large homes, manicured lawns, swimming pools, and green spaces, and like to live in exclusive residential communities. This generates demand for new housing and neighborhoods, faster than city leaders may plan for (Yiran et al. 2022). Tagnan et al. (2022) also found that higher income residents favor living in spacious peri-urban environments, free of noise pollution and air pollution, and with lesser traffic. Urban sprawl happens when such peri-urban development is haphazard and widespread.

3.4 Improved Transportation System and Network

Researchers have highlighted the transportation system as a key determinant of urban sprawl (Rameshbhai & Gandhi, 2008; Sinha, 2018). Sinha (2018) notes that urban sprawl in the U.S. was facilitated by the building of highways, primary, and secondary roadways that link cities, towns, and rural areas to urban centers. The

development of highways during the middle- and late-20th century had and continues to have a significant influence on urban areas. Cities like Cleveland, and Atlanta are often cited as illustrations of the effect of auto-centric transportation systems on urban sprawl (Center for Neighborhood Technology 2011). Construction of highways has a similar (though not as profound) catalytic effect on urban sprawl in developing countries as well (Malarvizhi et al. 2021; Tagnan et al. 2022). Road improvements in peripheral areas allow city dwellers to commute from there to the city center locations for work, education, retail, personal business, recreation, and healthcare. Vermeiren et al. (2022) claim that an improved transportation infrastructure within cities and towns is a key factor in promoting urban sprawl. In Ghana, road construction in peri-urban and rural locations often encourages the growth of commercial and industrial areas and the establishment of new towns, generating urban sprawl (Akinradewo et al. 2020). Cobbinah & Amaoko (2012) and Amoateng et al. (2013) blame the development of new roads and highways for sprawl in Accra, Kumasi, and other towns in Ghana.

3.5 Lack of a Robust and Responsive Planning Framework

The absence of comprehensive, proven physical planning frameworks to combat urban sprawl in the global South allows sprawl to thrive there. In general, authorities tend to only loosely regulate new development outside of the major metropolis' (Takyi et al, 2023). That said, sprawl happens in the global north despite the presence of well-established principles, and policies. and institutions for urban planning (Olujimi, 2009; Cobbinah & Amoako, 2012; Owusu, 2013).

Urban planning agencies in many sub-Saharan nations, such as Ghana, are inefficient and ineffective, fostering urban sprawl (Cobbinah & Aboagye, 2017). Public planning agencies in GKMA operate with numerous constraints. Urban planning organizations and local government planning offices have limited resources and staff capacity. Given this governance lacunae, developers in the regions undermine planning efforts, building haphazardly even in areas that they are legally restricted from developing.

Tribal organizations are the guardians of land not owned by government agencies and private entities and individuals. Such land surrounds urban areas. Often, statutory planning institutions do not collaborate with tribal leaders, leading to ineffective development planning and implementation.

Planning agencies in Ghana also suffer from political interference in their decision-making and operations, lack of trained staff, low funding, and crucially, corruption, especially in enforcement of building/planning regulations in Ghanaian cities (Yiran et al., 2020). This has been a challenge to the planning practice of local governments and has limited the power of planners and public agencies to effectively and efficiently implement planning tools to ensure sustainable urban development in Ghana. Furthermore, there is a serious lack of coordination among government entities involved in overseeing land development and city governments often operate without coordinating with planning agencies.

Urban planning and development in Kumasi, as in Ghana and other developing countries, has generally not engaged with stakeholders in urban development. Engaging with a wide range of stakeholders has been proven to have significant positive effects in educating them about the benefits of contemplated actions, creating ownership of formulated plans, and increasing support in plan implementation.

