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**URBAN SPRAWL PROCESSES AND METROPOLITAN POLICY,
THE CASE OF BARCELONA AND SEKONDI TAKORADI IN
GHANA**

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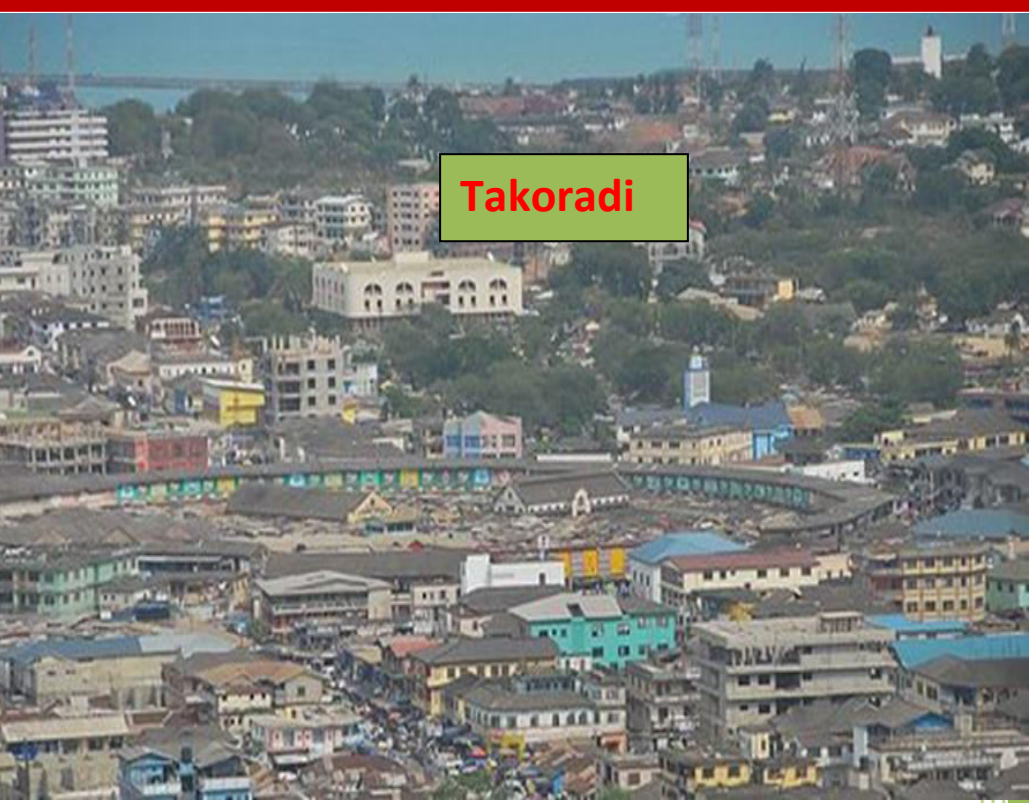
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***URBAN SPRAWL PROCESSES AND METROPOLITAN
POLICY, THE CASE OF BARCELONA AND SEKONDI
TAKORADI IN GHANA.***



Takoradi

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ABSTRACT

In an increasingly urbanized world there is a rising concern on the consumption of suburban lands, soil ceiling and rationally worsening climate change adaptation agenda culminating in unsustainable expansion of cities. Low density and discontinuous urban growth is a matter of great concern to city governments, urban planners, sociologists, economists and environmentalists. A number of factors relating to the economics of land in the city, demographic changes such as reduced average household size, rising incomes and higher auto ownership, weak planning and enforcement regimes, among others have propelled urban sprawl in the 21st century. From a technical view, sprawl is associated with several adverse consequences ranging from larger commuting times and greater consumption of fossil fuels to increase in pollution and high capital investment to accommodate populations growing into the suburbia.

The purpose of the study was to particularly identify and link the urban sprawl processes, its driving forces and management policies in the developed world to that of the global south (an area which available research has not been able to sufficiently probe). The research applied descriptive and explanatory methodologies to the metropolitan policies of Barcelona on sprawl and how these could be transferred and adapted to management of similar situations in Sekondi-Takoradi metropolis in Ghana. The phenomenon of urban sprawl was analyzed from its origins and driving factors, the different manifestations, the possible solutions of control and the role of existing metropolitan governance policies. The concentration was more on Barcelona case purposely to draw urban planning lessons for Ghana.

The study found that a relatively robust planning and enforcement regime on densification has managed sprawl to a tolerable degree in Barcelona than Takoradi. Also, the metropolis of Barcelona has changed substantially with the arrival of international immigration, the rapid transformations in family settings and the consequences of over-tourism which thus, influenced the gains made on metropolitan policy implementation. Unlike, Sekondi Takoradi metropolis which is growing extensively without many physical constraints, Barcelona is founded within a topographical constraint informing the morphology and compact city agenda. Also, the 1992 Olympics games have been identified as a major bolster in the spatial transformation of the city and other municipalities in the metropolitan area of Barcelona. It is observed however that no matter the differences in contexts, the consequences of urban sprawl are the same.

KEYWORDS:

Urban Sprawl; driving Forces ; Metropolitan Policy; Urbanization; Urban Governance; Peri-Urban; Densities; Comparative Analvsis : Barcelona. Takoradi.

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GLOSSARY

AMB	Area Metropolitana Barcelona
STMA	Sekondi Takoradi Metropolitan
ECA	Economic Commission for Africa
EEA	European Economic Area
EPA	Environmental Protection Agency
EU	European Union
EUA	Extended Urban Area
MMDA	Metropolitan Municipal District Assemblies
GIS	Geographic Information System
SAEMA	Shama Ahanta East Metropolitan Assembly
ESPON	European Spatial Planning Observation Network
L I	Legislative Instrument
GSS	Ghana Statistical Service
OECD	Organization For Economic Co-Operation and Development
NSDF	National Spatial Development Framework
WRSDF	Western Region Spatial Development Framework
MTA	Metropolitan Transport Authority
VMT	Vehicle Miles Travelled
CBD	Central Business District
STUN	Sekondi Takoradi Urban Network

APPENDIX

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CHAPTER ONE

1.1 Introduction

Urban Sprawl, a common characteristic of the increasingly urban world has been persistently consistent in leading the growth of an uncertain and unsustainable urban future. Peri-urban sprawl is commonly held as a dispersed urban expansion and an integral denominator of changes in urban patterns, settlement morphology and urban form. Sprawl and metropolitan policy are phenomena common to many cities but they do have particularities depending on the geographic, economic and societal context. Consequently, Metropolitan policy, an action driven agenda for managing urban growth is defined as a deliberate system of principles formulated by metropolitan authorities to guide decisions and propose solutions to metropolitan and urban challenges. This research will examine the driving forces behind urban sprawl and the influence of metropolitan policy in managing sprawl under the two contexts (Barcelona Metropolitan Area and Sekondi Takoradi Metropolis). These were specifically chosen because of commonalities that exist between them; such as Barcelona, a seaport, capital, second largest city in Spain, with a long history of urban planning and one of the fastest growing cities in southern Europe as against Takoradi, the capital of Western Region also a seaport, and the third fastest growing city in Ghana fuelled by oil boom).

1.2 Problem Definition

Urban sprawl is a necessary evil in contemporary urban development (Litman and Todd, 2015). Peri-urban sprawl has devastating consequences on land use and sustainable urban development while urban policies in most cases have been less effective at completely eliminating sprawl. Urban sprawl can be seen as the result of government structure/actions, an institutional policy predicament which requires the attention of grounded policy focus rather than the traditional land use approach as applied in most cities across the world. While most governments try to regulate the development of urban areas from the occurrence of sprawl, there are no easy solutions. However, the potential to curb urban sprawl have better been handled by policies such as 'new urbanism' and 'smart growth' in North America, 'compact city' and 'multifunctional land use' policies in Europe (Dieleman and Wegener, 2004).

While efforts are being made at Metropolitan and municipal levels with the application of Planning laws, programmes, tools and land use strategies to effectively control urban sprawl. Despite the big pool of available research in these areas, sprawl has proven to be irreversible and continue to occur in cities thus thwarting the efforts of local authorities to have a sustainable city,

improve air quality by taming emissions from car usage and at the same time protect the rural agricultural lands.

Previous efforts have proven to yield unintended consequences. For instance, in the Western world, most urban policies have instead propelled changes in urban forms leading to increased de-densification and sprawl. A case in point is the motorization of the city with the introduction of the railroad, tramways lines and buses which have made possible the expansion of the city during the first half of the twentieth century, thus increasing the taste to commute at low cost (Palacio, 2012).

Unsurprisingly, sprawl is more common in regions where incomes are high and commuting costs are low (Wu, 2006, cited in EEA, 2006.). As a policy, some metropolitan governments have concentrated on restricting urban sprawl by focusing on redevelopment rather than new developments (Nelson, Nd). It is however unclear if such redevelopments are enough to curtail the soaring taste of people to locate out of the city core which is increasingly becoming expensive due to proximity to wants.

The policy mix and the dilemma of exploring easy solutions to sprawl have yet lingered on for decades especially in the third world. There is therefore the need to investigate how successful some local governments (at metropolitan level) have applied effective policies to curb the situation of peri-urban sprawl in developed economies so as to simulate lessons for the developing world context.

1.3 Study Area Selection and Justification

Barcelona's city-building remains one of the best models in the world though Spain may be facing significant economic and political challenges these days (Toderian, 2012). The purpose for the choice of Barcelona for this study could be argued that the issue of manageable sprawl is due to the compact settlement nature in the entirety of Spain, including the morphology of housing and the city settlement structure. Moreover, Barcelona compared to Ghana has a longer history of urban planning which arguably informs a relatively stable sprawl in the periphery compared to the Sekondi Takoradi Metropolis.

In Ghana, most municipalities exude a weak planning enforcement regime. Unimplemented plans due to low compliance of planning regulations coupled with a disorganized housing industry; if there is any, have compounded any attempts to put the phenomenon of sprawl under control in the West African country. Moreover, Barcelona, being of a similar size and location as that of Takoradi metro has implemented successful smart city projects predominated by urban renewal

instead of urban expansion. These though, may be partly due to its natural restrictions by topography, Barcelona is seen to have been considerably managed compared to Sekondi Takoradi which could be lessons beneficial to the planning institutions for comparative analyses.

Fig 1.1 Study Area- Locational Maps



Source: <https://www.mapsofworld.com>

1.4 Research Questions

The main question was; how does effective metropolitan policy contribute to urban sprawl control under the two different geographical and morphological contexts? (Barcelona and Sekondi Takoradi). Specifically the derived sub questions were as follows;

1. What specific drivers influence sprawl in the two areas?
2. What are the available metropolitan policy initiatives on urban development existing in the Barcelona worth emulating for application in Takoradi?
3. How is urban sprawl being managed with the execution of these policies?

1.5 Objectives of the Study

The general Objective of this study is to examine the driving forces of urban sprawl in Barcelona and Takoradi in Ghana and the role of metropolitan policies in managing the phenomenon of urban sprawl in both contexts. However, the specific objectives are;

- 1) To make a comparative analysis of the major driving forces of sprawl in both areas and identify lessons from each context.
- 2) To assess the existing policies of the Barcelona compared to Sekondi Takoradi metropolitan areas.
- 3) To examine the role of metropolitan Policies in managing sprawl.

1.6 Hypothesis

Barcelona having a compact urban area and a higher population than Sekondi Takkoradi could appear as the logical answer to the research questions. However, other explanations could arise. The main hypothesis is that **Barcelona metropolitan policies have been more robust and effective in controlling sprawl**. Other possible explanations could be related to economic factors or cultural preferences, housing and topographical restrictions due to location.

1.7 Scope of the Study

Contextually, the study focuses on the urban sprawl process and metropolitan policies to manage sprawl; a comparative study of two cities, one in a developed world (Barcelona in Spain) and the other in developing country (Takoradi in Ghana). The study is therefore limited geographically to both metropolitan areas. This study area is selected because of its high rate of sprawl, a common location characteristics and population size. It is also because Barcelona is a shining example of a sustainable city, accordingly planned with spectacular lessons which are transferable to Takoradi in Ghana.

1.8 Relevance of the Study.

The study is informed by the increasing rate of urban sprawl with little or no effective solutions in the developing world. The study therefore will seek to find the impact of metropolitan policy in a developed Mediterranean city Barcelona and make policy recommendations to application of same in a developing city, Takoradi so as to eliminate if not reduce the growing canker of rapid urban sprawl. Thus, the study intends to convey lessons for sustainable urban land use management in the Sekondi Takoradi metropolitan area Ghana as a whole.

The study will also contribute to knowledge in the area of development controls and spatial planning and could be adopted and implemented by various land management institutions, municipal assemblies, city authorities as well as central governments so as to razing tendencies

of depleting green agricultural lands and promote compact cities thereby ensuring orderly and progressive development of human settlements.

It is important to note that the study had a relatively high focus on the Barcelona than that of Takoradi in Ghana because the research was premised on drawing lessons of the Barcelona case to help enhance urban planning practice in Ghana.

1.9 Research's Overarching Methodological Avenue.

According to Sarantakos (1998) a research design is the logical sequence in which the study is conducted. It is the design or structure before data collection and analysis can commence. A descriptive case study design has been adopted for this study. This has been adopted in order to thoroughly investigate the influence of metropolitan policy of Barcelona on sprawl and the causes, forms of sprawl management that could be transferred to the case of Takoradi.

