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## Spatial Planning in Ghana: Exploring the Contradictions

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### ABSTRACT

The purpose of this research is twofold: to explore the complexity of spatial plan preparation and implementation in Ghana using Kumasi as a case study; and second, to examine the contradictions of spatial plans and ‘actual development’ occurring in Kumasi. Using social science research methods (semi-structured interviews) and physical survey (land use plans), findings indicate that spatial planning in Kumasi is a bureaucratic process hijacked by urban planning agencies with limited involvement of urban residents. As a result, urban development is considerably influenced by spontaneous informal development patterns (i.e. self-organization). This phenomenon of self-organization is expressed in a context of uncertainty created by weak spatial planning system which encourages haphazard development. Regrettably, in Kumasi, self-organization is often overlooked by spatial planning agencies as they focused on rigid and exclusionary spatial plans. This paper advocates consideration and integration of self-organization processes in spatial planning efforts to respond adequately to the urban development challenges confronting Kumasi.

### KEYWORDS

Urban planning; Kumasi; self-organization; urban development; spatial plan

## 1. Introduction

Understanding of spatial planning revolves around outlines of abstract spatial norms and their application in space through state control measures characterized by formal, procedural and normative ideals (Alfasi & Portugali, 2007; De Roo, 2010). Globally, success stories of spatial planning are common across developed countries due to effective coordination of the urban space and configuration by state-led political economies. These success stories are, however, few in developing countries, particularly those in Africa, where there is weak state control in planning and over concentration on ‘formal’ plans (Roy, 2005; Watson, 2009; Andersen *et al.*, 2015). Spatial planning in African cities must go beyond prevailing notions of formal plan/scheme preparation to encompass the social dimensions of productive engagement and involvement of urban residents within the context of complexity—i.e.

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a reality in which spatial situations are discontinuously changing and are dependent on their context (De Roo, 2010)—uncertainty and rapid urban transformation (Korah *et al.*, 2016). Spatial planning in African cities must do more than create a series of formal plans, offering cities an opportunity to consider complexity and integrate uncertainty in such a way as to make it possible to develop and implement formal plans while making provision for self-organization as an integral part of the planning process (De Roo, 2010). This is necessary given that the availability of a formal plan does not guarantee certainty about future urban development (Korah *et al.*, 2016). In this situation, spatial planning in African cities must establish a durable sustainable base to allow urban residents to enjoy a liveable urban environment while offering socio-economic opportunities (Cobbinah *et al.*, 2015).

The study of spatial planning offers many opportunities to reflect on the importance of urban functionality and liveability, and the possibilities of considering and implementing approaches which advocate a new direction in urban development (see Fuseini & Kemp, 2015). But in Africa, there are significant obstacles including haphazard development, unplanned urbanization and complex land tenure system (Nwaka, 2005; Ubink, 2008; Nyametso, 2010; Andreasen *et al.*, 2011; Cobbinah *et al.*, 2015). Overcoming these obstacles requires more than well-intentioned formal plans; it requires a new correlation of social forces, a move towards broad-based democratic participation in all aspects of spatial planning within cities. Strategies to face these challenges must respond to the dual hurdles of overemphasizing formal plans, and de-emphasizing self-organization in the process of spatial planning.

The obstacles are an integral part of African spatial planning system, a system of increasing duality, polarized between formal plans and self-organization at the neighbourhood, city-wide and national levels (Korah *et al.*, 2016). However, cities are complex adaptive systems (CAS) open to external influences and consist of temporary structures and relationships which are in constant co-evolution, making cities fluid, unpredictable and complex (Portugali, 2006). This implies that separation between formal plans and self-organization is a recipe for informal urban development. Considering the duality of spatial planning system across African cities, it is unsurprising that informal urban development is on the ascendency (Roy, 2005; Karley, 2009; Adarkwa, 2011; Cobbinah & Amoako, 2012; Amoateng *et al.*, 2013; Oduro *et al.*, 2014; Andersen *et al.*, 2015; Cobbinah *et al.*, 2015; Cobbinah & Korah, 2015). Complicating matters further is the dominance of private ownership of land in most African cities coupled with weak planning institutions. As argued by Yeboah and Shaw (2013), conflicts between local conditions and discretions, and formal plans drive the pace and overall configuration of physical urban development in many African cities with limited adherence to spatial planning requirements.

Functionality and liveability of African cities are not possible as long as spatial planning practice continues to create a dichotomy between, and emphasized formal plans and de-emphasized self-organization in urban development. Spatial planning practice in African cities no longer needs evidence of growing clusters of informal development (e.g. slums) to suggest failure, nor need it require more legislation to guarantee functional and liveable environment. For example, Fuseini and Kemp (2015) discuss widespread availability of spatial planning and management legislations, and the presence of several urban planning agencies in Africa, particularly Ghana, while Cobbinah *et al.* (2015) report of widespread slum development across African cities—from Cape Town (South Africa) to Nairobi (Kenya) to Accra (Ghana). Yet, at present, enormous challenges continue to be generated by poor spatial planning practice in African cities; challenges that impoverish urban residents and

destabilise functionality of cities (Adarkwa, 2011; Amoateng *et al.*, 2013; Andersen *et al.*, 2015). Profound changes are required to streamline and facilitate a strategy of sustainable urban development in African cities. Before that, an understanding of the process of ‘doing’ spatial planning in Africa would provide insights into why urban development challenges persist in African cities. This paper explores this process of ‘doing’ spatial planning in Africa, suggesting that spatial planning may contribute to promoting a new form of urban dualism: a dual structure that allows complementarity between formal plans and self-organization in the process of urban development in a sustainable fashion.

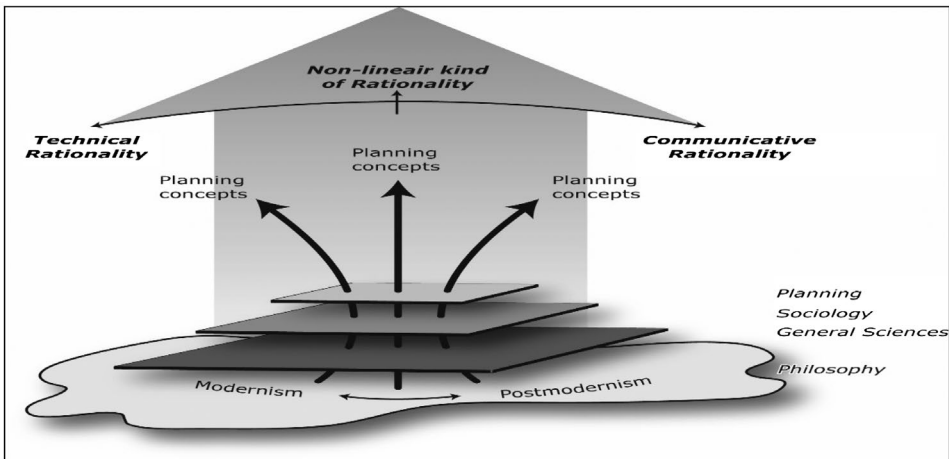
Research shows that when given the chance and access to resources, African cities are likely to be fashioned on effective spatial planning where the aspirations of urban residents are reflected in the morphology of cities and the environment protected and improved (Watson, 2009; Fuseini & Kemp, 2015). From this perspective, alternative development thinking in Africa’s spatial planning requires the recognition of the need to support the integration of formal plans and self-organization in urban development. By analysing the process of ‘doing’ spatial planning in Africa, this paper exposes the contradictions of spatial planning in African cities, using Kumasi (Ghana) as a case study, and concludes with some reflections on improving spatial planning practice in Africa.

## 2. Understanding Complexity and Uncertainty in Spatial Planning

### 2.1. Evolution of Planning Theory and Practice: A Brief Overview

Planning theory has evolved since the 1960s, focusing on strategies to address spatial problems. Prior to the 1980s, there was the dominance of ‘positivism’ (technical rational) philosophy which sought to present a view that planners have absolute control if they have all the facts and information about a phenomenon. However, this notion of positivism gradually evolved upon the realization that there cannot be a total control over a behaviour of a phenomenon such as cities. Emerging from this realization was a shift of emphasis from positivism to communicative rational planning in the late 1980s advocating agreed reality (Healey, 1996; Allmendinger, 2009). Scholarly discourse on planning theory was categorized under two broad extremes; technical rational (modern) and communicative rational (post-modern) theories (see Figure 1). The two categorization of planning theories: technical rational and communicative rational seek to portray a world in which there is certainty either through the availability of facts and information or through agreed reality.

However, the occurrence and consequences of the 2008 global financial crises led scholars (Allmendinger, 2009; De Roo, 2010, 2016) to rethink certainty in planning efforts, and to appreciate the reality that contemporary planning theory should transcend these two extremes, and consider some elements of ‘post structuralism’ and ‘complexity’. This new thinking has shaped spatial planning across the globe. Spatial planning no longer pursues certainty nor the commitment to achieve predefined future outcomes. Instead, spatial planning is increasingly focusing on the various autonomous processes (self-organization) that define urban configuration. As a consequence, earlier roles of planners as experts or mediators have evolved into acting as guides for the various actors in the urban system to optimize their interest (De Roo, 2016). This new role of planners is various, described as a transition manager (Allmendinger, 2009; De Roo, 2010) and active actor (Boonstra, 2015).



**Figure 1.** Beyond contemporary planning theory: the inclusion of non-linear development over time. Source: De Roo (2010, p. 35).

This implies embracing uncertainty and dynamism in urban transformation process, rather than strict, rigid and predefined future outcomes.