4. Effects of Urban Sprawl

4.1 The Negative Effects of Urban Sprawl

Urbanization increases municipal spending since local governments are expected to provide public services that ensure a comfortable standard of living for urban residents (Yan et al. 2021). According to Yan et al. (2021), urban sprawl significantly exacerbates the financial strain on local governments. Infrastructure, such as roads, electric power lines, and water and drainage pipelines, to serve populations living in sprawled locations costs much more than in non-sprawled locations (Bo et al. 2017; Burchell & Listokin, 2017). Ghanaian cities, like many cities in developing nations, are cash-strapped, unable to serve even compact urban areas with reliable and good quality services, let alone residents living in sprawled locations. In response to this situation, sometimes residents try to fend for themselves, creating new problems. For example, in recent years, residents in peri-urban areas have drilled private wells (Fordjour et al. 2024) for water from groundwater sources, depleting those resources. Also, in the absence of municipal sewage systems, residents use septic tanks often of inferior quality whose leachates contaminate groundwater sources (Takal & Quaye-Ballard, 2018; Fordjour et al. 2024). Retrofitting municipal sewage and water supply systems in areas that have such self-developed methods is challenging.

Urban sprawl reduces urban green space. Between 2005 and 2010, Ghana's annual rate of deforestation was 2.19% (Proforest, 2018; Nketia et al., 2021), the sixth fastest deforestation rate in the world (Nketia et al. 2021). Kumasi was once called the Garden City of Ghana. It had lush flora, a variety of fauna, and a development pattern based

on Ebenezer Howard's Garden City concept. Urban sprawl has changed all that. Peri-urban areas, which once provided the city with agricultural supplies, now grow houses (Obosu-Mensah, 2022; Osumanu & Ayamdoo 2022; Quarm & Begho 2024). Green spaces in and around Kumasi have been depleted (Oduro-Ofori et al. 2014; Mensah et al. 2017). Even areas designated as environmentally fragile spaces within GKMA by local governments in the GKMA have been built upon (Oduro-Ofori et al. 2014; Nketia et al. 2021). In the past, these spaces facilitated rainwater percolation into the ground; now rainwater falling on large tracts of impervious ground causes urban flash-flooding (Abass et al, 2020).

The growing spatial extent of the GKMA also encourages automobile dependency, which in turn increases emissions and affects area residents' health. Car ownership among residents in GKMA has increased in recent years (Adarkwa & Poku-Boasi, 2011; GSS 2013; Gyamfi & Opoku, 2024). The proportion of trips made by automobiles has also increased (GSS, 2013; Picarelli et al. 2017; Brookins, 2019; Boamah et al. 2020). As a result, more greenhouse gases are released into the atmosphere (UN 2019; WHO & Pierpaolo, 2021). Many automobiles in use in Ghana are pre-owned, imported from other countries, and have high emissions (Armah et al. 2010; Amegah et al. 2021). Recently, Ghana's central government banned the importation of automobiles that are over ten years old; however, the effectiveness of this ban is compromised by bribery and corruption in the enforcement agencies. So, emissions in and around Ghanaian cities continue to rise (Ottelin et al. 2018).

4.2 Positive Effects of Urban Sprawl

Urban sprawl does have some positive effects. It generates tax revenue from land and real estate for local governments (Lin et al. 2015; de Duren & Compean, 2016; Varela-Candamio et al. 2019); value-added taxes and corporate income taxes can also accrue from urban sprawl (Burchell & Listokin, 2017). Sprawl provides residents access to cheaper land and houses in peri-urban areas (Glaeser & Kahn, 2004; Cobbinah & Aboagye, 2017), creating housing opportunities for both low-income households seeking lower-priced homes, and high-income households seeking larger homes (Wei & Ewing, 2018; Rajasekaran & Radhakrishnan 2022; Narayani & Nagalakshmi 2023; Asibey et al. 2024).

5. Government Efforts to Mitigate Urban Sprawl in the GKMA

Responding to the increasing population in GKMA, the central government of Ghana used national Legislative Instruments (L.I.) to carve out new jurisdictions within the GKMA. The first such municipality to be created was Asokore Mampong Municipality in 2012. Then in 2018, the government created five new municipalities using the Local Governance Act, 2016 (Act 936) -- Oforikrom, Suame, Old Tafo, Kwadaso, and Asokwa. These six municipalities are categorized as 100% urbanized.

Other than creating new municipalities to better manage urbanization and provide municipal services, local governments in the GKMA have implemented only one strategy to curb urban sprawl – reduced the minimum permissible lot size for houses, thereby allowing for higher density development and more compact urban areas. In the past, residential land in Ghanaian cities was typically 120 feet by 120 feet. It is now only 100 feet by 100 feet at its largest and 60 feet by 70 feet at its smallest. In large cities, some lots are almost 70 feet by 80 feet in size. By and large, local governments in the GKMA have focused on expanding urban infrastructure in sprawling developments. Cobbinah & Aboagye (2016) note that the local government's provision of basic infrastructure is insufficient to manage and regulate urban sprawl in GKMA.