As has been stated earlier the main aim of this study is to provide a basis for further research, grounded on sound theoretical review of descriptive and explanatory work which may be used by local governments interested in international comparisons on metropolitan policy under the wake of current happenings in an increasingly urbanized world.

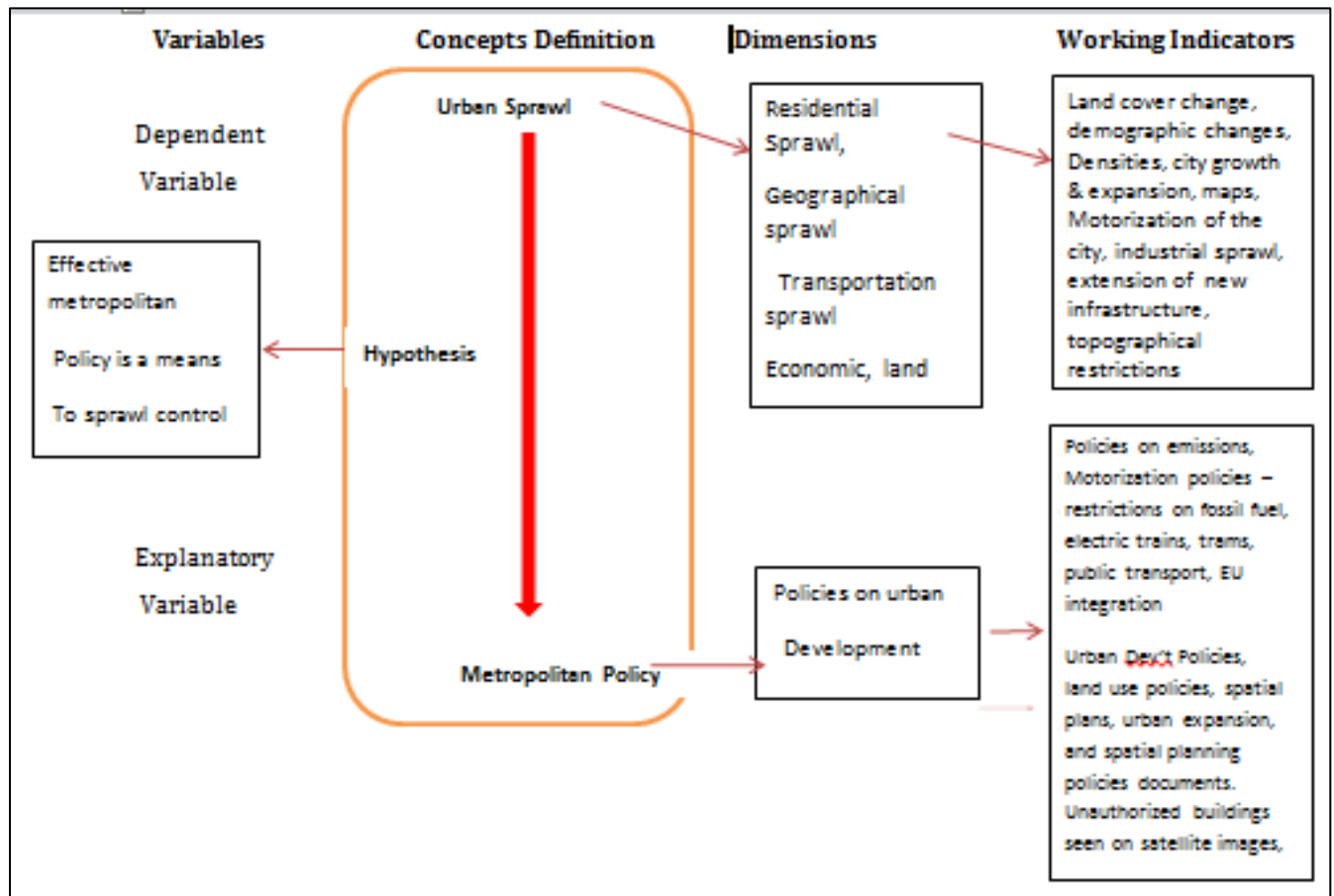
Arguably the work rests on descriptive, analytical and experimental approaches mobilizing both quantitative and qualitative data. As a result, the study began contextualizing recent concepts and definitions related to sprawl, urban governance and metropolitan policy. Urban policies from a perspective view of their past and current dynamic and legal regimes, the driving forces behind sprawl, tested urban containment strategies in use in both the Western and southern spheres have all been examined with their descriptive analytical underpinnings.

This analytical avenue is mainly developed in the fourth chapter of the report which has been devoted mainly to the explanation of the results and the discussion, trying to show the implications of secondary sourced data, juxtaposed on primaries sources field interviews. The idea was to analyze, assess and examine strengths and weakness, panning approaches and outcomes of the urban policy regimes in both Barcelona and Takoradi Ghana so as to draw conclusions on the main reasons to explain the facts in the study case.

Finally, the exploratory outcomes of the work are compiled and presented in the final chapter which draws conclusions on the study of the two. Though the experimental challenge were argued from the parameters for assessing the effectiveness or otherwise of urban metropolitan policies, a significant step on examining data and results in various plans, programmes and projects to depict the extent of urban expansion and the role of driving factors were applied to

resolve the theoretical impasse. The dynamic nature of the topic under investigation dwells more on the happenings in Barcelona than that of Sekondi Takoradi metropolis. This was intentionally done so as to draw lessons to enhance planning practice in Ghana.

Fig 1.2 Analytical model for the Study



Source; Author, 2008

The main underpinning focus of the research is the two variables; metropolitan policy and sprawl. As shown in fig 1.2, the analytical model outlines the procedures that cover the entire study to generate meaningful decisions. The idea is to structure what summarizes the main areas of focus and the specific indicators of measuring the variables to arrive at the hypothesis. The model might not represent a perfect example of the study in terms of the mode of data capture and feedback of policy; it however represents an indication of the descriptive approach and consequential explanations to the outcomes of the study.

1.3 Conceptual Framework

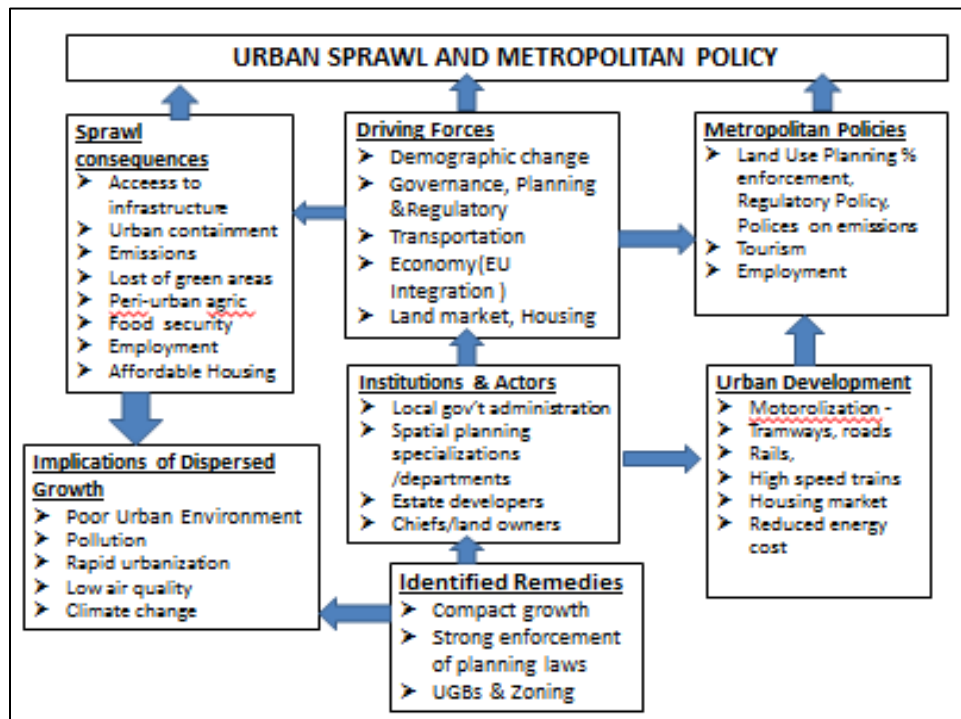


Fig1.3 Conceptual Framework on Urban Sprawl and Metropolitan Policy

Source; Author's Construct, May 2018

As summarized in figure 1.3, a Conceptual Framework of the study and supported by relevant research findings, the phenomenon of sprawl is driven by several factors which ultimately operate in a heterogeneous mix under the domain of metropolitan governance and policy. According to the study by Palacio (2012), motorization of the city is the main driver influencing urban sprawl. This means sprawl, $S = MoEXP(rt)$, where M is motorization and rt is the rate of investment in motorized projects eg. tramways, roads, rails etc. Motorization therefore represents the kind of metropolitan policy on transportation. While Wu (2016) believes that the low cost of commuting is the strongest factor and thus sprawl is higher when the cost of commuting in a certain region is lower. Thus, an inverse relationship between commuting cost which is influenced by cheap energy for auto use and rate of sprawl in developing cities.

However, Cobbinah & Amoako (2014) in their work found that sprawl is the result of ineffective local governance to control unauthorized growth. It therefore means that a model used by them; has metropolitan governance systems as a key factor including land use planning and enforcement control. Redevelopment is a means to control sprawl. As a result, redevelopment is being held as the explanatory variable as in the case of Nelson (Nd) in the Barcelona example.

In this research, the approaches of Cobbinah & Amoako and Palacio scenarios respectively were specifically adopted. The study would also be exploring the efficacies of metropolitan policy in urban sprawl control using similar mathematical models as aforementioned.

These two theoretical models were chosen because of the validity of the outcomes and the applicability of the findings in further research. The diverse nature of sprawl and its causes has possibly informed the variegated nature of urban policy responses.

1.10 Limitations of the Study

While time was a major constraint in the lead up to the thesis, a number of ad hoc measures were employed to manage it. However, there were some specific data and documents relating to urban expansion and spatial development in the two areas such as the number of building permits, the number and type of newly built houses, homeownership rates and the territorial distribution of household incomes which were not readily available. Also, some interview schedules were shifted while other interviewees were responsive. Upon the above mentioned challenges and limitations, it is important to note that most outcomes of this study were based on adequate reviews of documents, data, and previous research works to arrive at the full conclusions of the report.

REVIEW OF RELEVANT LITERATURE

2.1 Introduction

In an era of the world population's unprecedented urbanization, the issues of climate change and sustainability of the built environment are increasingly linked to the spatial organization of cities and regions. One particular characterization of spatial form under this context is urban sprawl which is considered as a threat to the urbanizing world, with environmental consequences from land to water and air (Banai & DePriest, 2014).

The aim of this chapter is to assemble concepts, definitions of sprawl and the major metropolitan policy interventions required to mitigate the phenomenon. The chapter also attempts to explore associated literature as well as previous researches on urban sprawl and metropolitan policy. Particularities in this regard are the use of various urban strategies from the point of land economics and taxation applied in urban growth management or urban containment in the western world (US and Western Europe). Sub sections of the work have been preceded with concluding remarks at the end of each session so as to bring the passages to bear on the situations in the study area.

2.2 What is a Metropolitan Area?

The term is better understood by first getting to comprehend the meaning of 'urban'. The OECD(2011,) defined urban as "functional economic units", rather than a previous definition linked to "administrative " and went further to qualify metropolitan areas using the population indicator. The OECD (2013, p.4) state;

"Metropolitan areas are urban economic units with a population between 500000 and 1.5 million and while 'large' metropolitan, a population of 1.5 million or more"

Using the term "Urbanised area" the OECD (2011) further described it as artificial land with built-up area cover or urban use. It includes, for example, residential structures and non-residential buildings, retail ways and major roads as well as open urban areas like parks and sport facilities.

A similar definition by Banai and Weneger (2014) using a U.S. census definition of a metropolitan area, described it as having population of 50,000 or more. Imbedded in the US definition is the use of both geographic and demographic data.

Again, the UN-Habitat (2013) observed that across Europe, and particularly Western Europe (France, Spain, Italy) has witnessed processes of metropolization in the past years. This refers not only to a concentration of people and business activities in metropolitan regions but also to the rise of metropolitan region policies favouring a small number of international and competitive city regions. The definition utilizes metropolization and metropolitan policy as basis for international projection of an urbanized area.

Knieling (2014) observes that the 'metropolitan region' is not a clearly defined concept in the international stage, however, the term 'metropolitan region' is used to describe highly urbanized, city – regional areas that are characterized by a high population density as well as concentration of economic, political and cultural activities. This definition offers a multifaceted characterization of a metropolitan region in addition to population density.

Also, the term 'metropolis' has been elucidated by Knieling (2014) stating that a city can be said to be a metropolis when it performs an important commercial, cultural and political function for its region or even the whole country.

Apart from countries such as the United States or Canada, in Spain and Ghana there is no systematic statistical definition for what metropolitan areas are. Particularly due to the fact that the National Institute of Statistics does not have a metropolitan data classification category; while most of the regional statistical institutes are not able to provide such specifically categorised data (Tomas, 2015).