Uncertainty and dynamism are critical in today's spatial planning as constant interactions and exchange of knowledge in urban areas bring about discontinuous and unpredicted transformations. In order to understand and plan in dynamism, research on cities is frequently focusing on the uncertainty and complexity of cities—CAS. The next section throws more light on the CAS within the context of spatial planning.

## 2.2. CAS and Spatial Planning: Exploring the Link and Application

Research on cities as CAS and the implications for spatial planning abounds (e.g. Alfasi & Portugali, 2007; Rauws *et al.*, 2014). These studies describe CAS as a concept that enables discontinuous and unexpected transformations, and lie at the heart of urban development, to be acknowledged as part of development processes rather than exceptions or failures. CAS in the context of spatial planning are characterized by self-organization, co-evolution and transition (see De Roo, 2010). As self-organizing systems, CAS are able to maintain order and stability without external influence or coordination, and that the interactions within such systems lead to spontaneous emergence of a coherent spatial or organizational structure (Rauws & De Roo, 2011). In such situations, CAS consider self-organization as a *theory of spontaneous order* (De Roo, 2016) whose adaptation is influenced by contextual and internal processes (Wolfram, 2002). This means CAS recognize cities as always being in a constant reconfiguration in order to 'create the best possible fit with the environment' (Rauws *et al.*, 2014), which may not necessarily reflect a professionally designed 'formal' or spatial plan.

Co-evolution characteristic of CAS, on the other hand, refers to the continuous reformation that occurs in urban areas with future developments being unpredictable (Rauws & De Roo, 2011). The concept of co-evolution directs indulgence to the fact that changes in a system and its environment are independent (Gerrits *et al.*, 2012), and that urban morphology will constantly be altered by the various actors. These actors may also respond and adapt to turbulence and shocks urban areas experience (e.g. flooding). Co-evolution

makes urban areas resilient and robust, and prevents the realization of predetermined end goals such as long-term formal or spatial plans (Rauws & De Roo, 2011).

Similarly, CAS experience transition in their structure and function over a period of time. A transition describes a gradual, continuous process of change where the structural character of a society (or a complex sub-system of society) transforms' (Rotmans *et al.*, 2001). Transition is evident in energy systems, mobile and telecommunication and demographics. For example, the transition from a coal-based energy supply system to a gas/oil-based energy supply in developed countries like Netherlands (Verbong, 2000), is now being experienced in the developing world (e.g. Ghana) where there is evidence of gradual transition from charcoal and twigs to liquefied petroleum gas (LPG) as energy for cooking.

The conceptualization of urban areas as CAS implies that spatial planning which is regulatory, functional and normative in nature becomes limited in guiding urban transformation. A regulatory approach to planning assumes spatial plans as a statutory framework with precise and predetermined outcomes (Alfasi, 2006). Regulatory planning is based on an assumption that the government and/or planning agencies know what is good for the masses (De Roo & Porter, 2007) and that planners are viewed as helmsmen steering affairs (Allmendinger, 2009). Unfortunately, a regulatory planning relates to 'Newtonian principle' which incorrectly assumes a world of knowable reality. It is a representation of reality that is supposed to be linear and straight forward in all situations and this, in De Roo's (2010) view, cannot be, because issues such as socio-economic conditions, cultures, taste and preferences change with time, while natural occurrences are unpredictable.

Scholars (e.g. Hopkins, 2001; Hoch, 2014) have described how the perception of plans within the planning discipline has begun to change in significant ways in recent years. Spatial plans, for example, are no longer seen as precise and predictive in character but incremental and provisional by nature. Based on this reasoning, Rauws *et al.* (2014) argue that spatial plans are part of the configurations necessary to aid self-organization, and if well planned, can deliver autonomous spatial development. In furtherance, spatial planning is seen as the generation of conditions for development and the ability to support local actors' capacity to respond to changing circumstances (Rauws & De Roo, 2016).

Other authors (e.g. Andersen *et al.*, 2015; Vidyarthi, 2015) studying processes of making and implementing spatial plans in developing countries have explained how urban residents make their own plans, especially if state/city plans and formal planning frameworks fail to meet their aspirations and address their concerns. Andersen *et al.* (2015), for example, observe that urban land in Maputo (Mozambique) is configured by urban residents to fit their sociocultural dynamics. In a similar way, urban residents dictate the pace of urban development based on local conditions and discretions rather than the state in Ghana (Yeboah & Shaw, 2013). Besides, self-organization manifesting in the form of informal settlements in Ghanaian cities are triggered by contextual factors to undertake housing and sanitation infrastructure development (Nunbogu & Korah, 2016). The next section provides an understanding of self-organization and its place in spatial planning.

### **2.3. Self-Organization in Urban Development: Actor/Social Network Perspective**

Contemporary societies are in continuous change: progressing autonomously beyond planners control (De Roo, 2016). Instead of facilitating cities to agreed futures, spatial planners mostly found themselves lock-in situations driven by globalization and changing societal

behaviour (Hartman & De Roo, 2013). Self-organization is increasingly employed to analyse these autonomous behaviours of cities (see Boonstra & Boelens, 2011; Nunbogu, 2014; Korah *et al.*, 2016; Nunbogu & Korah, 2016). Self-organization is associated with complexity theories and emphasizes the spontaneous emergence of patterns or structures through the interactions between actors in a system (Heylighen, 2008). In urban development context, this implies the emergence of new spatial trajectories and/or initiatives through the interactions between actors in the city without government's coordination (Boonstra & Boelens, 2011). Fundamentally, self-organization describes situations in which a network of actors and/stakeholders contribute to urban development out of their own ambitions and interests. Through this process, individual actors learn through the interaction of multiple actors, analyse ideas and adjust their actions in response to certain contextual issues.

Self-organization has gained scholarship in contemporary planning research as a potential driver of urban transformations. In China, Zhang *et al.* (2015) illustrate how self-organizing behaviour in the real estate market in Dingxiu community resulted in a centralized urban land use pattern. Similarly, Nunbogu and Korah (2016) describe a situation of self-organization in urban development of Accra, Ghana. The aforementioned authors concluded that self-organization was context dependent with planning rules being reconstructed to guide actions of the various actors in the urban system. In the same way, Boonstra (2015) argues that planners should become actors in urban development in order to understand socio-spatial issues emerging as a result of self-organization.

### 3. Research Setting and Methods

#### 3.1. Overview of Spatial Planning in Ghana

Spatial planning functions in Ghana are performed at the national, regional and district levels (see Fuseini & Kemp, 2015 for detailed analysis on spatial planning in Ghana). The Town and Country Planning Department (TCPD)—now Land Use and Spatial Planning Authority at the national level, and Physical Planning Department at the district level—is a technical institution of the Ghana's Ministry of Environment, Science and Technology and remains the responsible body for spatial and settlement planning in Ghana. The TCPD operates through the preparation and implementation of structure and local plans. Unfortunately, recent rapid urban growth, low capacity of the TCPD, lack of institutional coordination, political interference in planning practices and complex land tenure system have rendered these plans ineffective in managing the growth and development of Ghanaian cities (Boamah *et al.*, 2012; Cobbinah & Korah, 2015; Fuseini & Kemp, 2015).

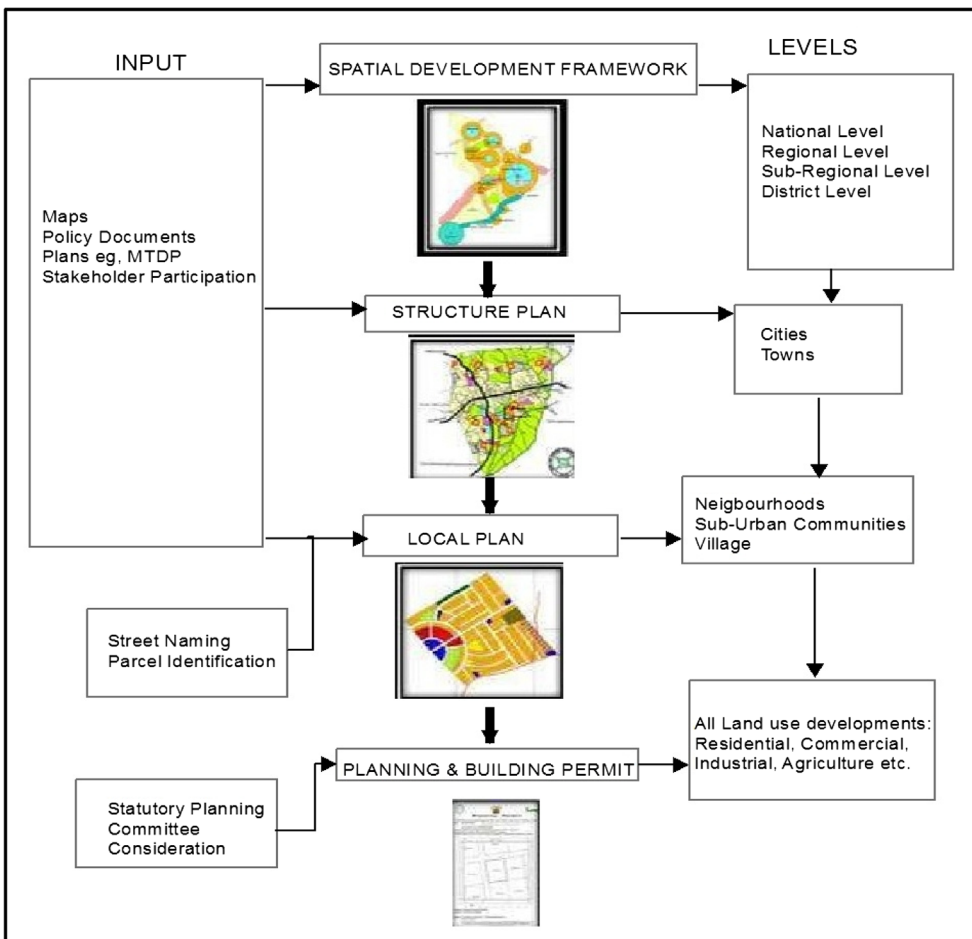
Compounding the situation further is the spatial planning legal framework expressed in the form of the Local Government Act of 1993 (Act 462), the National Development Planning Commission Act of 1994, the National Development Planning (Systems) Act of 1994 and the Town and Country Planning Ordinance of 1945. These legislations are frequently described as rigid, relic of British colonization and command and control driven discouraging local level participation. For example, the Local Government Act of 1993 (Act 462) mandates the Metropolitan, Municipal and District Assemblies (MMDA's) in Ghana to carry out spatial planning, in order to:

prohibit, abate, remove, pull down or alter so as to bring into conformity with the approved plan, a physical development which does not conform to the approved plan, or the abatement, removal, demolition or alteration of which is necessary for the implementation of an approved plan. (Local Government Act 462, 1993, section 53)