6. Suggested Measures for Mitigating Urban Sprawl in Ghanaian Cities

Ghana's urban sprawl, as noted by Cobbinah & Aboagye (2016), occurs in the absence of essential infrastructural services such as water, sanitation, and transportation. Unfortunately, local governments, decision-makers, and urban planning organizations in Ghana lack access to well-informed guidance on how to effectively address this growing challenge. Cobbinah & Aboagye emphasize the difficulty faced by urban planning organizations, local policymakers in Ghana, and the GKMA in managing and mitigating urban sprawl without a clear understanding of its implications for urban functionality, residents, and urban areas. They state that government policies should aim at resolving the shortcomings, and conflicts between various sociocultural elements, political factors (such as the activities of traditional authorities), institutional conditions like under-resourced urban planning agencies, and reigniting public interest in urban planning issues (by say, engaging more with all stakeholders). Urban planning organizations, local governments, and policymakers can help create sustainable communities only when they recognize the numerous issues associated with sprawl and try to manage urban growth through a well-structured approach incorporating deliberative processes involving all stakeholders.

Tagnan et al. (2022) suggest that local governments and planning authorities should encourage housing developments that promote densification while also ensuring occupants' privacy and comfort. Additionally, city

authorities should use anti-sprawl measures such as higher property taxes, and impact fees on new properties away from city centers. Adequate planning and regulatory institutions, zoning, a land titling system, and effective coordination between cities and their peripheries in planning to restrict urban sprawl are all necessary to enable the successful and efficient execution of these policies.

In the global North, a wide variety of tools and techniques have been employed to combat urban sprawl. These include greenbelts, urban growth boundaries, urban service limits, impact fees (that are charged on new developments to help pay for the costs of extending infrastructure to them) and controlling development through effective enforcement of zoning ordinances and planning regulations (Adler 2017 pp 52–63; Ismail et al. 2018; Kardani–Yazd et al. 2019). Most of these tools cannot be easily adopted in GKMA and other Ghanaian cities because of two significant differences between the contexts of urban sprawl in Ghana and in global North cities. First, the formal mechanisms for planning for and managing urban growth in Ghana are not as well established or widely accepted by the public as comparable frameworks in the global North. Second, municipal finance mechanisms are well-established in the global North and feature several elements that promote local autonomy and independence in securing ongoing or episodic funding for urban development. Municipal funding mechanisms in Ghana, like much of the global South, are not very well-developed and foster municipalities' fiscal dependence on state and national governments. This dependency breeds disregard for how urban expansion is financed and managed.

One tool that could be possibly useful in combating urban sprawl in GKMA is a growth boundary. In the recent past, the economic and financial benefits of developing land in the urban fringe have prompted large-scale development of peri-urban areas without sufficient infrastructure. An urban growth boundary would establish a clear demarcation between areas that could be developed and areas where development is proscribed. A growth boundary will promote compact development within the boundary and encourage the use of alternate environment-friendly means of transport such as walking and biking. To encourage adherence to an urban growth boundary, city governments can direct capital improvements to areas within the boundary and have capital improvements in areas outside the boundary. Over time this will create a difference in the level of amenities inside and outside the boundary, driving demand for homes and offices within the boundary but not outside. The lesser degree of autonomy that municipalities in Ghana as compared to their counterparts in the global North, could also allow for the use of the central government mandate to create urban growth limits. That said, the effective use of growth boundaries will require strong coordination between traditional leaders and planning authorities within the GKMA. If traditional leaders are involved in helping determine the tracts of land that would be within the growth boundary, this will create a mutual agreement between local government, planning agencies, and traditional leaders who are the custodians of lands in Ghana. Then there is a greater chance of the traditional leaders working with public agencies to dissuade development outside the boundary.