All available evidence demonstrates conclusively that urban sprawl has accompanied the growth and development of urban areas across Europe over the past half century especially in metropolitan regions (EEA , 2006). The areas with the most visible impacts of urban sprawl are found in countries or regions with corresponding high population density as well as economic activity in Netherlands, southern and western Germany, northern Italy, the Paris Region and Spain (EEA , 2006).

As metropolitan areas expand demographically and economically, the interplay of urban problems may fuel urban sprawl. Among these are Speculation, government policies, development and property tax system, lack of affordable housing, demand of more living space, public regulation, transportation, failure to enforce planning policies and country-living desire. These among other factors exist to drive sprawl which is to a large extent affected by the available metropolitan policy in the setting.

2.3 What is Urban/ Metropolitan Policy?

To understand these closely related terms seen as intrinsically imbedded in the comprehension of urban governance, it is apt to offer a definition of urban governance. Urban governance is often referred to as governance process consisting of citizens, local associations, interest groups and private actors, who collaborate to achieve a common purpose, such as the provision of public services or projects aimed at boosting development. The main actors in an urban governance processes can also consist of institutions and actors drawn from within but also beyond government, and obscure boundaries with tasks for handling social and economic issues [Stoker,1998, Arthur, 2007]. In a further concrete view, Tomas (2015) defines metropolitan government as the maximum institutionalization level of metropolitan areas; that is, the creation of metropolitan institutions with strong competencies (legal and tax autonomy) and democratic legitimacy (direct election of their representatives).

It has been difficult to come by a precise definition of urban policy since most literature have been concerned with evolution of urban governance and the role of the local government actors in urban management. However, Blackman (1995, 2003) sees urban policy as essentially about the welfare of local residents in an urban society. This according to him involves planning and delivering public services and supporting the development of the local economy.

In Barcelona, the General Metropolitan Plan of urban planning was for the first time approved by the Provincial Commission of Urban Planning in Barcelona on 14 July 1976, which aims at the urban planning of the territory that integrated the previous Barcelona Metropolitan Municipal Entity, which included a total 27 municipalities. Subsequently, in 2010 a Law passed by the Catalan Parliament created the metropolitan area of Barcelona with 36 municipalities.

In Ghana however, the first urban policy was launched in 2013. It has since not drawn attention because the institutional and legal frameworks for implementation have since not been established. Meanwhile, prior to the 2013 launch, the urban planning function in Ghana discharged by the Town and Country Planning department relied on an outdated Town and Country Planning Ordinance known as Cap 84 of 1945. This law was later replaced in 2016 by the Land Use and Spatial Planning Act, 925, 2016, establishing and consolidating the *laws* on land use

and spatial planning and also providing for sustainable development of land and human settlements through a decentralised planning system.

2.4 Metropolitan/Urban Governance

The scenario of the new metropolitan project is the outcome of the passing of Law 31/2010 dated 3rd August by the Parliament of Catalonia on the creation of the Barcelona Metropolitan Area (AMB), (see table 2.1). The roles and responsibilities in transport and environmental matters, previously assigned to the restructured entities, are complemented in the new Law by a group of competencies on urban planning, economic development, social harmony and social cohesion matters. The urban planning competency has been refocused on directing a strategic metropolitan vision of the Barcelona area (Avendaño, 2015).

Table 2.1 Examples of Metropolitan Governments in Europe

Name and date of Creation by law	Number of Municipalities	Type of Election	Principal type of Financing	Main Competencies
Metropolitan Area of Barcelona, 2010	36	Indirect: council of 89 members (delegates from municipalities)	Transfers (above all from municipalities and consortia), taxes	Territory and urbanism; transport and mobility; housing; environment; economic development; social cohesion
Verband Region Stuttgart, 1994	179	Direct: assembly, between 80 & 96 members (now 87) elected every 5 year	Transfers (municipal, county, länder and federal government) and transport taxes	Transport, territorial planning, economic development, waste treatment, tourism
Greater London Authority, 1999	City + 32 districts (boroughs	Direct: mayor & assembly (25 councillors elected every 4 years)	Transfers (above all central government)	Transport; Economic development, international promotion; prevention and fire control, emergencies, police and security
la Métropole de Lyon 2015	59 municipalities	Indirect: council of 165 members	Fees and own Taxes (TPU) and central	Economic, social and cultural; development, territorial planning,

(delegates from municipalities)	government transfer	promotion of public housing urban dynamization and revitalization; management of shared services; environment
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Source; Tomas 2015, 2007

In Ghana, the local governance structure is operated with a three level hierarchy of metropolitan, municipal and district assemblies. A metropolitan area like other countries is decided on the basis of the population threshold of 500,000 and above. As a country of 6 metropolitan areas, 55 municipal and 212 district assemblies, the idea of metropolitan regions is alien to Ghana and thus is rarely used. The Takoradi Metropolitan Assembly was created after it was renamed from the old Shama Ahanta East Metropolitan Assembly (SAEMA) in 2008 through a Legislative Instrument (LI) 1316. As indicated in the below table (Table 2.2), various local governments in Ghana have competences (departments) according to their grade.

Table 2.2. The Local Governance System in Ghana.

Metropolitan Assembly	Municipal Assembly	District Assembly
1. Central Administration	1. Central Administration	1. Central Administration
2. Finance Department	2. Finance Department	2. Finance Department
3. Education, Youth and Sports Department	3. Education, Youth and Sports Department	3. Education, Youth and Sports Department
4. Metropolitan Health Department	4. Municipal Health Department	4. District Health Department
5. Agriculture Department	5. Agriculture Department	5. Agriculture Department
6. Physical Planning Department	6. Physical Planning Department	6. Physical Planning Department
7. Social Welfare and Community Development Department	7. Social Protection and Community Development Department	7. Social Welfare and Community Development Department
8. Works Department	8. Works Department	8. Works Department
9. Trade and Industry Department	9. Trade and Industry Department	9. Trade and Industry Department

10. Natural Resources Conservation, Forestry and Game and Wildlife Department	10. Natural Resources Forestry Conservation and Game and Wildlife Department	10. Natural Resources, Forestry Conservation, and Game and Wildlife Department
11. Disaster Prevention Department	11. Disaster Prevention Department	11. Disaster Prevention Department
12. Roads Department	12. Roads Department	-
13. Transport Department	13. Transport Department	
Waste Management - Department	-	-
Budget and Rating - - Department	-	-

Source; Ghana Local Governance Act 936, 2016

2.5 Defining Urban Sprawl

“Sprawl means different things to different people” Calthorpe and Fulton (2001, 2) note. While some view sprawl as a set of unintended consequences of a lifestyle in the suburban place and auto commute to work, others consider it a waste of essential resources—land, water, air, and energy—and, above all else, inimical to civic life if not the economy and society (Kunstler 1993, Duany et al. 2000, Banai and Depriest, 2014).

Urban Sprawl has a long history emerging from industrial revolution and the product of steady economic growth in the Western World, leading to increased car ownerships. For instance, Gonzalez (2017 p. 32) states;

“Urban sprawl began in the 50s in the United States during the car boom. Its ideologist were expounded by the architect and urban planner Ludwig Hilberseimer, who, like Le Corbusier, proposed separate housing uses (garden city) and offices. A great defender of this model was Frank Lloyd Wright. At that time the car was a symbol of freedom, courtesy of the American dream, and the oil crisis and the harmful effects of CO2 emissions in the atmosphere were unknown”

The multifaceted nature of sprawl brings to the fore several definitions from a diverse set of fields. These definitions of the phenomenon have been recounted below;

According to (Banai and Depriest, 2014, Hayden , 2004, 8) Urban sprawl is a process of large-scale real estate development resulting in low-density, dispersed, discontinuous car-dependent construction, usually on the periphery of cities mostly declining older suburbs and shrinking city centers.

While Bourne (2001, 26) recounts sprawl occurrence, such as any extension of the suburban margins, the spread of development onto sensitive green areas and agricultural soils, increases in highway congestion, the proliferation of new subdivisions of homogeneous and low density, single-family housing, others see it as suburban development that is haphazard, disorganized, poorly serviced, and largely unplanned (Banai & Depriest, 2014).

From another perspective, a definition emphasizing on the continuous devastations of land as an economic resource by sprawl, the EU (2011) viewed sprawl as a specific form of land take, resulting from the spread of low-density settlements. As a consequence for metropolitan policy, urban sprawl concerns cities' attractiveness, their resource efficiency, their transport infrastructure and the location of public and private services.

Dieleman and Wegener (2004) define urban sprawl as the growth of urban spatial patterns with low densities, large outward expansion, spatially segregated land uses, leapfrog urban development, and widespread commercial strip development. That implies sprawl defeats the resolve for sustainable urban land use, and encourages wastage.

It is a commonly held view that urban sprawl is the result of unplanned, uncontrolled development in the peri-urban district. "Peri-urban" is broadly defined by Da Gama (2011) as unregulated low-income districts far from a city's center. Consequently peri-urban irregular sprawl often translates into poor housing conditions, urban violence, lack of infrastructure, and a diversity of environmental hazards, including deforestation, poor sanitation, pollution of rivers and streams, and loss of biodiversity.

From the aforementioned, it can be observed that most definitions have found sprawl as a continuous physical expansion of the urban area presenting unpleasant conditions for sustainability. Overall, urban sprawl can be referred to the low-density and uncontrolled expansion of urban areas into suburbia.

Why urban sprawl is an increasingly important phenomenon in the urban planning thought is that, it is very difficult to control, often described “irreversible” as the land being consumed by sprawl often lies outside the cities’ administrative areas. Weak planning regulations or its enforcement are prevalent in many countries, leaving room for profit targeting private interest and lobbyists to steer developments with short-term profit logic (Cobinnah & Amoako, 2014).

Urban sprawl in general has diverse ramification as an urban phenomenon especially in rapidly urbanizing regions. Apart from its difficulty to cap due to the requirement of huge logistical and political commitments, the causes are varied and context dependent. To under understand the phenomenon better, researchers have identified the indicators of sprawl and the dimensions for measuring it.

2.6 Indicators of Sprawl

Sprawl is said to be a contentious urban term, viewed conceptualized from various perspectives. The contentions and definitions suggest sprawl indicators among which are surrounded on density of population and dwelling unit (dwelling units per acre). Additionally, attention should be given to commercial, residential, and industrial uses, since, as Banai And Depriest (2014, Bourne, 2001) emphasize lower-density commercial and industrial uses contribute to sprawl more than higher-density residential uses, notwithstanding a larger share of urban land use being residential.

Similarly, the commonly used indicators according to Handy et al, (2002) are density, rate of urbanization, population growth relative to vehicle ownership growth, or increase in Vehicle Miles Traveled (VMT). These concepts are better appreciated by recounting the key dimensions for measuring sprawl.

2.7 Measuring Sprawl

Different ways of measuring sprawl may yield widely different results. As a result, Galster et al. (2000) enumerate eight measurable dimensions commonly applied to assess the extent of sprawl. These are: compactness, density, concentration, centrality, continuity, diversity, and proximity and nuclearity. The dimensions are measured by using a combination of GIS and field survey and by grids thus dividing “urban areas” into one-mile. These eight conceptually distinct dimensions to characterize sprawl are further elaborated in table 2.3 below.

Table 2.3 Dimensions for Measuring Sprawl

DIMENSION	DEFINITION	MEASURE
Density	average number of residential units per square mile of developable land	Planning and managing cities. monitoring & evaluating urban plans, Sustainability targets, intensity of land-use.
Continuity	degree to which developable land has been developed in a continuous and unbroken fashion	extent of leapfrog development
Concentration	degree to which development is located in a small fraction of the total urban area	location housing units & employment at specific densities, extent of evenly distributed activities
Compactness or clustering.	degree to which development has been bundled to minimize the amount of land in each square mile land	extent to which all land uses within a particular area are dispersed or crowded
Centrality	degree to which development is located close to the central business district (CBD) of an urbanized area.	Sprawl ,Distances from CBD The
Diversity.	the degree to which two different land uses exist within the same small area	travel time and distance of the residents in the area. traffic congestion, trip length.
Proximity	degree to which different land uses are close to each other across an urbanized area..	average distance people must travel from any origin to every other destination.
Nuclearity	the extent to which an urban area is characterized by a mononuclear (as contrasted with a polynuclear) pattern of development	Number of nuclei; one nucleus or many nuclei, related to concentration.

Source; Galster et al, 2000, Handy et al 2002, Brian, 2007

From the table 2.3, some of the stated measures have long been concepts applied in design of most cities. For instance, a number of such dimensions are observed to have been infused in the

architecture and planning of Barcelona. Specifically, centrality and proximity have been conspicuously employed in the morphology of wide avenues and boulevards of Cerda's Plan in Barcelona showcasing ample room for multi-modal infrastructure. As stated by Toderian (2012, p 3) in his description of these boulevards and their walking friendliness due to proximity of land use;

“Barcelona is one of those cities where you have many choices in how to get around, and the urban form facilitates those choices. Because of the densities and mix-of-use, walking, biking and transit are always viable options. The “power of nearness” with everything compact and close, facilitates a multi-modal city all other forms of traffic.”