Yet, the Local Government Act of 1993 (Act 462) operates on a regulatory linear spatial plan framework assuming a world of knowable reality and disregards changing socio-economic, tastes, preferences and cultural conditions which have spatial manifestations. As discussed earlier, some authors (De Roo & Porter, 2007; Allmendinger, 2009) have highlighted the problematic nature of spatial plans to effectively managing urban development. In Ghana, although some have argued that the haphazard development of cities is the culmination of poor enforcement of development control due to limited resources (Boamah *et al.*, 2012), it is becoming increasingly clear that even if planning institutions are fully equipped in terms of power and resources, they would still be unable to effectively control the patterns of urban development because of the linear spatial plans which ignore self-organization (see Geddes 1968).

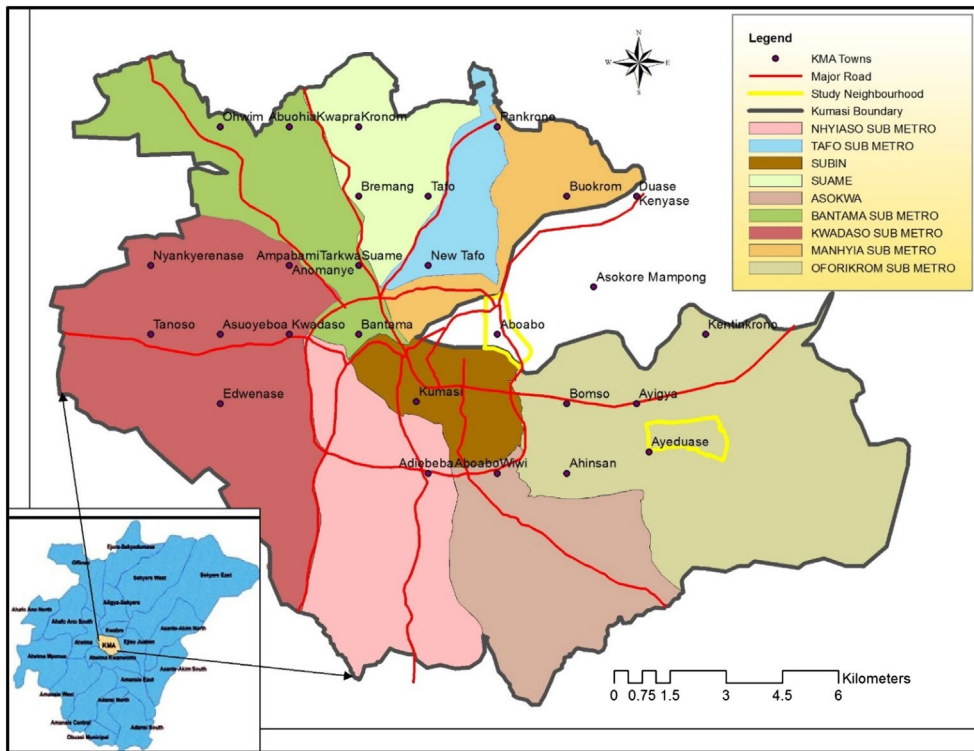
In recognition of the limitations of the linear spatial plans, the TCPD has prepared a Land Use and Spatial Planning Bill, which was passed into law only last year (2016) to replace the old legislations on regulatory spatial planning. This law is based on a three-tier planning system, involving the preparation of Spatial Development Frameworks—an indicative plan showing visions of future development over a 15–20 year period—Structure Plans and Local Plans with due diligence to self-organization (see Figure 2). This law presents a new way of encouraging greater participation and a bottom-up approach to planning.



**Figure 2.** Proposed spatial planning system.  
 Source: MEST, TCPD and JICA (2012).

### 3.2. Study Location

The city of Kumasi lies about 270 km north of Accra, the national capital of Ghana. Kumasi's land area is about 214.3 km<sup>2</sup>, and approximately 10 km in radius (Ghana Statistical Service [GSS] 2014; Kumasi Metropolitan Assembly [KMA], 2014) (see Figure 3). The last population and census report of Ghana puts population of Kumasi at 1,730,249 in 2010 (GSS, 2014; KMA, 2014). The city has undergone considerable social and economic transformation over the past decades. Changes in the demographic dynamics and economic activities are increasingly determining the configuration of development in Kumasi, which are in most cases hardly envisaged by spatial plans.



**Figure 3.** Geographical location of Kumasi.  
Source: Authors' Construct (2015).

### 3.3. Research Methods

This study is based on a research conducted in 2015 on self-organization in informal settlements in Kumasi. Recent data (2016) on urban development dynamics in Kumasi have been incorporated. The study is based on the case study method (Yin, 1994). It reviewed relevant and related literature on complexity, CAS, uncertainty and spatial planning. The literature review was undertaken at two levels: global and local. The global literature review focused on peer-reviewed articles, books and reports on complexity, urban planning, spatial

planning and CAS. Multiple search engines were used including Scopus database, Google Scholar, WorldCat and Google search, SAGE Journals online, JSTOR and CABI.

The local level literature review focused on development plans and legislations obtained from national and decentralized institutions such as the TCPD, KMA and National Development Planning Commission. Examples of these documents include the Kumasi Metropolitan Area Medium-Term Development Plan (2010–2013)' (KMA, 2014), Local Government Act, 1993 (Act 462), National Development Planning Commission Act, 1994 (Act 479), The National Development Planning (Systems) Act, 1994 (Act 480), 2012 National Urban Policy, Town and Country Planning Ordinance, 1945 (CAP 84) and Zoning guidelines and planning standards issued by the TCPD. The review of these documents was important in establishing the potential or otherwise of spatial plans in Ghana to support or constrain urban development.

Additionally, the structure plan and two local plans of Kumasi were analysed to provide insight into the effectiveness of spatial plans in guiding urban transformation and management. The structure plan was used because it remains the main spatial development framework for guiding the development of Kumasi. Due to time and resource constraints, Aboabo and Ayeduase neighbourhoods—Aboabo (close proximity to the central business district) and Ayeduase (a peri-urban community)—were purposively selected to provide a situation specific reflection of the current state of urban development in the city.

At the agency level, semi-structured interviews were conducted with officials of planning related institutions in Kumasi including KMA, TCPD, Development Planning Unit and Development Management Unit of the KMA. The semi-structured interview conversations allowed for a detailed assessment of urban development and self-organization (Sarantakos, 1998), and further provided sufficient latitude to approach different institutions while still covering the same areas of data collection (Mohd Noor, 2008). Specifically, the interviews sought to find out how urban planning institutions deal with developments that are inconsistent with approved formal/spatial plans.

In analysing the physical data, Geographic Information System (GIS) software was used to geo-reference, digitize and overlay the local plans on satellite imagery to show the usefulness or otherwise of the plan in guiding the growth of Kumasi. The interview data, on the other hand, were analysed using NVIVO 10 qualitative research analysis software. This software was used to identify key themes from the interviews including the effectiveness of spatial plans; willingness in adapting non-linear regulatory approaches; and urban transformation processes in different suburbs across Kumasi. To ensure validity and reliability of study findings, institutional interview data and spatial plans were synchronized and summary of results presented to the institutions. This process was necessary in addressing limitations and inconsistencies that had occurred.

## 4. Results and Discussion

### 4.1. Urban Development in Kumasi: Legal Framework and Planning Tools

A review of Ghana's urban planning legislations shows that the process of transformation of Kumasi is supposed to be guided by a structure plan and local plans. Interview with the institutional officials revealed that the local plans are designed by planning authorities (TCPD) based on the structure plan, and are enforced through appropriate legislations. The

purpose of local plans is to provide guidelines for urban development and the process by which these guidelines ought to be implemented. The institutional officials indicated that the content of local plans is important in relation to issues of ‘what land uses can be located’ and ‘where they should be located’. Once a local plan is approved, it becomes legally binding and a blue print for guiding urban transformation.