An urban growth boundary would be a hard “line in the sand” and could be challenging to demarcate and implement. A softer approach could be to formulate urban service limits, wherein municipal services such as water supply and sewerage are only provided within these limits. This would encourage residents to locate within the boundary to have access to the various services provided by the city authorities, possibly reducing demand for development on land outside the limits, thus controlling sprawl.

While the creation of new municipalities in the GKMA within the last few years could improve the efficiency of municipal services within the GKMA, turf wars between different municipalities and diseconomies of scale from lesser populations within each municipality could lead to uneven levels of service provided to GKMA residents. Fragmentation of urban governance has contributed to increasing sprawl in global North cities and is associated with uneven levels of municipal services. To prevent welfare losses, the central government of Ghana could require all municipalities in the GKMA to plan, fund, build, and manage essential infrastructure (such as water supply, and sanitation) at the regional (that is, GKMA) level rather than for each municipality. A practical example of this is described in Gerber & Phillips (2004) and Fertner et al. (2016) which systematically review and analyze the implementation of Urban Growth Boundaries (UGB) in selected cities across the United States, such as Portland. These studies assess both the benefits and challenges associated with UGBs. Even though these are not Ghanaian examples, the findings of these studies could inform serve as a valuable precedent for land management authorities in Ghana, offering insights into how this best practice could be integrated into Ghanaian land management.

Finally, the National Land Use and Spatial Planning Act, 2016 (Act 925) could be enforced. This legislation requires localities to prepare comprehensive plans, structure plans, and local plans to ensure effective and efficient urban development. Such plans would help local authorities to anticipate the future population of cities and towns, and the amount of land needed to accommodate this growth.

These measures may help manage urban sprawl, promote environmental sustainability, and minimize the financial burden on local governments tasked with providing adequate urban infrastructure, and minimize loss of agricultural and forest land to urban development. They could help facilitate the growth of resilient and sustainable cities in Ghana, where the physical expansion of urban areas balances the social, economic, and environmental aspects of development.

7. Conclusion

Cities in both the global North and South have been experiencing urban sprawl for a few decades. The negative effects of sprawl have been better controlled in developed nations than in the developing world. In this paper, we sought to shed light on the dynamics of urban sprawl in the Greater Kumasi Metropolitan Area and how it could be mitigated.

Existing literature on urban development in Ghanaian cities indicates that key drivers of urban sprawl are rapid population growth, nuclearization of the family, higher incomes, improved transportation systems, and underdeveloped planning frameworks and institutions (Cobbinah & Amoako, 2012; Owusu, 2013; Amoateng et al. 2013; Cobbinah & Aboagye, 2016; Takyi et al, 2023; Azunre et al. 2021; Tagnan et al. 2022). In Ghanaian cities, especially Kumasi Metropolis, these variables, along with political meddling in urban planning decisions, foster urban sprawl.

Urban sprawl in Ghanaian cities presents commonly known challenges: financial strain on local government, unsustainable spatial development, destruction of the green infrastructure and environmentally sensitive areas, long commutes, and traffic congestion in many urban areas (Armah et al. 2010; Battini & Boysen, 2013; Proforest, 2018; Amegah et al. 2021; Nketia et al. 2021). These adversely affect the development of resilient and sustainable cities in Ghana.

We present a few modest proposals to help local governments in Ghana to address sprawl. Our proposals are a subset of many effective sprawl control measures implemented in global North cities. These include using urban growth boundaries, urban service area limits, impact fees on new development within and around the periphery, and regional-level infrastructure provision as crucial tools for city governments in managing urban sprawl. However, the success of sprawl control measures will be significantly influenced by public and political support for them. Creating and sustaining such support is challenging and time-consuming; so, planners in Ghana need to be prepared to persevere for the long term, knowing that failure to do so would compromise the quality and livability of Ghanaian cities for many decades. Finally, the lessons in sprawl control experiments from Ghanaian cities could help inform similar efforts in other African and global South cities.

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Authors contributions

Mr. Fordjour and Dr. Anthony jointly conceived this study. Mr. Fordjour conducted the literature review, prepared the maps and tables, and wrote the first draft. Dr. Anthony added to the literature review, fleshed out the recommendations and revised the first and subsequent drafts. Mr. Fordjour conducted a larger share of the work on this paper and is its first author.

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