2.8 SMART GROWTH AND NEW URBANISM

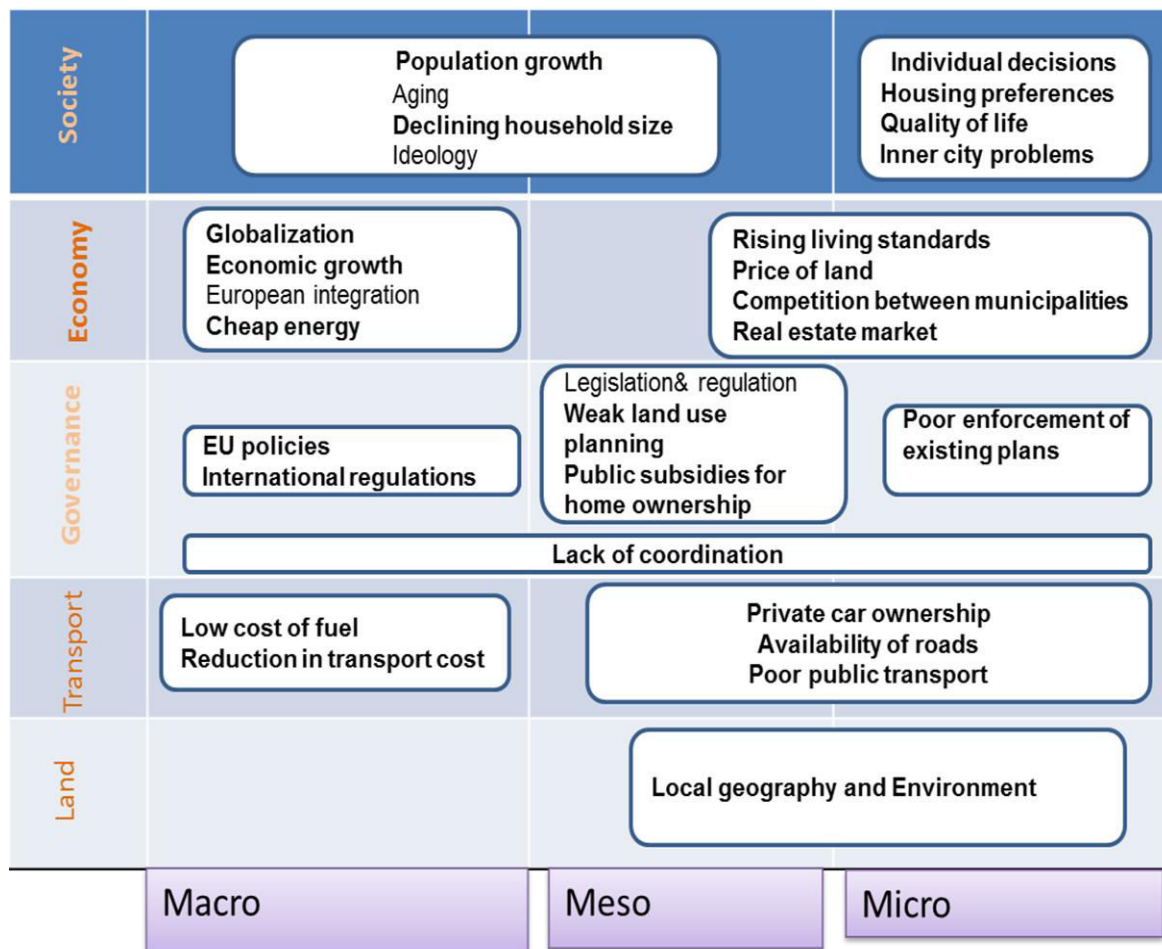
The evolution of urban policy from the medieval period to the twentieth century has come along with different concepts to manage or contain urban growth. The most current approach to this transition emerged in parts of Europe and the United States and is called “new urbanism” or “smart growth” (UN-Habitat 2013). Smart cities by definition are cities where information technologies help reduce the impact on the environment, being more economically viable, and improving the quality of life of their inhabitants” (Sultana and Weber, 2014, Gonzalez, 2017). It is aimed at promoting urban forms that are more sympathetic to the natural environment and consequently promote the sense of place and identity accompanied by a stronger resilience - a reaction to lightly regulated suburban sprawl, commercial and monotonous housing estates, property developments, and the traditional separation of different land uses. New urbanism promotes more compact, higher density, mixed-use developments that bring home, work, shopping and entertainment into proximity, under the umbrella phrase of “sustainable urbanization” (UN Habitat, 2014)

2.9 FACTORS DRIVING URBAN SPRAWL IN METROPOLITAN CONTEXT

Urban Sprawl is affected by many factors and it may be difficult to determine what factor has the greatest influence. Furthermore, driving forces behind urban sprawl vary between cities, regions and countries. Therefore, driving forces and potential for urban sprawl is dependent on the political, social and economic conditions in each city (Christiansen and Loftsgarden , 2011).

Figure 2.1

FACTORS DRIVING SPRAWL



Source: *adapted from*; (ESPON (2010:22), Christiansen and Loftsgarden, 2011).

a) Demographic Changes

Population growth has been presented as a primary cause of urban sprawl in Europe in recent decades (ESPON FOCI 2009, Glaeser et al. 2001, Glaeser 2005). The causes of population growth and influx to the cities are related to economic growth as a result of industrialization and technological progress. Increasing populations in the cities due to urbanization provides pressure on the housing market and more expensive homes. In addition, an increasing population could lead to urban problems, such as traffic, congestion, air pollution, noise and crime. These factors will cause the population to either be forced (due to high housing costs), or choose to move out of cities. Some of the significant demographic changes according to Handy et al (2002) that have contributed to sprawl include population growth, reduced average household size, increased average household income, and higher auto ownership.

b) Investment Policies

Some earlier arguments have been carved along the increasing investment in transportation infrastructure in the city as a major cause of sprawl. For instance, Nelson and Duncan (1995) recounted that the construction of interstate highways and federal transportation investment policies encouraging construction of new roads over maintenance of existing roads or development of various alternative transport modes such as metro rails, tramways have contributed to sprawl.

This argument is justifiable, for instance in Takoradi Ahanta West areas of Ghana, the construction of a highway linking Agona to Takoradi city in the early 2000s led to the opening up of massive developments along this corridor. However, it was not pronounced until the recent discovery of oil in 2011 region that propelled uncontrolled scramble for land leading to extensive haphazard developments in these area.

c) Development Policies and Regulations

Direct interference of government in housing market thereby causing selective cushioning of the business atmosphere in the suburbanites may lead to sprawl. This argument has been expounded by FSCC, (1998), Handy et al, 2002 p.3);

" Subsidies and regulatory incentives for businesses to relocate from cities and suburbs to previously undeveloped areas contribute to sprawl. Businesses tend to relocate to take advantage of tax incentives and avoid higher land and capital costs in downtown areas"

In addition, when the mortgage insurance system favors single-family dwellings, there is a high possibility to encourage low-density suburban development.

d) Speculation

Similar to the aforementioned, speculations as a driving force in land economics has an immense influence on which lands are developable in anticipation of higher returns. This according to Nelson and Duncan (1995) has amounted to a certain degree of sprawl influenced especially by the activities of real estate market. This is basically due to the fact that Tax policies, preferential assessment policies such as greenbelt taxation and undervaluation of land for property tax assessment purposes stimulates speculation, resulting in more land being withheld from development than is efficient.

This is a common phenomenon in most cities of the global south. For instance, in Ghana, huge tracks of land are purchased by individuals and companies who hoard these lands awaiting further increases in prices in order to lease them out. These have driven other developers to the hinterlands thereby further exacerbating urban sprawl.

e) Land Use Regulation

The preferential enforcement of zoning regulations as a matter of land use policy in urban areas is sometimes detrimental to the development of lands in the urban core and has the tendency of pushing developers to the fringes. As stated by Snyder and Bird (1998), Handy et al (2002, p.3);

“Zoning regulations contribute to sprawl by limiting population densities and separating land uses. Land use controls that are more restrictive inside urban areas than outside can make rural areas more attractive for developers”.

This is a common trend in developing countries like Ghana where municipal land use control is more evident in urban areas with the common inscriptions “*Stop Work*” than in the rural enclaves.

f) Development Economics of Land

Competition of land use in the urban core leaves no room for affordable land prices. The result of the high rent as well as housing cost in the CBD area expels development to the urban fringes propelled by green eco-friendly environment and air quality. As a result, Handy et al (2002) viewed that more savings are associated with lower land construction, and parking costs for developments in areas outside the urban core. It therefore makes economic sense for profit targeting developers to be attracted to the outskirts. The trend has to a greater extent influenced sprawl especially in areas where planning control is weak.

g) Lifestyle Trends

Significant trends in lifestyles and attitudes in recent decades have also contributed to sprawl. These trends as stated by Bhatta (2010), Handy et al (2002) include but not limited to:

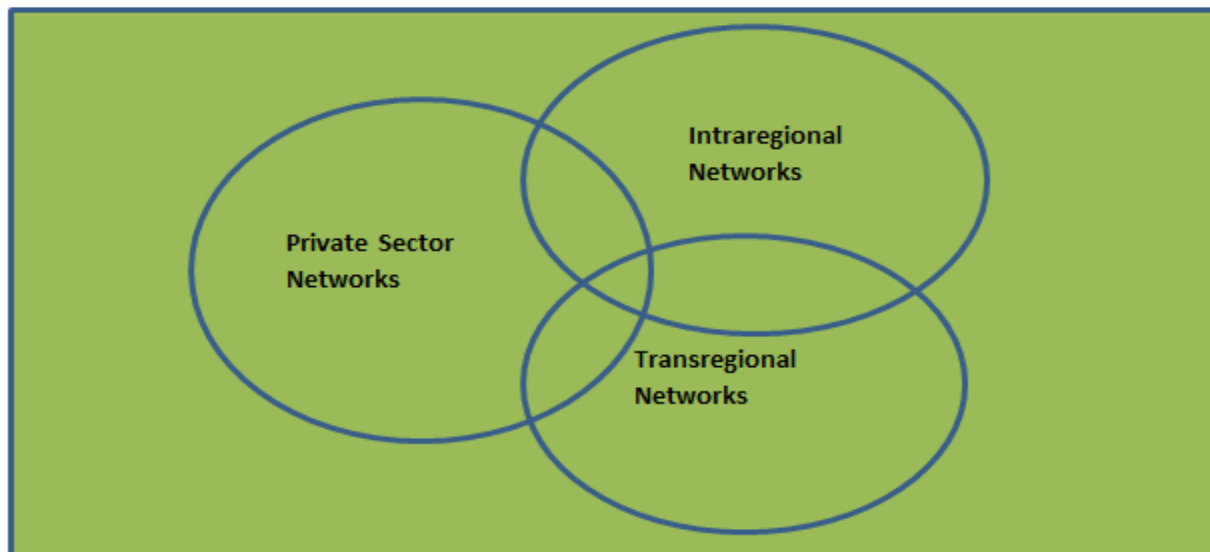
- The desire for new housing and commercial space at affordable prices
- The desire for a larger house and the resulting growth in the average size of new houses
- The adoption of policies aimed at increasing levels of home ownership

- Perceptions of higher crime levels and lower school quality in urban areas compared to suburban areas
- The desire to live in smaller jurisdictions in the hope of ensuring better services and more responsive government
- The desire to live in a homogeneous community historically expressed in racial and ethnic terms but increasingly expressed in terms of income and class.

2.10 MITIGATING SPRAWL USING URBAN METROPOLITAN GOVERNANCE/ POLICIES

A number of emerging dimensions of metropolitan action are undertaken to manage sprawl under the new era of public private managements. As far as metropolitan strategies are concerned it is not so crucial to be carried forward by strongly equipped metropolitan authorities as to be endorsed by alliances that interconnect the three different domains of action in metropolitan spaces. The below diagram represents the three main dimensions under which metropolitan urban strategies are carried out.

Figure 2.2 The Three Domains of Action in Metropolitan Strategies



Source; Salet, 2007

Below are some of the growth management policies that have the tendency of quelling the spate of sprawl in urban areas. In other words, these strategies are known as urban containment policies (Christiansen and Loftsgarden, 2011, Zacharoula, 2013). They are mostly extracts from US based case studies and approaches which in my view could be applicable to local conditions in

Ghana and while some are already in use in Barcelona. It is because the measures have proven to be valid in their application over the years under private sector dominated democracies. The idea behind the success of such policies is the existence of strong local governance and political leadership with a working tax regime.

k) Agricultural and Forest Programs

According to Al Tarawneh (2014) the causes of informal sprawl on agricultural land are ; shortage and un-affordability of housing stock, high price of agricultural land, weakness and inappropriate control tools, pressure from public infrastructure on agricultural land, and lack of coordinating mechanism to guide development.

The agricultural and forest programs policy has proven to be successful in this regard. The strategy reemphasizes the essence of agricultural lands use and aims at making agricultural reserved lands unavailable for urban development. In most cases it is able to quell development into the urban core. As stated by Handy et al (2002, p. 79);

“Agricultural zoning, including forestry zoning, is the most common method of resource land preservation used by local governments. Such zoning restricts land uses to farming and livestock, other kinds of open space activity, and limited home building. The most important element of agricultural zoning is the extent to which it restricts the intrusion of new, nonfarm uses into established agricultural areas”

However, such strategies are difficult to implement in Ghana due to the fact that access to land is mostly determined by market forces with less government interference. Ownership of land is in the hands of chiefs and families who lease out for specified number of years.

l) Brownfield Redevelopment

Baing (2010) observes that limiting Greenfield developments in containing urban sprawl has become an important aim of land use planning policy in recent years. The use of traditional planning instruments such as greenbelt designations and restrictive development controls is paramount. The systematic reuse of brownfield land has become an important urban policy objective, in attempts to ease the pressure to develop on greenfield land.