While it may be reasonable to argue that such strict regulatory local plans are useful to some extent (e.g. preventing occupation on marginal lands), their widespread application in the development of Kumasi appears problematic. The application of these strict local plans to Kumasi’s urban development could be related to ‘Newtonian principle’, which presents one world view of urban development where the environment can be fully controlled with certainty (see De Roo, 2010). The changing demographics and socio-economic trends in Kumasi however presents an urban development pattern which is highly unpredictable, yet the institutional and regulatory framework are still not responding to this dynamism:

... This department [TCPD] determines how physical development should proceed based on Zoning Ordinances (Planning Standards), National Building Regulations (LI 1630), National Urban Policy, Local Government Act (462) and Town and Country Planning (TCPD) Ordinance-CAP 84 ... (Kumasi Metropolitan Town Planning Official, 13 April 2015)

The above quote suggests that zoning which is based on set planning standards is used to control the spatial configuration of Kumasi’s development with discretionary powers of application lying with the KMA (TCPD) through the issue of building and development permits. By this, KMA ensures that development is carried out in accordance with the approved spatial plans deriving its authority and powers from the Local Government Act of 1993 (Act 462) and the National Building Regulation (LI 1630). Some of the provisions are:

No physical development shall be carried out in a district without prior approval in the form of written permit granted by the District Planning Authority. [Acts 462 Sec. 49 (1)]

Any person, who allocates, transfers, sells or develops land for a use or purpose that is contrary to an approved development plan, settlement structure plan, action plan or programme commits an offence. [Acts 462 Sec. 6 (12)]

A District Planning Authority may without prior notice effect or carry out instant prohibition, abatement, alteration, removal or demolition of any unauthorized development carried out or being carried out that encroaches or will encroach upon a community right of space, will interfere with the use of such spaces. [Acts 462 Sec. 55]

Yet, a review of Ghana’s urban planning legislations shows that they are largely a relic of colonization, and do not reflect the aspirations of the populace. For example, the Acts 462 provisions for regulating urban development in Kumasi can be traced back to the colonial era planning (nineteenth and early twentieth century) during which the Town and Country Planning Ordinance, 1945 (CAP 84), a principal legal framework for spatial planning in Ghana, was promulgated. Colonial urban planning was introduced by the British in response to poor sanitation and hygiene conditions in major urban areas (Quarcoopome, 1993). In this case, it was understandable to ensure strict compliance with planning standards regarding permissible and prohibited land uses. For example, industrial zones were strictly prohibited in residential zones.

Residential and industrial land uses, according to Ghana’s Town and Country Planning standards, are incompatible and should not be located in the same geographical space. However, the present reality in Kumasi is a mixture of commercial and residential uses, industrial and residential land uses and non-conformity of some emerging developments to

approved spatial plans. The non-responsiveness of existing spatial plans to the new dynamics of urban development in Kumasi is perhaps a caveat to suggest that the spatial planning framework requires a rethink with respect to the process of development and implementation of such plans.

#### **4.2. Plan Preparation Process and Implementation in Kumasi**

Kumasi Metropolitan Assembly (KMA) is the body mandated by law to prepare and implement plans for the development and growth of the city through the TCPD. Typically, structure plans—i.e. land use policy goals and guidelines for a time horizon of 15 years—and local plans (which show the land uses within a neighbourhood) are the tools for guiding urban development in Kumasi. Plan preparation in Kumasi is often initiated by the KMA, through the TCPD in consultation with Spatial Planning Committee, comprising professional planners, engineers, geographers, etc. The Spatial Planning Committee makes proposals and recommendations for the formulation of objectives for the plan.

Following from the above is the collection and analysis of household and socio-economic data. Here, the agency officials indicated that the planning authority collects, analyses and make projections for population, housing, socio-economic activities, social infrastructure, open space, capacity of roads, transport terminals and lorry parks, water needs assessment, land supply analysis (based on layers of information about existing land uses). The results from the needs assessment then inform the spatial plan or layout for the city showing: future development and land use patterns; the layout of infrastructure networks and main transportation routes, including terminals; protected areas; natural drainage system and other key features for managing the direction of development.

The process, according to the agency officials, also involves community or stakeholder consultation. It is worth mentioning that interview data show that consultations are only held after plans have been prepared. The agency officials reported that the opinions, suggestions and recommendations of stakeholders are taken into account but do not necessarily reflect in the final plan. The final decision as to what remains on the plan is the discretion of the professional planning authority (TCPD). As remarked by a senior planning officer:

... The consultation is primarily to support the planning process by enabling stakeholders to add information, make comments and proposals. It is also a way of engaging the stakeholders such that they feel they own the process. The proposals made by the stakeholders only act as guide for our work ... Kumasi Metropolitan Town Planning Official, 13 April 2015

This statement presupposes that other actors in the urban system such as developers, land owners, urban residents and investors have little influence on the design of spatial plans in Kumasi. The agency officials admitted that the process of plan preparation is normative with little concern for uncertainty and self-organizing behaviours in the city. This may explain why other actors particularly land owners frequently tend to contract surveyors to prepare spatial plans for their areas of jurisdiction (see Cobbinah & Darkwah, 2016).

After the stakeholder engagement process, the final structure plan is designed by the TCPD and approved by the KMA for implementation. To implement the structure or city-wide plan, local plans are prepared based on the proposals in the structure plan for the various neighbourhoods in the city. Interview results indicate that individuals and developers are required by law (Act 462) to acquire development and building permits from the planning authority (TCPD) in order to undertake any development or change of use.

However, as a result of weak institutional capacity, poor monitoring and development control, it is unsurprising that autonomous urban development in Kumasi is on the ascendency (see Amoateng *et al.*, 2013; Cobbinah & Korah, 2015; Korah *et al.* 2016).

### **4.3. Structure Plans and Urban Morphology of Kumasi**

Kumasi has undergone several political, cultural, physical and demographic transitions over the last hundred years (Amoako & Koboe, 2011). These changes have shaped the present structure and function of the city. Given British colonization of Ghana (Fuseini & Kemp, 2015), strict Town Planning Standards to ensure planned development were enforced by the British. However, following Ghana's independence in the late 1950s, land ownership was returned to the traditional authorities (chiefs) and people of Kumasi. The implication was that, although official plans were prepared to guide the development of Kumasi, urban development, particularly physical development, was individual driven which created chaotic urban configurations (see Korboe & Tipple, 1995).

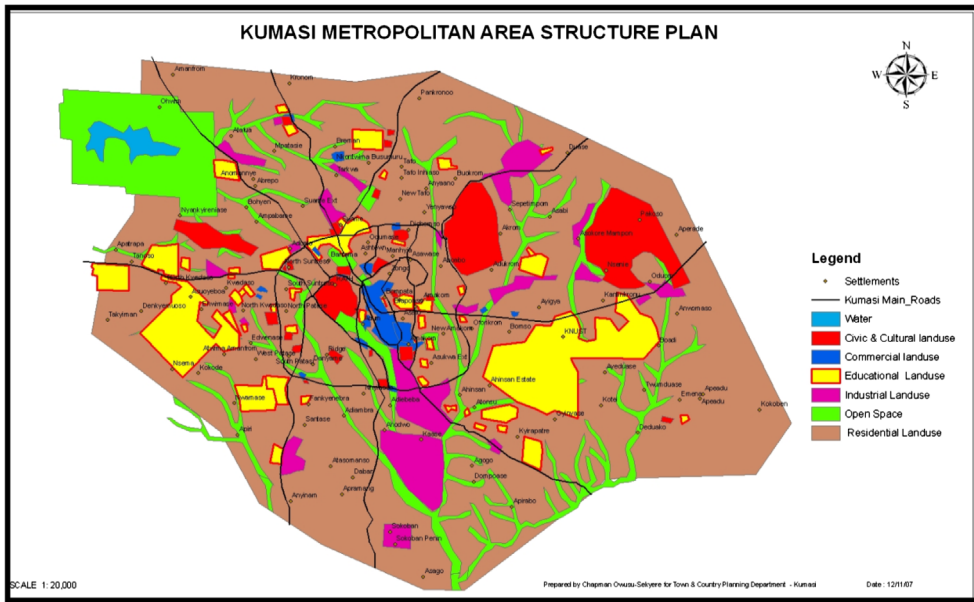
Since the end of the first decade of the twenty-first century, more than 80% of new buildings in the city of Kumasi lacked approval and were unauthorized (Freiku, 2013). This is corroborated by Amoako and Koboe (2011), who observe that a number of physical developments in the city do not conform to the existing plan. The influx of migrants and increasing demographic growth of Kumasi are frequently discussed as fundamental reasons. Also, the increasing unplanned petty trading and informal businesses, coupled with the lack of consideration for their space requirements in formal/spatial plans have contributed to encroachment of public open spaces and in the city (Afrane & Ahiable, 2011). There is always uncertainty about how independent actors (developers, urban residents) in an urban system will act in response to changing conditions (e.g. socio-economic, institutional and environmental) even when there is a formal plan. The 'becoming' aspect of urban areas (how these areas will co-evolve) in terms of structure and function, in most cases remains 'undefined' and non-linear (see Zhang *et al.* 2015).

As shown in Figure 4, the current structure plan of Kumasi provides certainty for developers and protects public interest by showing distinct land uses, permissible and non-permissible areas for development and nature reserves. However, the reality in Kumasi is a mixture of commercial and residential land uses, industrial and residential land uses (see Cobbinah & Aboagye, 2017). The foregoing suggests that socio-economic, cultural, institutional, political, and physical factors are not static, frozen and in an equilibrium state. These factors change with time, and are dynamic. Unfortunately, the current structural plan designed on the basis of facts and information without recourse to self-organization failed to consider these dynamics. The current plan does not provide room for manoeuvrability whenever there are contextual changes.