Similarly, Handy et al (2002) categorizes brownfields as abandoned or idled underused industrial, and or commercial facilities where expansion or redevelopment is complicated by perceived or real environmental consequences.

It is widely held that brownfields represent a great extent of developable space within the city. These areas could sustain a certain extent of urban developments and at the same time cater for the environmental sensibilities associated with these sites.

In Barcelona, a brown field redevelopment project such as those in a high technology zone [Diagonal Mar], the Universal Forum of Cultures 2004, a new container port and logistics were constructed on coastal brownfield and reclaimed land. This project involved the transformation of industrial land (200 hectares) and brownfields into an area of the highest urban and environmental quality, creating 3,200,000 m² for new business, 4,000 for social housing, and 114,000 m² for new green spaces, with 145,000 m² new facilities, and 180 million investment in infrastructure in the center of Barcelona (Menchawy, 2008).

m) Cluster Development

In newly developed areas, clustering development into concentrated areas can protect natural habitat. Cluster developments involve the building of gross densities comparable with conventional developments but leaving more open space by reducing lot sizes. Square footage of buildings and residential and commercial capacity may remain the same, but compact clusters reduce the dimensions and geometry of individual lots and shorten road lengths. One of the main advantages of cluster development as a conversion tool is that it does not take development potential away from developers, because it changes the arrangement but not the number of units permitted on a property (Handy et al, 2002). Cluster development as an urban design tool has been applied in building of most cities across Europe during the mid 20th century of which the Catalanian region is no exception.

n) Smart Growth and Compact Development

According to Al Tarawneh (2014) the concept of Smart Growth concentrates growth in compact walkable urban centers to avoid sprawl which is the inefficient use and conservation of land and other resources. It minimizes wasted space and money, encourages diversity, and preserves natural spaces. Smart Growth concept is a commonly held urbanism gaining roots in urban transportation planning process. Compact metropolitan development generally means that the space needs of a population can be satisfied with less land area. Compact development appears various forms among which most communities can develop more compactly by using three techniques: infill development, brownfields redevelopment, and cluster development.

Though the Barcelona metropolitan area is a huge urban enclave, the city of Barcelona has seemingly integrated walking into urban life, owing to the compactness of development especially in the city core.

o) Comprehensive Plans

Comprehensive plans include a community vision, information and projections (an inventory of what currently exists and what growth in population and land use is expected), land classification and zoning, economic development, residential areas, and facilities and infrastructure. Comprehensive plans help local officials understand the capacity of current infrastructure, anticipate the location of future facilities, and determine the appropriate timing for infrastructure repair and extension. However, many comprehensive plans are outdated and sometimes never implemented at all. It is therefore difficult if not impossible for these plans to respond to growth pressures, and carry out the community vision.

In Ghana and in many developing countries, there exist lack of effective local governance and planning control. As Asserted by Cobbinah and Amoako (2014) lack of effective local governance and weak operational systems and processes in local authorities have resulted in unplanned and uncoordinated urban outgrowths in most developing countries.

p) Infill Development

Sprawl is seen as the undesirable land use patterns- whether scattered development, strip or ribbon development and leapfrog development (Ewing, 2008). Infill development occurs in locations where some development has already taken place and infrastructure is already in place. In urban areas, infill development is typically executed by converting old buildings and facilities into new uses (redevelopment) or by filling undeveloped space within these areas, with environmental review exemptions sometimes acting as incentives. Efficiently facilitated infill and redevelopment is needed to ensure that urban areas remain vital, to respond to changing needs when and where needed, and to help dampen urban sprawl pressures (Nelson and Duncan, 1995). Urban Planners in Ghana with the power of rezoning or change of use usually undertake infilling upon request by the land owners which is normally accompanied by a justification report.

q) Land Acquisition and Banking

Acquisition of land is the most certain means of preserving the land's environmental and open space attributes. Land banking is involves an improved property or purchasing land and holding it for future use. This land is normally used to provide land for government services, redevelop

previously developed lands, improve local land markets, and recapture land values created by government activities. The most direct and often-used means of acquisition is outright purchase of fee-simple ownership by governments or by nonprofit groups that will hold it in trust for conservation purposes (Handy et al, 2002)

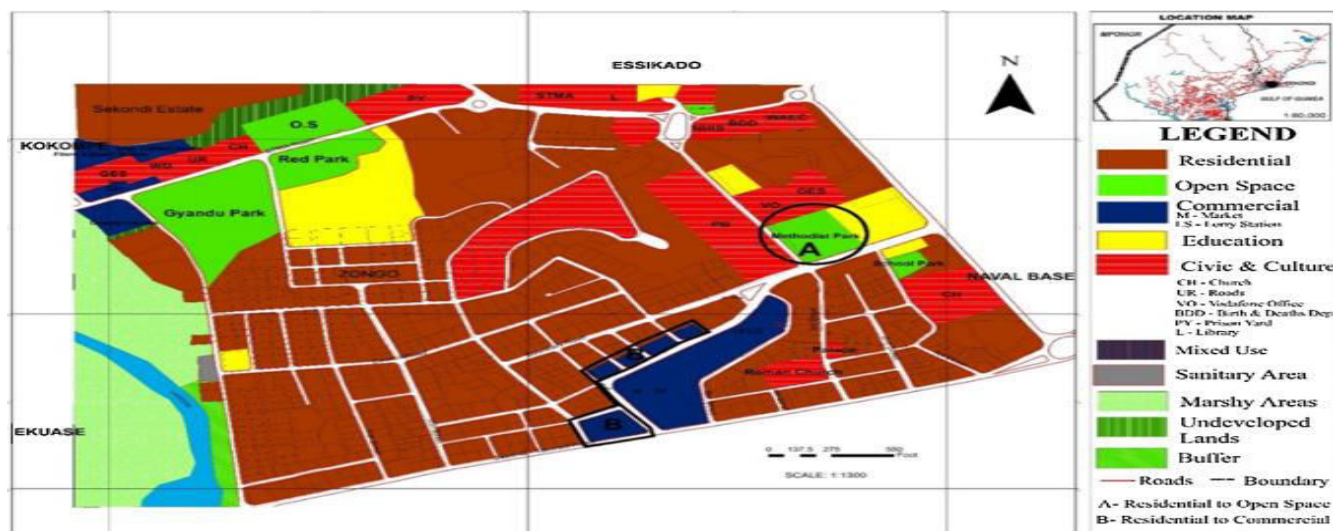
In Ghana, land banking is a common practice. Over the past half-decade the central government gives directives to the Metropolitan, Municipal and District Assemblies (MMDA) to acquire tracks of land known as land banks. These proposals have featured prominently in the annual budgets of many assemblies over the years. The purpose is to acquire and reserve lands for future government projects within the towns and cities.

r) Minimum Density Zoning/Standards

Zoning regulations, typically implemented as minimum lot sizes, are one of the primary land-use policies used to manage urban spread. For instance, Newburn and Ferris (2016) perceived minimum density zoning as contrasting with the traditional approach to regulating maximum densities. By setting a minimum number of allowable units per acre or maximum lot sizes, zoning can be used to promote compact urban development patterns in areas targeted for higher density growth.

Land Use Planning in Ghana has been traditionally developed around zoning regulations. However, due to weak enforcement of these regulations and local by-laws amidst lack of strong local government capacity especially in the peri urban fringes, haphazard development has been difficult to tame thereby challenging the effort of controlling sprawl with this approach. Fig 2.3 a zoning plan in Ghana which carries less information on the 3D components of proposals.

Fig. 2.3 A Land use and Zoning plan of a suburb of Sekondi Takoradi, Ghana



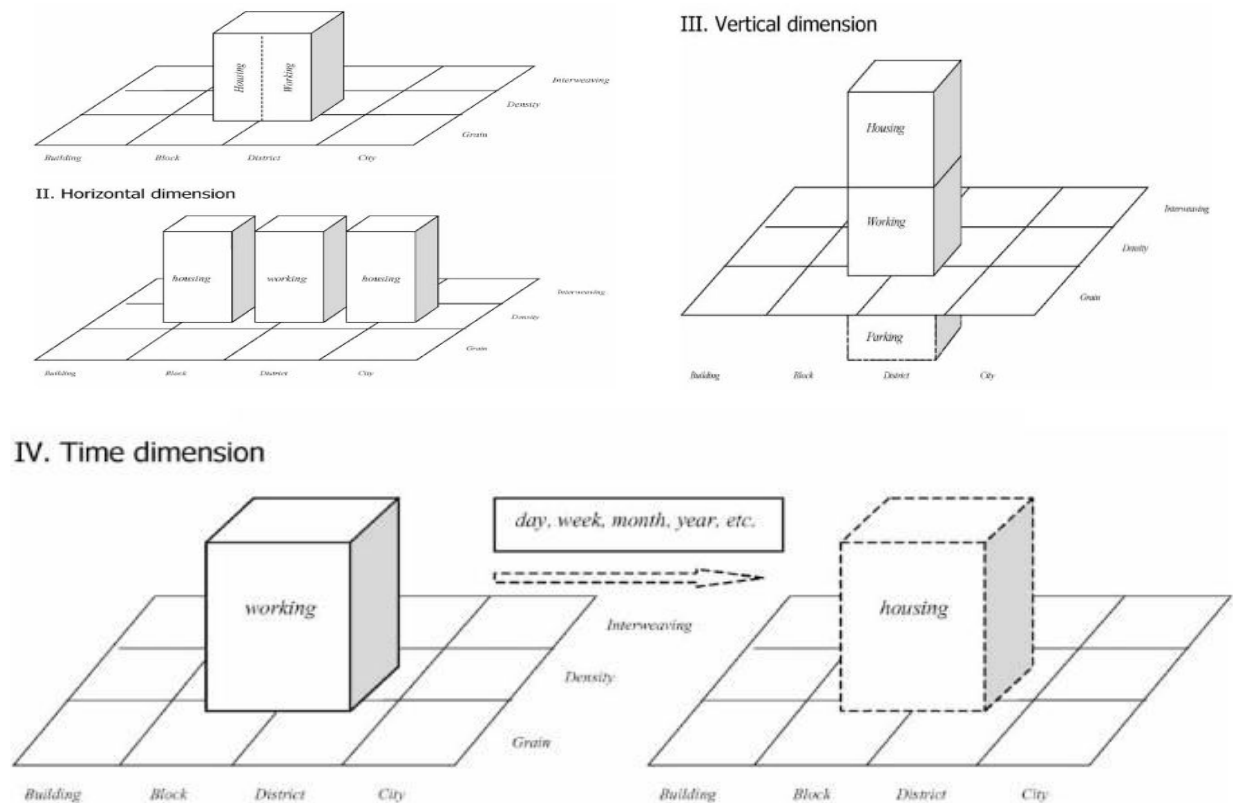
Source; Owusu-Ansah and Atta-Boateng, 2016

s) *Mixed-Use Land Development*

According to Herndon and Drummond (2011) city planners continuously embrace the idea of mixing uses because of its potential to combat sprawl, reduce automobile dependence, preserve open space, support public transit, promote economic development and limit the expense of maintaining and providing infrastructure.

This assertion is valid because mixed land uses can occur on a site-specific basis, individual buildings or complexes can be designed to incorporate a variety of uses. At the neighborhood level, mixed-use development can be made with arrangement of different uses across several blocks or acres of land so that they are not physically isolated from one another (Handy et al, 2002). There are different ways of planning cities with mixed uses as shown in Fig 2.4.

Figure. 2.4. Hoppenbrouwer and Louw's Mixed Use Model



Source: Hoppenbrouwer, 2005 Herndon and Drummond, 2011

t) *Urban Containment Strategies*

Urban growth would always persist either through natural increase or immigration. Therefore metropolitan strategies and policies must be thought out to contain them. For instance, Nelson and Duncan (1995, p. 73 Handy et al, 2002) states;

“Urban containment strategies represent an attempt to control the spatial pattern of development within a community or region. The benefits of successful urban containment techniques can include greater predictability of the development process, more cost-effective provision of public services, encouragement of infill and redevelopment of existing urban areas, reduction of urban sprawl, and protection of agricultural land and environmental resources”

2.11 Summary and Conclusion

The thrust of this chapter examined related literature on urban/metropolitan policies and urban sprawl in general. By so doing it sought to define the various concepts and frameworks as well as indicators of Sprawl in an urban context. The assemblage of various strategies relating to metropolitan urban policy was looked at. It included the use of smart growth approaches, urban containment policies and urban land management strategies.

Findings from this literature review have built the foundation for theoretical research in the study. Most strategies though were taken from the US context have the potential to yield results in countries of the global south especially when they are applied strictly within similar democratic and legal contexts. Even though the structural set up of urban management in the developing countries such as Ghana may be different, several innovative policies identified in the literature could be useful. Though, municipal planning laws in Ghana are weak and rarely enforced, the war on sprawl could be won with stronger innovation in our cities. Sprawl in its entirety knows no geography since its consequences of devastating and depleting rural agricultural lands threaten food security in almost all geographies. This literature work has therefore set the stage for further probe.

CHAPTER THREE

OVERVIEW OF CASE STUDIES (THE METROPOLITAN AREAS OF BARCELONA AND TAKORADI)

3.1 Introduction

Barcelona is a Mediterranean port city, the capital of the Catalanian Autonomous Region and the second largest city in Spain after Madrid, with about 1.5 million inhabitants in the municipality of Barcelona (2017est). Barcelona metropolitan area, the focus of this study has a population of 4.8 million people and covers a total number of 36 municipalities (see fig 3.1). Barcelona has two official languages, Castillian Spanish and Catalan. As well it has a rapidly increasing population of immigrants, mainly from Latin America and North Africa.

While Takoradi is a city comprising the twin cities of Sekondi and Takoradi, it is often known as the Sekondi and Takoradi metropolis, a port city and recently claimed the “Oil City” accolade due to recent discovery and exploitation of crude oil. It has a current population of 709,012 inhabitants (2017 est). The city is the biggest industrial and commercial center and the capital of the Western Region of Ghana, the region endowed with most natural resources in the country.

The chapter seeks to assess the two study areas in terms of the background, the extent of the problem, urban characteristics, growth and policy revolution as well as the situational analysis of the metropolitan governance set up. The essence is to focus on the study area’s vulnerability or otherwise to sprawl amidst metropolitan policy challenges. The chapter finally recounts the comparative urban situational forces likely to have propelled sprawl or lowered its occurrence in the domain of the metropolitan urban management efforts. It dwells more on the Barcelona case as lessons for the Ghanaian planning situation.

Fig 3.1 Municipalities under Barcelona Metropolitan Area



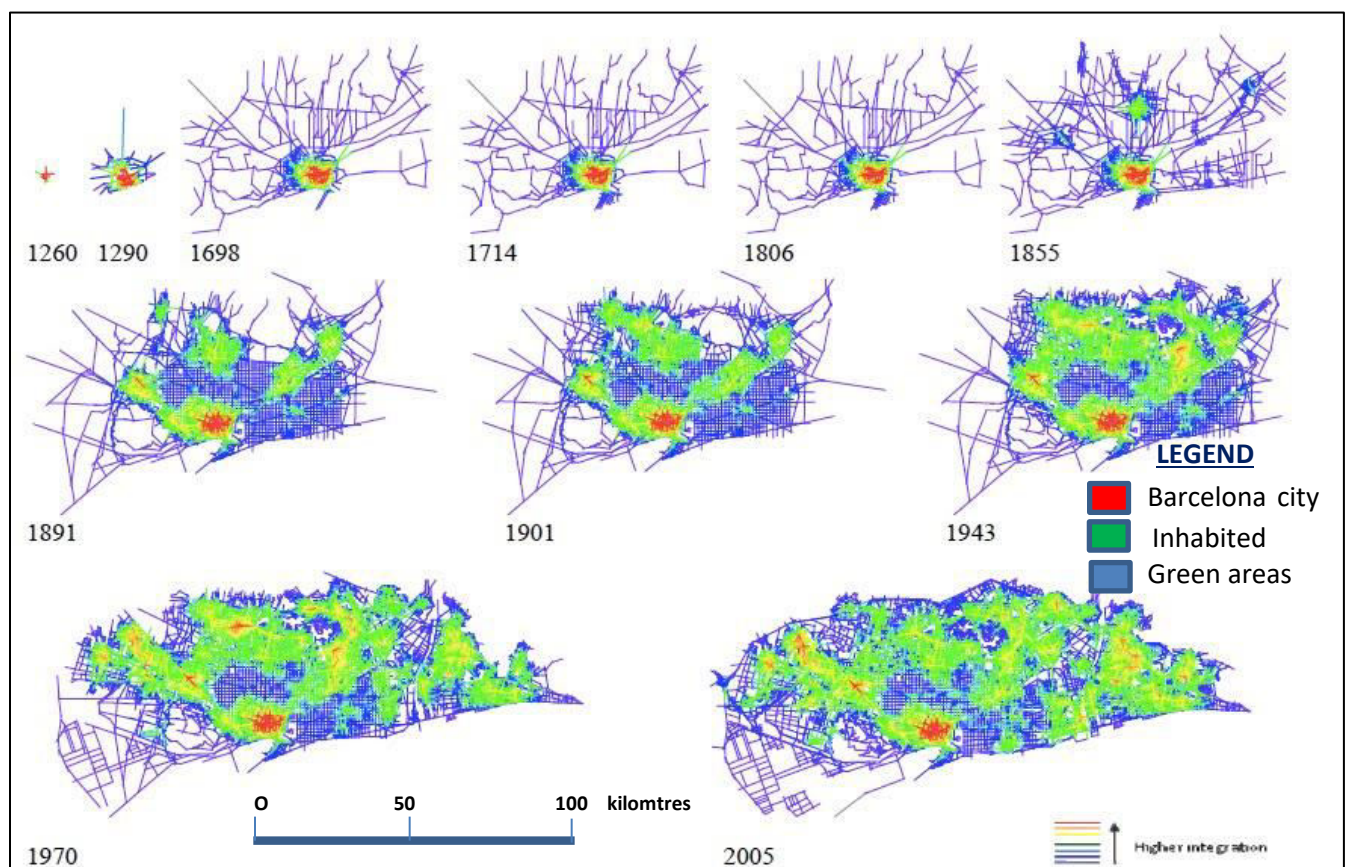
Source; Author, 2018

3.2 Brief History of Barcelona

On the site of a previous agricultural settlement, Barcelona was founded by the Romans. It later subsequently came to form, for a short time, part of the Moorish Caliphate of Cordoba after being ruled by the Visigoths. After the Christian conquest in the late 9th century, it subsequently became the capital of the Kingdom of Catalonia and Aragón and the seat of the counts of Barcelona. It was the central port in an extensive Mediterranean trading empire for centuries (Walker and Porraz, 2003). Barcelona grew to be a typical dense medieval city with locked inside defensive walls and narrow streets. However, in contrast to most similar European cities, it was unable to grow beyond its medieval walls until the middle of the 19th century, after the War of

the Spanish Succession due to military restrictions imposed in 1714. The walls were demolished in 1854 and the *eixample* (expansion) of the city was undertaken in 1859 on the grid-pattern plan of Ildefons Cerdà after permission was given in the 19th century (Walker and Porraz, 2003). A new burst of urban growth especially around the Plaça d'Espanya was set off by the 1929 world exhibition. This small urban boom brought an important influx of migrants, mainly from Galicia, Aragón and Múrcia. Barcelona underwent very little urban growth in the civil war years during the early 1940s (1936-1939), when Spain was plunged into a deep recession. In 1945, a second industrial ring was created through a new wave of industrialization, concentrated around the towns of Badalona, Santa Coloma de Gramanet and Montcada, drawing in several thousands of immigrants a year, especially from Southern Spain (Walker and Porraz, 2003).

Fig 3.2 Barcelona Historical Growth and Land use Change maps



Source; Andrea, 2010

3.3 Barcelona- Location and Physical Characteristics

The present day municipality of Barcelona measures 99.07 km² and has a population of 1.7million people (2016), while the metropolitan area, the 6th largest in Europe has a current population of 5,401,000. Barcelona is located on a plain (412 m) between the sea Collserola mountain range and the Besòs River to the north, and the Llobregat to the south (Àrea Metropolitana de Barcelona, 2017). The restrictions posed by the mountains and the sea tended to physically restrict the expansion of the city, this being one of the main causes of Barcelona's relatively high population density (15,230 inhabitants/km²) as revealed by Walker and Porraz, (2003). However, since the 1970s, the city has expanded beyond these barriers, and has physically merged with other cities. In physical terms, there now exists uninterrupted buildings at high densities and a more or less clear urban continuum, defined by which occupies almost the whole of the coastal plain stretching from Montgat in the north to Garraf in the south, and taking in the valleys of the Besòs Rivers and Llobregat. Administratively, as well as Barcelona municipality, the entire metropolitan area has 36 municipalities after the 2010 law (Àrea Metropolitana de Barcelona, 2017).

3.4 Urban Population Growth and Distribution in the two areas

The population of Ghana is generally distributed into large, medium and small sized settlements. The urban population has shown a dramatic increase from approximately 35% in 1984 to a 42% in 2000 and approximately 51.5% in 2010 (See Table 3.1). Clearly, Ghana is on the ascendancy to becoming predominantly urbanized: a process which is irreversible and unavoidable. Even though the number of urban settlements has increased from 189 in 1984 to 364 in 2000 and 402 in 2006 the phenomenon is not uniformly spread across the national territory. Whilst urbanization is on the increase, Accra and Kumasi stand out with populations above 1,000,000, and the next hierarchy of settlements begins at 300,000 and below (Ghana National Housing Policy, 2015). The Ghana National Housing Policy reveals that extreme majority of these settlements could be described as micro-urban because they have populations around 5,000 – 10,000 or more. Also about 60% of the urban population is concentrated in the golden triangle (Greater Accra, Ashanti and the Sekondi Takoradi) metropolis areas. Whereas there is growth in some of the regions, there is serious decline and stagnation in others, which hitherto used to be thriving urban regions and towns (Ghana National Housing Policy, 2015).

Comparatively, Spain has a higher population density with about 83% of the people living in urban areas as against Ghana's 53 % in 2016. Similarly Ghana has a low population density compared with 93 persons per kilometer square in Spain. It is expected that before Ghana peaks with the highest concentration of population in its urban area sprawl would have run out of control if not curtailed. It also is indicative the extent of loss of farmlands to urban development. Though there have been proposals in the Nation Spatial Development Framework for establishment of growth boundaries, little has been done on implementation.

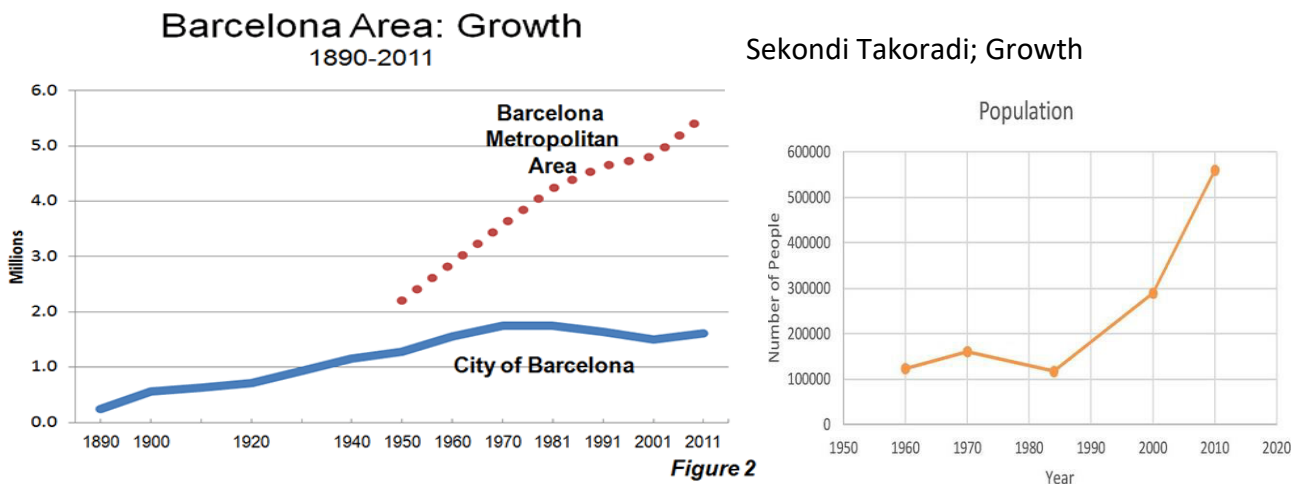
Table 3.1 Urban Population and Densities

	GHANA		SPAIN	
Year	No of Urban Settlements	% of Urban pop	Density P/km2	% Urban pop
2016	955	53.4	93	81.5
2010	735	51.5	94	77.4
2000	489	43.7	82	75.1
1984	344	35.1	78	73.5
1970	203	29.0	68	65.7
1960	135	23.3	61	56.4
1948	41	–	-	–

Source: UN, 2017

Comparatively, the composition of Barcelona's population structure indicates that of an aging population while that of Takoradi exhibits a higher percentage of youthful population (32.6%). One of the main drivers of sprawl has to do with the demographic changes. While most families especially with decreasing household sizes easily own cars in Barcelona, the situation is different in Ghana. However, families are similarly attracted to live in any part of the city including outskirts once they can commute with relative ease. Factors such as family incomes and the existence of improved transport infrastructure are some but a few of the driving forces of sprawl in Barcelona.

Fig 3.3 Urban Population Growth- Barcelona and Takoradi



Source; UN, 2016

As shown in fig 3.3 above, one essential characteristic of the Barcelona type of sprawl is that as the population of the city is being lost to the outskirts and neighboring towns over the past two decades, the municipal population keeps rising due to tourism. The situation can be explained by the increasing costs of rent within the city core due to take overs by tourists, thus leading to a depopulation of the Barcelona municipality. Similarly, Urban sprawl could be triggered by the trend of growth caused by the spillovers from the seemingly gentrified main city core.

Alternatively, the Takoradi metropolis has recorded a steady rise in urban population over the past half-decade but recently in a totally explosive fashion. It has been found to have experienced about 23% growth in population for the past 10 years as against Barcelona's 1% rise in population over the same period.