### **4.4. Local Plan and Neighbourhood Transformation in Kumasi: The Case of Aboabo and Ayeduase Neighbourhoods**

#### **4.4.1. Aboabo Neighbourhood**

Aboabo is a slum community in Kumasi characterized by poor sanitary conditions, large household sizes, poor provision of utility services, sub-standard buildings, congestion and unapproved extension of buildings (Amoako & Cobbinah, 2011). The reality in Aboabo

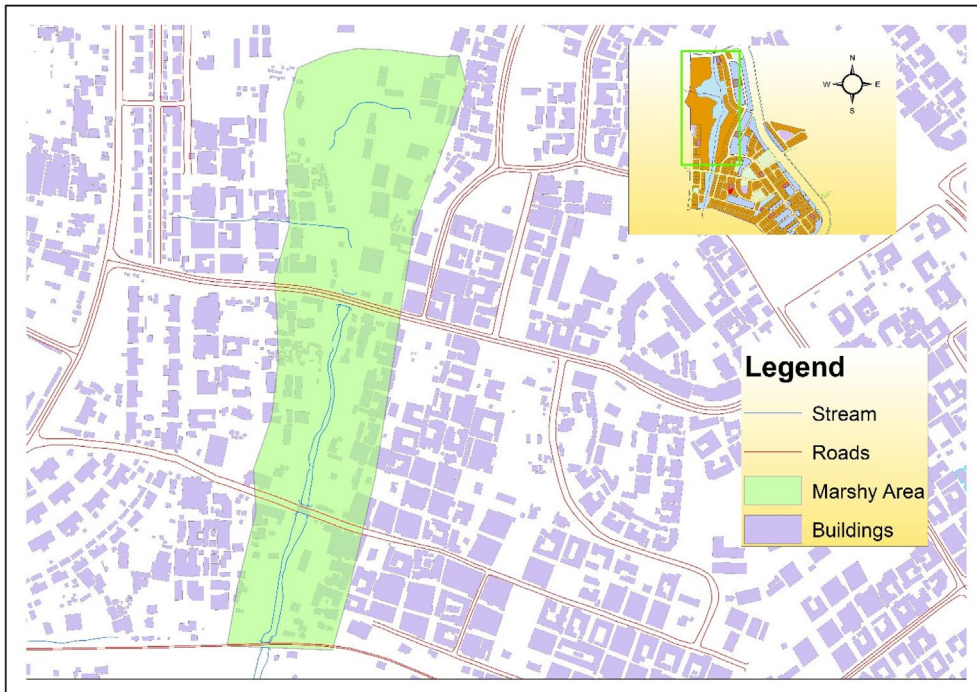


**Figure 4.** Structure spatial plan of Kumasi (2010).  
Source: KMA (2014).

is a contradiction of the urban configuration envisioned in the existing spatial plans and supporting legislations. A number of urban developments are evolving autonomously—in floodplains (see Figure 5), notwithstanding the adoption of a local plan to guide these developments (see Figure 6). Aboabo remains one of the densely-populated suburbs in Kumasi with average household size of about six persons compared to the city-wide average of five persons. Individuals as intelligent adaptive agents have resorted to self-organization as means of meeting their housing need. This was reported by the agency officials as a reason for the spontaneous land use patterns despite the local plan.

It is reported that over 80% of the economic activities in Aboabo are informal, including hairdressing, catering, dressmaking, hawking, among others (Amoako & Cobbinah, 2011). Regrettably, there is no conscious effort by the planning authority (TCPD and KMA) to spatially plan for these activities (see Boapeah, 2001; Afrane & Ahiable, 2011) or at least involve informal service providers in planning of their neighbourhoods. As a consequence, and through self-organization, these informal activities have naturally found expression in space. This reinforces the argument that CAS have the capability to alter a predefined environment to meet emerging need or to survive (Wadhawan, 2013).

Many of the informal service providers operate in unauthorized and makeshift structures and in open spaces across Aboabo, which do not provide security and ensure sustainability of their services. Regrettably, these informal service providers remain the target of KMA eviction and digestion exercises (see Cobbinah & Darkwah, 2016). This is unsurprising as agency interviews revealed that the planning authorities in Kumasi lack adequate personnel and logistics to carryout comprehensive socio-economic survey of residents prior to plan preparation. Figure 6 shows the local plan of Aboabo, which is supposed to guide the development of Aboabo. In summary, the local plan was designed to make Aboabo accessible, aesthetically pleasing and ensure public safety through the alignment of roads and organization of land

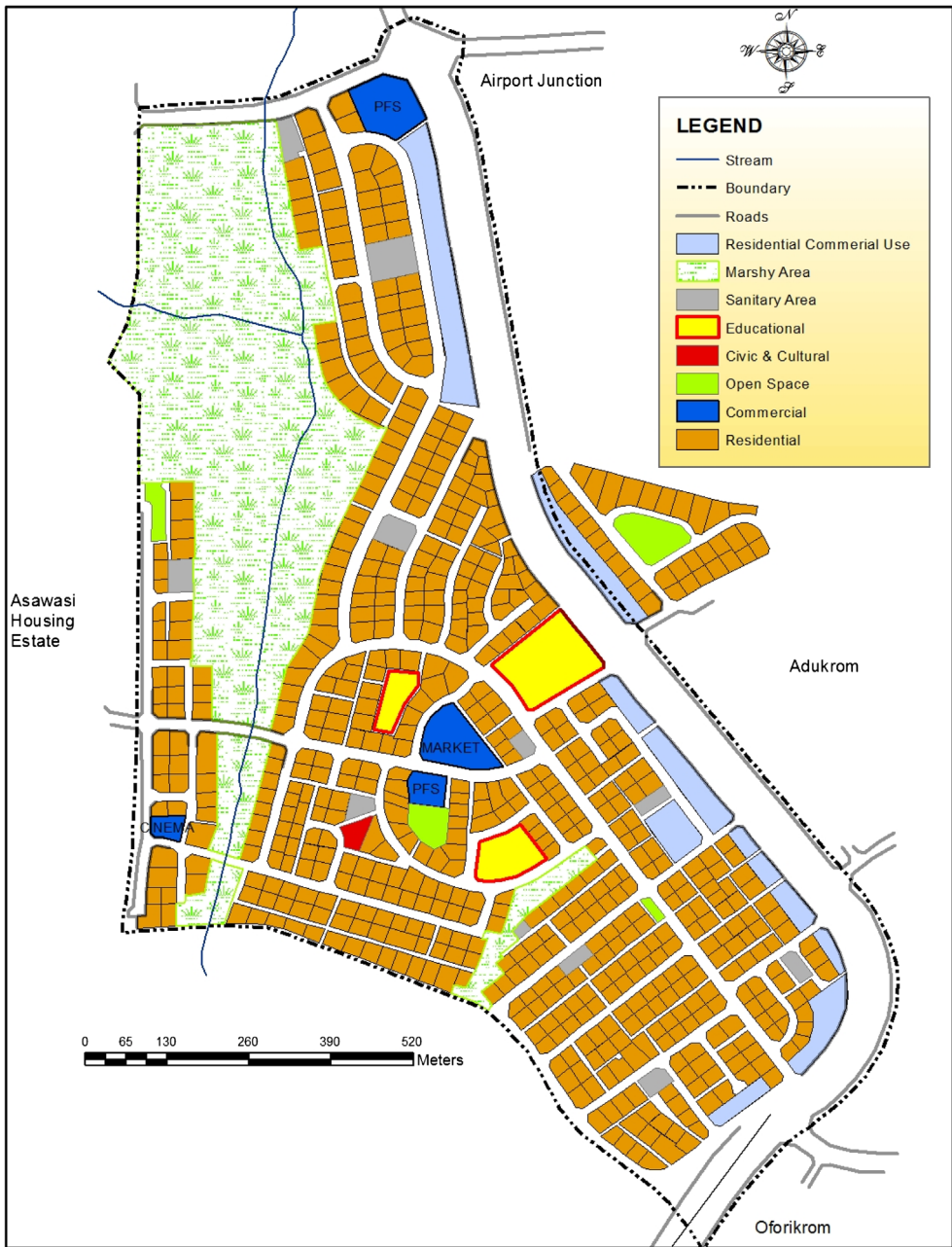


**Figure 5.** Buildings located in marshy area to the west of Aboabo.  
Source: Based on field work (2015).

uses. Certain areas were earmarked as non-permissible for development because they were susceptible to flooding and vulnerable. However, field observations showed that a number of buildings have sprung up in the floodable area (see Figure 5). An overlay of the local plan and satellite imagery of Aboabo shows buildings developed in the marshy area (see Figure 7). Further to the development in floodable zones is the unauthorized redevelopment and extension of existing buildings which obstructs and narrows the road reservations (see Figure 8).

The result of these actions and initiatives by urban residents on the spatial or functional layout of Aboabo, may or may not contribute to meeting the targets of the local plan. The self-organizing process has both positive and negative consequences. On the positive side, redevelopment and unauthorized extension of buildings in Aboabo has contributed to increasing the housing stock. This practice of unauthorized extension is also a means of meeting the space requirement of informal activities in Aboabo, which are often not included in spatial plans (see Anokye *et al.*, 2014). The negative implication, on the other hand, relates to reduced accessibility as result of encroachment on road reservations, destruction of utility lines for water, and illegal connections of power and water to cater for their livelihood activities (see Korah *et al.*, 2016). The situation in Aboabo is a reflection of urban development in Kumasi which emerges from the interaction between planned (spatial plans) and autonomous (self-organization) processes at various scales, time and space. Findings from this research corroborates those of previous studies (Yeboah & Shaw, 2013; Andersen *et al.* 2015; Vidyarthi, 2015), which found that individuals make their own plans, especially if state plans and formal planning frameworks fail to address their requirements and concerns. The findings also support the view that self-organization is



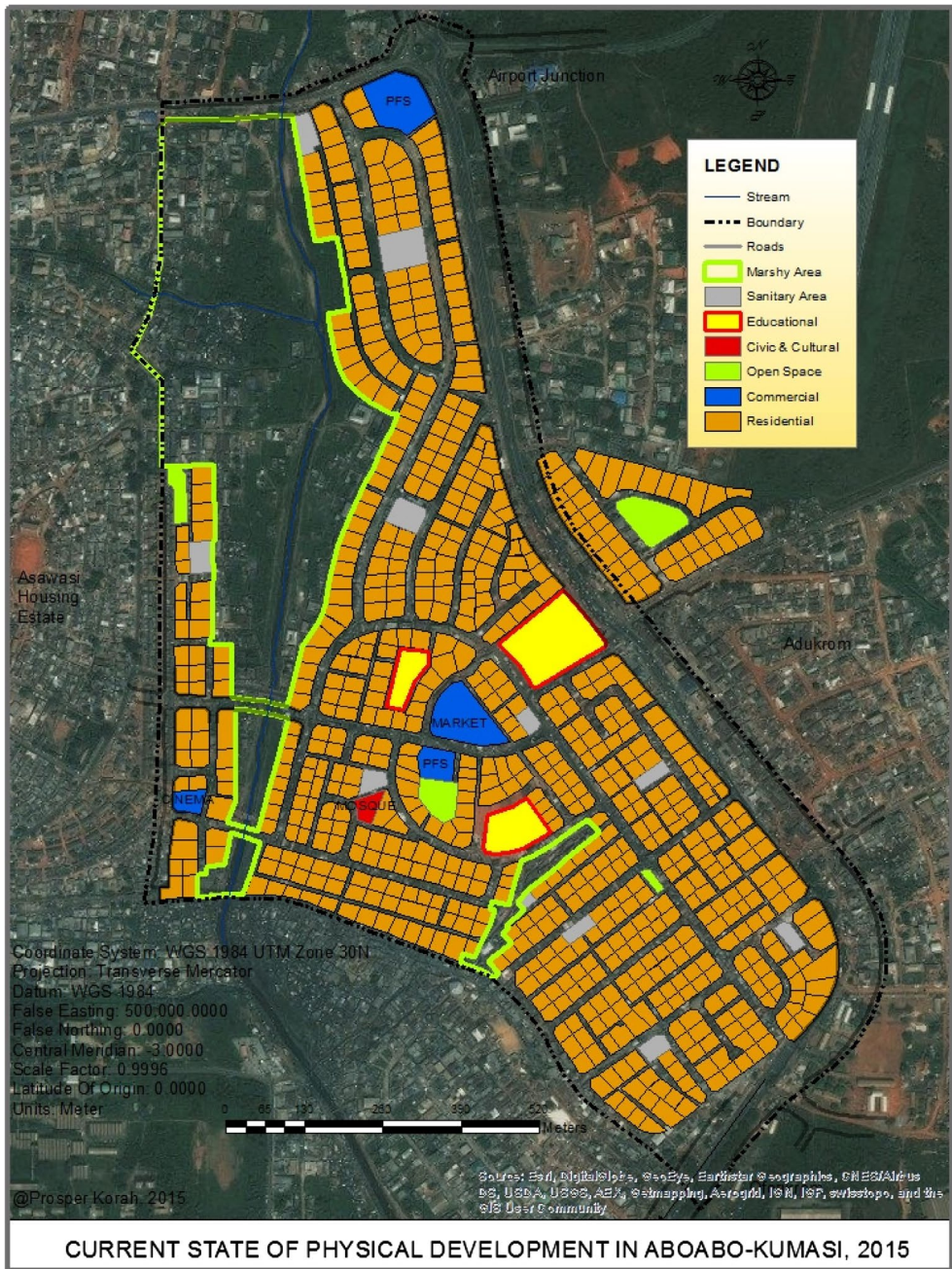


**Figure 6.** Local plan of Aboabo (1980).  
 Source: Based on TCPD (2015).

context specific and so planning should support the adaptive capacity of local actors (see Nunbogu & Korah, 2016).

**4.4.2. Ayeduase Neighbourhood**

Ayeduase is a peri-urban neighbourhood in Kumasi located close to the Kwame Nkrumah University of Science and Technology and exhibits both the characteristics of autonomous



**Figure 7.** Overlay of Aboabo local plan on satellite imagery  
 Source: Based on field work (2015).

and a well-planned neighbourhood. The autonomously developed areas are found at the core of the community, whereas the outskirts are orderly developed. In 2003 when the spatial plan was designed, the core area was made up of mainly residential land use (see Figure 9). Interviews with agency officials indicate that the dominance of residential land use in Ayeduase in 2003 was due to the increasing need for housing with less regard for



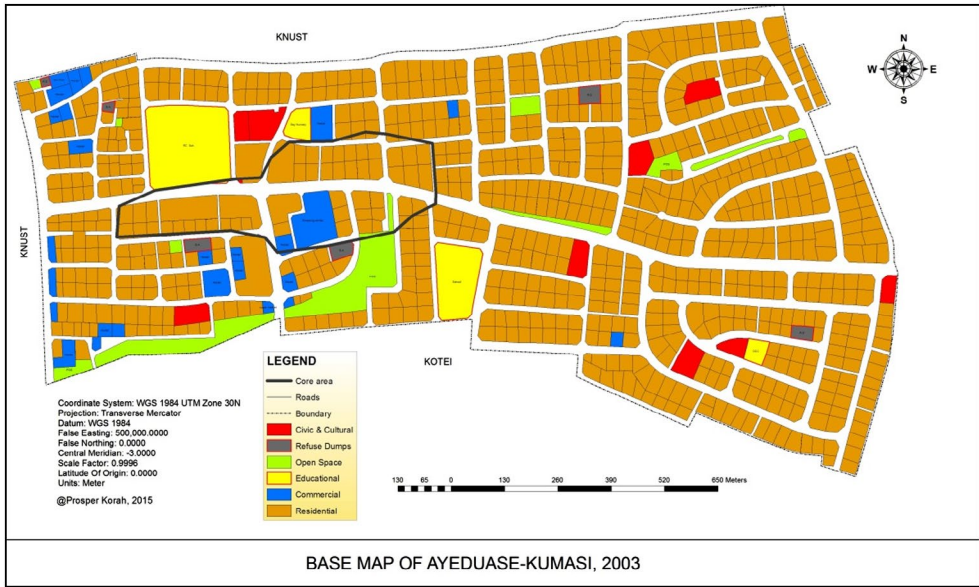
**Figure 8.** Unauthorized extension of buildings to the south of Aboabo.

Source: Based on field work (2015).

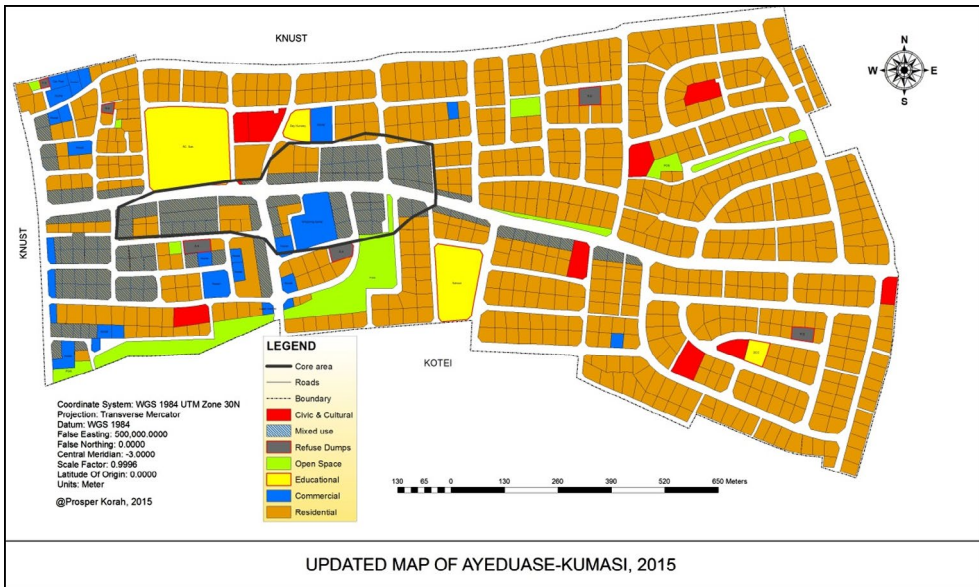
other uses. This situation, however, has changed over the past decade. The agency officials mentioned the community's close proximity to the university as a major influence on land use changes. The proximity of Ayeduase to the university has led to the proliferation of commercial activities such as printing shops and restaurants to meet the demand of students and staff. However, the local plan of Ayeduase (Figure 9) did not make provisions for these uncertainties and changes.

As illustrated in Figure 10, the current land use patterns in Ayeduase are conflicting to the patterns envisioned in its 2003 local plan. For example, areas originally designated for residential use (see Figure 9) have now been converted into commercial and mixed use uses whereas open spaces and watercourses have been encroached upon by developers and resident (see Figure 11). The differing realities between what is on the local plan and actual development expose the limitations associated with the former due to inflexibility juxtaposed with Ayeduase self-organizing in response to on-going socio-economic change. Notwithstanding the linear nature of spatial plans, another reason that could be attributed to the variance in land use patterns in Ayeduase and existing spatial plans may be the conflicting nature of the planning regulations:

Where a person submits an application for a building permit, the District Planning Authority shall notify him within seven (7) days of the receipt of the application and shall within a period of 3 months thereafter notify the applicant whether the application is granted or refused. An applicant not informed of the grant or refusal of the application may after the expiry of the 3 months commence development on the basis that application is acceptable to the District Planning Authority. [LI 1630 Sec. 8 (1, 2)]



**Figure 9.** Base map of Ayeduase.  
Source: Based on fieldwork (2015).



**Figure 10.** Current state of development in Ayeduase.  
Source: Based on field work (2015).

The above provision contradicts Section 55 of the Local Government Act of 1993 (Act 462), which gives the Planning Authority power to demolish any structure that does not conform to the approved scheme. In effect, the inconsistencies in the regulatory framework for urban planning limit its ability to support urban transformation in Kumasi. On the other hand,



**Figure 11.** A building in an open space in Ayeduase.

even if these regulations were to be integrated and the planning institutions working in a coordinated manner, it would still be difficult to control Kumasi's development by a linear approach (see Geddes, 1968; Albrecht, 2004) as the city has become very dynamic and difficult to predict future trends.