TABLE 3.2 EXISTING METROPOLITAN POLICIES AND PLANS –BARCELONA

Planning Period	Name	Goal/Purpose
1976	General Metropolitan Plan	aims at the urban planning of the territory that integrated the previous Barcelona Metropolitan Municipal Entity, which included a total 27 municipalities
	Barcelona Metropolitan Territorial Plan (PTMB) is one of the seven territorial zoning plans of General	The aims of this document are to identify new urban strategies, open spaces and to plan mobility infrastructures.

	Territorial Plan of Catalonia.	
	Barcelona Metropolitan Strategic Plan	(PEMB) is a private non-profit association that brings together the 36 municipalities that make up the Metropolitan Area of Barcelona (MAB). Aims to Anticipate future challenges; Provide the necessary changes to meet such to institutions
2011-2020	The Energy, Climate Change And Air Quality Plan Of Barcelona (Pecq)	to provide Public Administration with strategic tools in order to improve citizens' health, as well as to improve Planet health by increasing energy efficiency and reducing greenhouse gas emissions together with other local effect pollutants.
1997	ATM Infrastructure Master Plan The Metropolitan Transport Authority (MTA) is an inter-administrative Consortium of voluntary character created in 1997 and comprised of all the administrative bodies of public transport services	.The purpose of the MTA is to promote cooperation between the public Administrative bodies providing the services and infrastructures of the Public Transport system of the area of Barcelona of which they form
2006-2026	Transport Infrastructure Plan of Catalonia	The Transport Infrastructure Plan of Catalonia (PITC) aims to define an integrated network of roads, rail and logistics necessary to Catalonia with the time horizon of 2026, and aims to extend it to other infrastructure, port and airport in the short term in order to form a complete infrastructure plan Catalonia.
2008-2012	Passenger Transport Plan of Catalonia	The Plan defines the territorial and sectoral lines of action for the coming years in relation to the supply of public transport services in Catalonia and the management of the whole system
1997	ATM Mobility Master Plan .	The Mobility Master Plan (PDM) aims to plan the mobility of the region taking account all modes of transport both people and goods, in accordance with the principles and objectives of the Transport Act.
2013-2016	Barcelona-Commerce Plan	Aims at -based commercial and professional model with a pluralistic, dynamic and innovative diversity of commercial offers. It aims at backing entrepreneurship, boosting shopkeepers' knowledge and training

2005	Urban Wastewater Treatment Programme (PSARU 2005)	The Urban Wastewater Treatment Programme 2005 (PSARU 2005) is a hydrological planning instrument the objective of which is to define all those actions intended to reduce pollution from the household use of water that are intended to enable the water quality targets to be reached.
2008-2010	Barcelona Strategic Plan of Tourism .Turisme de Barcelona, in association with the City Council, decided to set up an ad hoc Strategic Plan Office, manned by a coordinator and a team of managers	responsible for developing the reflection process on tourism and the city throughout the two-year period of 2008-2010.
	BMA Rain water Master Plan	The Master Plan rainwater (PDAP) is the document that plans urban drainage at Metropolitan Area and defines a set of proposals for the management.
	BMA Carbon Management Strategy	The aim of Carbon Management Strategy is reducing carbon footprint of Barcelona Metropolitan Area facilities: waste facilities, mobility facilities and water facilities
2009 – 2016	Metropolitan Waste Management Program	The Metropolitan Waste Management Program 2009 - 2016 aims to prevent waste production and to promote recycling and valorisation of waste.
	Barcelona Strategic Plan for Culture	The Barcelona Strategic Plan for Culture is a pact, an agreement between the various players. It defines the future strategic lines for the city on the cultural level

Source; Barcelona Regional, 2018

From the above table it can be observed that there have been several plans prepared and executed according to the goals and desires of the metropolitan authority, its inhabitants and to boost private investment. However, while most of these plans have chalked several processes in the development of Barcelona there are still a number of challenges. For instance, as mobility and transport plans have culminated into massive infrastructure development on metro, regional rails and roads, the environmental concern is increasingly being heightened with continuous loss of green areas while urban sprawl has been seemingly activated around the major activity nodes. However, the good collaboration between various service administrative structures and a working planning system has kept the compact city model at work. Beyond the mountain ranges embanking the main city is currently receiving the spill overs from the city core.

3.5 Sekondi Takoradi Metropolis – Location and Size

Sekondi-Takoradi Metropolis is located at the south-eastern part of the Western Region of Ghana. The Metropolis is bordered to east by Shama District and to the west by Ahanta West District. the Atlantic Ocean at the south of the Metropolis and at the northern part is Wassa East District. Covering a total land area of 191.7km², Sekondi-Takoradi is the regional administrative capital. Sekondi-Takoradi Metropolis is the most urbanized (over 70%) in the region though it remains the smallest district in terms of land size (Ghana Statistically Service, 2012).

3.6 Relief and Drainage of Sekondi Takoardi Metropolis

The Metropolis is of varied landscape; the coast line has capes and bays, which have been largely eroded. The central portion of the Metropolis is low lying with an altitude of about 6 metres below sea level. Otherwise, the area is undulating with ridges and hills. The geology of the metropolis is that a faulted shale and sandstone resting on a hard basement of, gneiss, granite and schist. The faulting system has marked influence on the land form especially along the coastline which clearly follows the main fault direction of North East. The surface of the Metropolis is fairly watered, with the drainage pattern being largely trellis with minor dendrite forms. Two main rivers, the Whin and the Kansawora rivers flow through the metropolitan area while the lagoons are Butre and the Essei (Ghana Staisical Service, 2012) . The Essei lagoon lies between Ekuasi town and the city of Takoradi. The pre-dominate species of fish that are found in these rivers and lagoons are tilapia and mud fish. The Atlantic Ocean serves not only as sources of food and jobs for the people of the Metropolis it also provides recreational needs for the people notably during the festive occasion i.e. Christmas and Easter celebrations (Ghana Statically Service, 2012).

3.7 Impacts of Geography and Settlement Morphology - the Dilemma of Sprawl

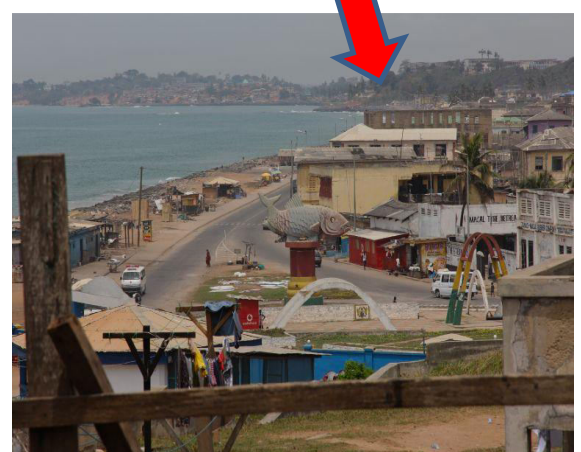
Bounded to the south by the sea, Takoradi metropolis has a spiral growth away from the coast. The growth seems to have ballooned in recent times due to rapid urbanization, a consequence of Oil exploitation in coast of the gulf. The settlement structure has been characteristic of the nature of topography along the coast from Essipon to the Whin river in the extreme west end. The major roads interspersed also flow the same direction of east west from Accra the capital city and administrative capital of Ghana.

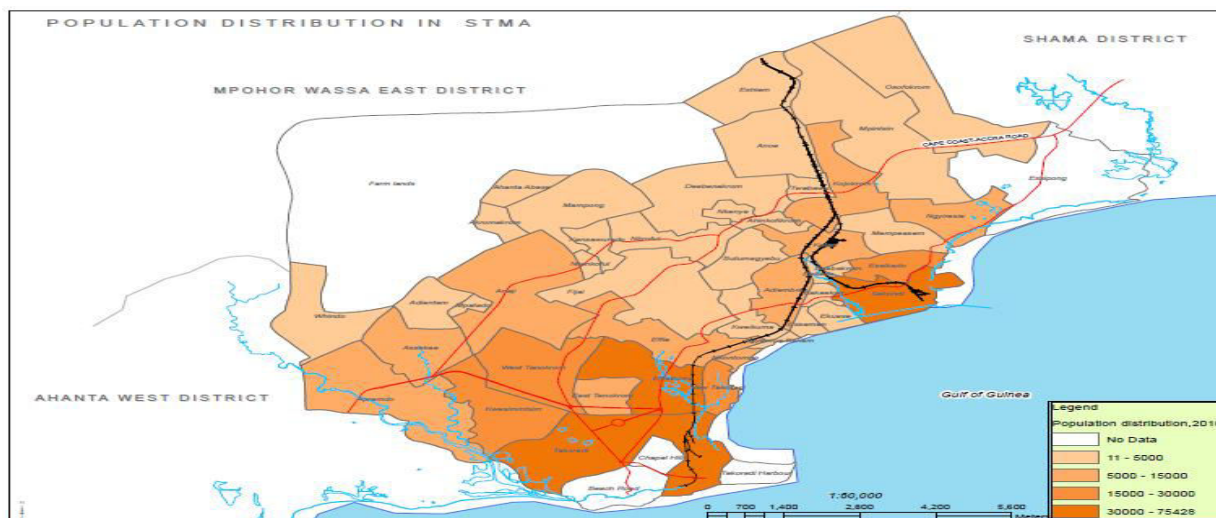
The urban core which is made of a commercial circle known as the Takoradi Market Circle is one attraction point on daily travels for basic needs, thus the direction of flow of traffic during the

day. However, there is a certain degree of polycentricity at specific distances from the CBD. These nodal cores have grown from a merger of several villages founded from the 18th century.

Urban sprawl has been pervasive in these nodal areas where the transiting indigenous villages exist in a continuous conurbation. There are several factors at play here but the principal driving factor is the availability of land for development. The disorganized housing market has fuelled the increasing quest for owner occupiers; built and occupied by owners. The land ownership system is not left out of the blame. Land has over the years been less regulated and can be acquired by anybody for any development in the Sekondi Takoradi metropolis with little attention on redevelopments or renewal. Sekondi for instance has almost been deserted and left to decay. There is no existing metropolitan policy on urban renewal and reconstruction of the old city. However, the quest to expand new areas is left uncontrolled and hardly regulated owing to the weak planning and enforcement regimes.

Fig 3.4 Administrative Map and Population Density- Sekondi Takoradi Metropolis





Source; Sekondi Takoradi Metropolitan Assembly, 2015

3.8 SEKONDI -TAKORADI URBAN NETWORK (STUN)

The Sekondi-Takoradi Urban Network (STUN) includes all or part of six districts: Sekondi-Takoradi (STMA), Shama, Ahanta West, Mpohor, Wassa East and Komenda Edna Eguafio Abirem. STUN is one of the more populous urban networks (80 percent urbanized). STUN is made up of six urban settlements that are only 26 km apart on average in size and range from about 6,000 to 590,000 inhabitants. Sekondi-Takoradi, is the most populous with 90 percent of the urban population. It is made of Agona Nkwanta with 14,000 people; 17 km from Mpohor with about 11,000 people; and 28 km from Daboase with about 6,000 people. Dixcove and Daboase are the furthest apart (50 km) while Daboase and Assorkaw Essaman are the closest (10km). STUN's also has a population of 120,000 with rural communities. Spanning within 5 km from the main coastal trunk road connecting STUN to Accra STUN has 83 percent of the rural population coming from the hinterlands.

3.8.1 STUN's Demographics

STUN's population, both urban and rural, is increasing rapidly. With only four percent of Western Region's land area, its share of regional population grew from a quarter to a third between 2000 and 2010 and could well reach 50 percent by 2035. Its total population and urban population grew faster than that of the nation and the region, 4.8 and 4.6 percent per year; its urban population grew by about 220,000 people and may increase to about 760,000 by 2035. All of its urban settlements are growing, with the exception of Daboase. STMA, known as the "oil city" since the recent discovery of oil, grew at three percent between 2000 and 2010—by 210,000 people over the decade. Agona Nkwanta and Dixcove grew at 3.4 and 2.8 percent respectively

while Mpohor grew slowly (1.4%). Between 2000 and 2010, in contrast to most of the country, STUN's rural population grew at 6.5 percent annually, from about 65,000 to 120,000 and may reach half a million by 2035. This rate of growth was significantly higher than the national rural average of 1.3 percent and strikingly higher than the national urban population growth rate. This may be due to an increase in rural based activities such as small scale mining and plantation of rubber and oil palm. STUN is the densest network in the country, with about 8,400 people per square kilometre (p/km²) in 2010.

3.8.2 Key problems

A recent STMA spatial development plan, prepared with support of Global Communities, identified problems and opportunities in the city. Key problems include: traffic congestion, particularly on the coastal road in the built-up part of the twin city; inadequate public transportation options; inadequate urban services, public facilities and housing; high risk of floods and inadequate protection of natural areas; poor civic design. Problems related to the port include poor access and congestion and lack of land for port and port-services expansion.