#### **4.5. Theoretical and Empirical Reflections**

The literature and empirical results from this study show the contradictions of spatial planning in Ghana, particularly Kumasi. Although the transformation of Kumasi has been influenced by political, cultural and socio-economic and demographic factors which are consistent with CAS, the manner in which spatial planning is occurring is opposing to the CAS philosophy of not strictly maintaining order and stability without external influence (Alfasi and Portugali, 2007). CAS are believed to have the capacity to evolve autonomously without central guidance (Rauws *et al.*, 2014). The Aboabo neighbourhood case shows how individuals (actors) made illegal extensions to houses which are blocking and narrowing access roads. If such a development is unchecked, in the near future, accessibility would be limited in Aboabo with increased disaster risk (e.g. fire outbreak). Furthermore, many physical structures were found in watercourses in Aboabo and this trend has been reported to be a major cause of recent floods in Kumasi (e.g. Owusu-Ansah, 2015). This presupposes that some form of robustness through enforcement of planning standards need to be maintained in spatial planning, by actively engaging with urban residents. This will ensure complementarity between spatial plans and self-organization which may perhaps guarantee the protection of marginal lands and areas susceptible to flooding in Kumasi.

As earlier discussed, Kumasi has fundamentally changed in terms of population, culture and socio-economic activities. These changes masterminded the form and configuration of spatial development (structure and function) of Kumasi. From the demographic point of view, the population has increased from about 460,000 people in 1984 to nearly 2 million in 2010. In socio-economic terms, the trend has been the increase in the number of informal and commercial activities. In the year 1954, about 54% of the labour force in Kumasi was engaged in the informal sector and this increased to about 70% in 2011 (Afrane & Ahiabile,

2011) and is expected to rise again in the foreseeable future. The structure and function of Kumasi therefore continue to co-evolve jointly to match these changing demographics and socio-economic trends.

Unfortunately, the planning system in Kumasi is uncompromising to the changing demographics, socio-economic and political situations. There are strict and generic planning standards that are applied irrespective of place (e.g. informal settlements). These planning standards eventually proved limited in effectively guiding the growth and development of Kumasi as certain neighbourhoods (e.g. Aboabo) lack basic infrastructure and minimum housing qualities. As a result, the poor are forced to settle in undesirable lands and areas zoned as nature reserves (see Aboabo case). This presupposes that urban development is a culmination of the interaction between institutions and self-organization (Zhang *et al.*, 2015). Spatial plans should then be part of the configurations necessary to assist self-organization in urban development (Rauws *et al.*, 2014). These spatial plans however, require some robustness through central guidance in order to prevent undesirable landscapes (e.g. urban structures in watercourses and slums). The implication is that: spatial plans must be adapted to specific neighbourhoods in Kumasi according to the characteristics of these neighbourhoods. The net effect is that conditions should perhaps become more important in certain cases rather than content and process in spatial planning.

## 5. Conclusion

An analysis of Kumasi's structure plan and the transformation of two neighbourhoods (Aboabo and Ayeduase) based on CAS perspective reveals the contradictions of spatial plans and self-organization. Unfortunately, self-organization, which is unpredictable, is the dominant form of urban development occurring in Kumasi. The generic and strict standards that characterized spatial planning in Kumasi are being tested by self-organizing developments. Yet, self-organization is not considered essential in spatial planning framework in Kumasi by planning authorities. Given the present situation, there is the need for an increased recognition of self-organizing processes as integral part of spatial planning practice. Planning authorities' efforts towards addressing contradictions in spatial planning could be through adopting flexible plans, creating variable sectors, and developing strategic plots and mixed land uses, which are explained in the following paragraphs.

In adopting flexible plans, findings from this research show that the Ayeduase local plan lacked flexibility to respond to contextual interference, resulting in a considerable departure from actual development on the ground. Flexibility could be incorporated through multiple realities in designing plans by relaxing certain aspects of the planning standards to allow for mutual independency between spatial plans and self-organization. For example, instead of designing spatial plans that are implemented based on strict and generic standards, spatial plans can be retrofitted to neighbourhoods according to the characteristics of these neighbourhoods. This means involvement of the actors (e.g. citizens) of informal settlements in the planning process through formal consultations and socio-economic surveys, so that planning authorities in Kumasi are informed about the needs and space requirements of these residents. This will serve as the basis for integrating the informal sector into spatial and opportunity for informal settlements in Kumasi to co-evolve, innovate, adapt and survive in a changing and competitive world (Korah *et al.*, 2016).

Creating variable sectors means that zoning regulations and planning standards for a given use of land are determined but do not show the specific location on the map. This is feasible for areas that have not been developed yet. For example, according to the planning standards (Ghana), a low density (or high class) residential area is supposed to contain 88 persons per hectare (maximum). On the land use plan, this area could be designed and developed anywhere provided it does not conflict with other land uses. It is important to clarify some uses that could have specific location on the map in order to avert this conflict and ensure safety and public interest. These land uses include, fuel/gas filling stations, heavy industries, education, sanitary areas, nature reserves and open spaces. These land uses should have exact locations on the map and enforced through robust standards. The other land uses such as commercial, residential, civic and cultural should be floating and the development of these can occur anywhere on the map but also in accordance with the zoning regulations. Through the creation of variable zones, the urban area will have the capacity to adapt and co-evolve in times of socio-economic changes and technological advancement.

Strategic development could also allow a number of land uses to co-exist and mutually support each other. With this, the nature and form of land development would be indeterminate. This would allow for instance, small scale commercial activities to be interspersed with residential development and also promote novelty. This means that the market and prevailing contextual factors such as socio-economic and cultural tastes and preferences will determine the nature and overall configuration of development in an area. Areas would also have the opportunity to redevelop whenever necessary. Adopting this approach can save planning authorities time and efforts in assessing numerous applications for change of use and redevelopment, which is the result of inflexible spatial plans. The challenge of this approach is premised on two fundamental questions; 'Would this approach not lead to undesirable skylines?' and 'Can a plan based on this orientation be able to enhance the quality of neighbourhoods?' Reflecting on these concerns, the solution perhaps might be for the various actors in the planning and development of Kumasi to understand that planning rules and self-organizing behaviours are interdependent (Zhang *et al.*, 2015). This means greater collaboration and participation in the planning process.

## Disclosure Statement

No potential conflict of interest was reported by the authors.

## References

- Adarkwa, K. K. (2011) *Future of the Tree Towards Growth and Development of Kumasi* (Kumasi: University Printing Press, KNUST).
- Afrane, S. & Ahiable, G. (2011) The informal economy and microfinance in Kumasi, in: K. K. Adarkwa (Ed) *The Future of the Tree: Towards Growth and Development of Kumasi*, pp. 111–127 (Kumasi: University Printing Press, KNUST).
- Albrechts, L. (2004) Strategic (spatial) planning reexamined, *Environment and Planning B: Planning and Design*, 31(5), pp. 743–758.
- Alfasi, N. (2006) Planning policy? Between long-term planning and zoning amendments in the Israeli planning system, *Environment and Planning A*, 38(3), pp. 553–568.
- Alfasi, N. & Portugali, J. (2007) Planning rules for a self-planned city, *Planning Theory*, 6(2), pp. 164–182.
- Allmendinger, P. (2009) *Planning Theory* (London: Palgrave, Mac Millan).

- Amoako, C. & Cobbinah, P. B. (2011) Slum improvement in the Kumasi metropolis, Ghana – A review of approaches and results, *Journal of Sustainable Development in Africa*, 13(8), pp. 150–170.
- Amoako, C. & Koboe, D. (2011) Historical development, population growth and present structure of Kumasi, in: K. K. Adarkwa (Ed) *Future of the Tree; Towards Growth and Development of Kumasi*, pp. 35–54 (Kumasi: University printing press, KNUST).
- Amoateng, P., Cobbinah, P. B. & Owusu-Adade, K. (2013) Managing physical development in peri-urban areas of Kumasi, Ghana: A case of Abuakwa, *Journal of Urban and Environmental Engineering*, 7(1), pp. 96–109.
- Andersen, J. E., Jenkins, P. & Nielsen, M. (2015) Who plans the African city? A case study of Maputo: part 1 – The structural context, *IDPR*, 37(3), pp. 329–350. doi:10.3828/idpr.2015.20.
- Andreasen, J., Andersen, J. A. & Inkoom, D. K. B. (2011) Land and revenue in a traditional town in Ghana: The case of the Nkwanta sub-division in Mpasatia, *International Institute for Environment and Development (IIED)*, 23(2), pp. 539–561.
- Anokye, P. A., Afrane, S. K. & Oduro-Ofori, E. (2014) The informal apprenticeship system in Ghana: Post graduation job integration and its implications for the management of urban space, *Journal of Environment and Earth Science*, 4(18), pp. 84–93.
- Boamah, N. A., Gyimah, C. & Bediako Nelson, J. K. B. (2012) Challenges to the enforcement of development controls in the Wa municipality, *Habitat International*, 36(1), pp. 136–142.
- Boapeah, S. (2001) The informal economy in Kumasi, in: K. K. Adarkwa & J. Post (Eds) *The Fate of the Tree: Planning and Managing the Development of Kumasi, Ghana*, pp. 59–77 (Accra: Woeli Publishing Services).
- Boonstra, B. (2015) *Planning Strategies in an Age of Active Citizenship; A Post-Structuralist Agenda for Self-Organization in Spatial Planning* (Groningen: InPlanning).
- Boonstra, B. & Boelens, L. (2011) Self-organization in urban development: Towards a new perspective on spatial planning, *Urban Research & Practice*, 4(2), pp. 99–122. doi:10.1080/17535069.2011.579767.
- Cobbinah, P. B. & Aboagye, H. N. (2017) A Ghanaian twist to urban sprawl. *Land Use Policy*, 61, pp. 231–241. doi:10.1016/j.landusepol.2016.10.047.
- Cobbinah, P. B. & Amoako, C. (2012) Urban sprawl and the loss of peri-urban land in Kumasi, Ghana, *International Journal of Social and Human Sciences*, 2(6), pp. 388–397.
- Cobbinah, P. B. & Darkwah, R. M. (2016) Urban planning and politics in Ghana, *GeoJournal*, pp. 1–17. doi:10.1007/s10708-016-9750-y.
- Cobbinah, P. B. & Korah, P. I. (2015) Religion gnaws urban planning: The geography of places of worship in Kumasi, Ghana, *International Journal of Urban Sustainable Development*, pp. 1–17. doi:10.1080/19463138.2015.1074581.
- Cobbinah, P. B., Erdiaw-Kwasie, M. O. & Amoateng, P. (2015) Africa's urbanisation: Implications for sustainable development, *Cities*, 47, pp. 62–72.
- De Roo, G. (2010) Planning and complexity: An introduction, in: G. de Roo & E. A. Silver (Eds) *A Planner's Encounter with Complexity*, pp. 1–18 (Farnham: Ashgate).
- De Roo, G. (2016) Self-organization and spatial planning: Foundations, challenges, constraints and consequences, in G. de Roo & L. Boelens (Eds) *Spatial Planning in a Complex Unpredictable World of Change*, pp. 54–96 (Groningen: InPlanning).
- De Roo, G. & Porter, G. (2007) *Introducing Actor-Consulting as a Means to Address Fuzziness in Planning and Decision-Making*, in *Fuzzy Planning* (Farnham: Ashgate).
- Freiku, S. R. (2013, May 20). JICA Presents Report on Development Plan for Greater Kumasi. [Ghanaian-Chronicle.com](http://Ghanaian-Chronicle.com).
- Fuseini, I. & Kemp, J. (2015) A review of spatial planning in Ghana's socio-economic development trajectory: A sustainable development perspective, *Land Use Policy*, 47, pp. 309–320. doi:10.1016/j.landusepol.2015.04.02.
- Geddes, P. (1968) *Cities in Evolution* (London: Ernest Benn Ltd).
- Gerrits, L. (2012) *Punching Clouds: An Introduction to the Complexity of Public Decision-Making* (Litchfield Park, AZ: Emergent).
- Ghana Statistical Service (GSS) (2014) *2010 Population and Housing Census. District Analytical Report, Kumasi Metropolis* (Accra: Ghana Statistical Service).



- Hartman, S. & De Roo, G. (2013) Towards managing nonlinear regional development trajectories, *Environment and Planning C: Government and Policy*, 31(3), pp. 556–570.
- Healey, P. (1996) The communicative turn in planning theory and its implications for spatial strategy formations, *Environment and Planning B: Planning and Design*, 23(2), pp. 217–234.
- Heylighen, F. (2008) Complexity and self-organization, in: M. J. Bates & M. N. Maack (Eds) *Encyclopedia of Library and Information Sciences*, pp. 1–20 (London: Taylor and Francis).
- Hoch, C. (2014) Utopia, scenario and plan: A pragmatic integration, *Planning Theory*, 16(1), pp. 1–17. doi:10.1177/1473095213518641.
- Hopkins, L. D. (2001) *Urban Development: The Logic of Making Plans*. (Washington, DC: Island Press).
- Karley, N. K. (2009) Flooding and physical planning in urban areas in West Africa: Situational analysis of Accra, Ghana, *Theoretical and Empirical Research in Urban Management*, 4(3), pp. 25–41.
- Koboe, D. & Tipple, A. G. (1995) Kumasi city profile, *Cities*, 12(4), pp. 267–274.
- Korah, P. I., Cobbinah, P. B., Nunbogu, A. M. & Gyogluu, S. (2016) Spatial plans and urban development trajectory in Kumasi, Ghana, *GeoJournal*, pp. 1–22. doi:10.1007/s10708-016-9731-1.
- Kumasi Metropolitan Assembly (2014) Available at [https://www.kma.ghanadistricts.gov.gh/?arrow=atd&\\_=6&sa=5490](https://www.kma.ghanadistricts.gov.gh/?arrow=atd&_=6&sa=5490) (accessed 7 October 2014).
- MEST, TCPD & JICA (2012) *A Study on Comprehensive Urban Development Plan for Greater Kumasi, Interim Report* (Kumasi: Town & Country Planning Department).
- Mohd Noor, K. B. (2008) Case study: A strategic research methodology, *American Journal of Applied Sciences*, 5(11), pp. 1602–1604.
- Nunbogu, A. M. (2014) Self-organisation in informal settlements. A case study of the greater Accra metropolitan area, Ghana, Masters thesis, University of Groningen. Available at <https://irs.ub.rug.nl/dbi/54215e0ff07dc>.
- Nunbogu, A. M. & Korah, P. I. (2016) Self-organisation in urban spatial planning: Evidence from the Greater Accra Metropolitan Area, Ghana, *Urban Research & Practice*, pp. 1–19. doi:10.1080/17535069.2016.1238502.
- Nwaka, G. (2005) Planning for sustainable cities in Africa, in U. Okechukwu & O. G. Afoaku (Eds) *Sustainable Development in Africa. A Multifaceted Challenge*, pp. 120–138 (Asmara, Eritaria: Africa World Press, Inc).
- Nyametso, J. K. (2010). *Improvement of Squatter Settlements: The Link Between Tenure Security, Access to Housing, and Improved Living and Environmental Conditions*. Available at <https://www.otago.ourarchive.ac.nz> (accessed 4 February 2014).
- Oduro, C. Y., Ocloo, K. & Peprah, C. (2014) Analyzing growth patterns of greater kumasi metropolitan area, using GIS and multiple regression techniques, *Journal of Sustainable Development*, 7(5), pp. 13–31.
- Owusu-Ansah, J. K. (2015) The influences of land use and sanitation infrastructure on flooding in Kumasi, Ghana, *GeoJournal*, 81(4), pp. 555–570. doi:10.1007/s10708-015-9636-4.
- Portugali, J. (2006) Complexity theory as a link between space and place, *Environment and Planning A*, 38(4), pp. 647–664. doi:10.1068/a37260.
- Quarcoopome, S. S. (1993) A history of the urban development of Accra: 1877–1957, *Research Review*, 9(1–2), pp. 20–32.
- Rauws, W. & De Roo, G. (2016) Adaptive planning: Generating conditions for urban adaptability. Lessons from Dutch organic development strategies, *Environment and Planning B: Planning and Design*, pp. 1–23. doi:10.1177/0265813516658886.
- Rauws, W. S., Cook, M. & Van Dijk, T. (2014) How to make development plans suitable for volatile contexts, *Planning Practice & Research*, 29(2), pp. 133–151.
- Rauws, W. S. & De Roo, G. (2011) Exploring transitions in the peri-urban area, *Planning Theory & Practice*, 12(2), pp. 269–284.
- Rotmans, J., Kemp, R. & van Asselt, M. (2001) More evolution than revolution: Transition management in public policy, *Foresight*, 3(1), pp. 15–31.
- Roy, A. (2005) Urban informality: Toward an epistemology of planning, *Journal of the American Planning Association*, 71(2), pp. 147–158. doi:10.1080/01944360508976689.
- Sarantakos, S. (1998) *Social Research* (London: McMillan).

- Ubink, J. M. (2008) *In The Land of the Chiefs: Customary Law, Land Conflicts, and the Role of the State in Peri-Urban Ghana* (Leiden: Leiden University Press).
- Verbong, G. (2000). *The Dutch Government and Energy Transitions: A Historical Perspective. Research Document for the Report Transitions & Transition Management, the Case for an Emission Free Energy Supply* (Rotmans et al., 2000) (The Netherlands: TUE Eindhoven).
- Vidyarathi, S. (2015) *One Idea, Many Plans: An American City Design Concept in Independent India* (Abingdon: Routledge).
- Wadhawan, V. (2013). *Understanding Natural Phenomena*. Available at <https://vinodwadhawan.blogspot.in/2012/07/38-complex-adaptive-systems.html> (accessed 18 December 2014).
- Watson, V. (2009) Seeing from the South: Refocusing urban planning on the globe's central urban issues, *Urban Studies*, 46(11), pp. 2259–2275.
- Wolfram, S. (2002) *A New Kind of Science* (Champaign, IL: Wolfram Media).
- Yeboah, E. & Shaw, D. P. (2013). Customary land tenure practices in Ghana: Examining the relationship with land-use planning delivery. *International Development Planning Review*, 35(1), pp. 21–39. doi:10.3828/idpr.2013.3.
- Yin, R. (1994) *Case Study Research: Design and Methods* (London: Sage Publications).
- Zhang, S., de Roo, G. & van Dijk, T. (2015) Urban land changes as the interaction between self-organization and institutions, *Planning Practice & Research*, 30(2), pp. 160–178. doi:10.1080/02697459.2015.1014226.