3.8.3 Key strategies

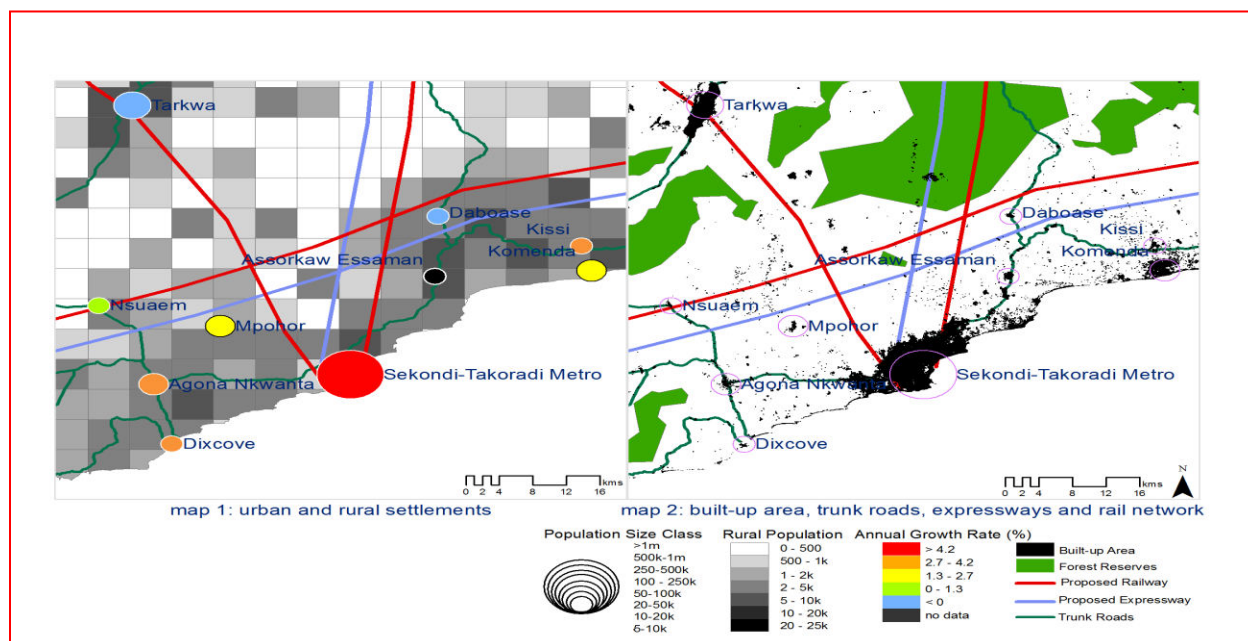
The STMA plan adopts a "structured continuity" concept that (i) promotes re-development of existing areas and extension of already-developed areas and (ii) restricts peripheral development not served by existing infrastructure. The plan also advocates a "two-centre city"—the Takoradi CBD and the Secondi port. It defines four, nested, growth zones: zone 1 comprises the two city-centres; zone 2 is the old residential areas including fishing villages as well as public and commercial facilities; zone 3 includes new residential areas, farms and vacant land; and zone 4 is mainly Volume II Ghana National Spatial Development Framework 2015-2035 3-77 farm and parks. While the structure plan does not include a map, its key spatial recommendations, which are endorsed by NSDF, include the following:

- A green belt to preserve existing open space, including wetlands;
- CBD strengthened with upscale offices and retail;
- upgraded historic core areas to include improved housing;
- Sub-centres developed as activity nodes;
- Mixed-use development along main radial corridors;
- Public transport to reduce urban sprawl and reliance on private vehicles;
- Land allocated for small and medium scale enterprise;
- redeveloped derelict and vacant land and properties.

The Sekondi Takoardi urban enclave according to the National development framework is the fastest growing urban corridor in Ghana. The area has undoubtedly been boosted by oil discovery and exploitation in 2011. Invariably, the metropolis has witnessed a lot of planning interventions since the commencement of oil exploitation. However, the rate of haphazard sprawls tells the story of poor implementation of these spatial plans in Ghana. From the Western Regional Spatial Development Framework, the Sub Coast Development Framework to the Sekondi Takoradi Spatial Development Framework little has been achieved in terms of comprehensive implementation of the plans. The cumulative effect of the non-implementation is a widespread unauthorized, disorderly growth in most parts of the city. A lot of reasons such as weak enforcement of planning and building regulations, lack of adequate capacity of metropolitan government to execute plans and projects and rapid urban population growth are among the challenges.

At the national level, the National Spatial Development Framework has made proposals for the development of the Takoradi oil enclave. Among these proposals include ambitious, transport sector development projects such as express ways, rails, and road infrastructure to link the nearby peri urban districts which would in effect seek to offload the pressure from the Takoradi metropolitan city core. The map in figure 3.5 shows these proposed projects. However, little efforts are being made towards implementing these proposals since over four years after formulation.

Figure3.5. Proposals for the development of the STUN and rural urban connectivity plan



Source; NSDF 2015-2013

TABLE 3.3 THE PLANNING INSTITUTION AND PLANNING APPROACH IN STUDY AREAS

	Barcelona	Takoradi(Ghana)
Planning law	1956 first national planning legislation (Ley del régimen del suelo y ordenación urbana) amended Act in 1975. 1992 Planning Act Specific to Catalonia, the relevant planning legislation is:-the Ley 23/1983, de política territorial, for regional planning, and -the Text refós de la Lleid'urbanisme 1/2005, dated 26 July 2005, for local development Planning.	1945Cap 84 First Town Planning Ordinance repealed by the 2016 Land Use and Spatial Planning Act. Local Governance Act 936 which replaced the Act 462 of 1993.
Planning institution	The municipalities are vested with the responsibility of implementing the system of land classification within their own administrative limits, through the preparation of a local development plan known as a plan general municipal or pla d'ordenació urbanístic municipal under the Catalanian legislation.	Metropolitan, Municipal And District Assemblies (MMDAs)are vested with function of planning authority with the department of Physical Planning mandated as the secretariat of this function The Sekondi Takoradi also passes specific by laws on development control.
Role of the local plan	The local development plan identifies “general systems” within the spatial limits of the municipality taken to include communications and other infrastructure and technical services, open space, community facilities and different environmental systems e.g. hydrological systems, coastal systems, etc.	The local plan details the land use areas, facilities, protected areas, green areas and boundaries within the city. The structure plan precedes the land use plan also known as the local plan. The structure plan which is made of broad land uses also precedes the spatial development plan.
Sectorial plans	Plans sectorial are prepared by the respective departments with responsibilities in specific areas, such as mobility, ports, airports, infrastructure, etc	Some specific departments prepare plans for the development of their sector. For instance the Urban Roads Department, Feeder Roads, Education service, Health service.
Urban regeneration policy	•Royal Legislative Decree 2/2008, approving the 2007 Planning Act (Ley 8/2007 de Suelo)•Preamble to	No specific urban regeneration policy has been prepared for the metropolis. However,

Context	the legislation refers to: -Need for sustainable urban development -Minimising green field development -Encouraging brown field development -Advantages of compact rather than disperse and diffuse urban form	infilling through change of use has been taking place by the Physical Planning Department from time to time.
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Source: Author's Construct, 2018.

3.9 The Policy Approach to Spatial Planning in the Study Area (Barcelona and Ghana)

In assessing the capacity to manage sprawl in the study areas, the efforts differ widely within the two contexts. It therefore means that the dichotomy in approach between Barcelona (an example of the developed neoliberal set up) and the global south is more evident in the planning and implementation of spatial plans. To understand sprawl better and the urban policy effects at curtailing or managing the phenomenon requires an assessment of the different approaches to the problem. The essence is to appreciate the resource challenge as well as the critical planning requirements needed to handle the situation in each case.

As the majority of all future urban growth will occur in the global South, in particular Sub-Saharan Africa, there is a clear need to 'unlock' Southern theorisation to better understand how planning can better respond to the challenges brought by rapid (sub) urbanization (Brown, 2017). While the goals and agenda of the planning effort for instance will be to achieve a contained urban growth and increased density as a model of the European planning system, Ghana has been engaged in efforts to formalize the rapidly urbanizing urban economy which is being challenged by the high number of people lacking formal education and inadequate capacity to deliver effective spatial planning and implementation by authorities. The below table 3.4 shows the nature of the problem

Table 3.4 Characteristics of Plans

	Barcelona	<u>Ghana</u>
Planning Governance system	• Relatively capacitated & coordinated planning systems • Effective enforcement Regimes	• Incapacitated and uncoordinated planning systems • Ineffective enforcement regimes

Demographic context	• Slow urban population Growth • Low densities	• Rapid urban population growth • Relatively high densities
Mode of urbanization	• Formal systems	• Overlapping informal/ formal systems
Planning Goals	• Urban containment • Increasing urban density	• Opening up access to safe and serviced land • Maintaining high urban density
Environment and Development Agenda	• Green agenda (climate change mitigation, environmental protection, etc.)	• Green' agenda and 'brown' agendas (increased access to land outside of ecologically sensitive lands/ hazard-prone areas)
Knowledge Base	• Formal planning 'experts'	• Informal and formal knowledge co-production
Governance modalities	• Distributive justice	• Fragmented urban governance

Source: Brown, 2017

It is important to note that Brown's work as shown in the table 3.4 may not represent a totally reflective situation of the real happenings in both areas, it showcases a good description of systems and functions characteristic to both the developed Mediterranean context and the third world situation. However, in terms of local governance, its planning systems may not fully be capacitated and coordinated since there are still challenges in fragmentations between regional and municipal functions, coupled with EU directives as against locally politically charged ideals. Relatively, the Catalonia situation is a huge improvement from the Ghanaian West African conditions in terms of management and capacity to deliver planning goods. Similarly, modalities in governance, environment and development targets have similar approaches while the consequences of inefficiencies in these efforts are the same on Urban sprawl.

3.10 Nature of Urban Growth in Ghana, Takoradi

In Ghana, urban sprawl manifests in different ways in the built environment. While the construction of structures is haphazard and disorderly due to weak enforcement and development control, the entire housing and production of shelter is shielded in individual tastes and access to land, building materials and timing of construction. In most of the new and sprawling neighbourhoods it is evident that uncompleted structures make up the majority of the buildings in these areas. As shown in the satellite images below, most of the sprawling structures

are at different stages of completion.



Plate 3.1 Scatted and Haphazard Physical Developments in Ghana. Source; Satellite images

3.11 General Causes of Urban Sprawl

The phenomenon of urban sprawl is more pronounced and features predominantly in the urban growth process of the developing world. The situation is different in the West owing to relatively stable urbanization trends and improved urban infrastructure development.

The causes are discussed under the main headings of society, Economy, Governance, Transport and Land. This seeks to make a comparative analysis so as to inform the study on the driving forces.

Table 3.5 Causes of Sprawl in Barcelona and Ghana (Takoradi)

	Barcelona	Ghana
Society	Aging Population Declining household size Growth of suburbs, e.g. Sant Just Desvern. Mature families move for improved housing and a higher quality of life	Youthful population, increased in car ownership, high taste for owner occupier, insecurity at centre, changing family system
Economy	Globalization , high economic growth European integration, cheap energy new shopping malls: e.g. Gran via 2, taking advantage of an increasing car-shopping culture, rising living standards	Low economic growth, poor housing market,
Governance	Legislation & regulation	Weak land use planning

	Weak land use planning Public subsidies for home ownership	systems and enforcement
Transport	High-speed rail link due to improved infrastructure Airport expansion: to cater for increase in flights, developed public transport system, low cost of fuel	Increasing car ownership, poor public transport system Traffic congestion
Land	Local geography and environment. Organized land ownership and acquisition system	Cheap land prices at suburbia, customary land ownership system easing access by usufructs,

Source; Author, 2018

Under the above five headings, various reasons have contributed to some form of sprawl in both areas. As the summaries in table show; changes in population characteristics such as low household sizes in Barcelona, and rising incomes have influenced the taste to live in independent housing estates. Also while in governance, laws and policies are readily enforced in the Catalanian context, the reverse is true for Ghana.

It can therefore be concluded that some of the factors leading to sprawl are different depending on geography. In Ghana, it is the result of a weak economy and low infrastructure delivery which in turn influences haphazard growth. More importantly, the consequence of rapid urbanization in a developing world context remains the dominant challenge which had been experienced in Barcelona in the 1990s and currently in Ghana.

3.12 NATIONAL PLANNING POLICIES

National planning policies and regulations play a central role as the origin and direction of municipal and metropolitan development processes. This assertion is dependent on the kind of government run by the country. For instance in a unitary democracy like Ghana, where local governments exercise little or no autonomy, central government policies from the top bind local authorities down the ladder. Though, there exist district level bye laws, the national laws are supreme and considered first over the local. Alternatively in a highly autonomous region of Catalonia, the local level regulations and policies reign with a somewhat balanced multi scalar regional institutional system. Here, urban policies seek to integrate responses by articulating policies implemented throughout the territory. Similarly, it is highly difficult for central and municipal governments to come up with effective local planning solutions in isolation. Urban policies nonetheless rely on initiatives generated at different levels of government (supra-state,

state, regional and local). Various policies on spatial development in both context on urban planning, transportation, sprawl and polycentricity in both areas all target developing a sustainable urban environment (See table 3.5). However, the difference in outputs and outcomes of the plans are measured by the capacity to implement them to the letter. As Barcelona 's word reference city shape has attracted international attention as a result of effective implementation of sustainability proposals, the story is different in the West African context of Ghana where there is little or no implementation over the years.

Table. 3.5 National Spatial Planning Policies in the two areas.

Theme	Barcelona	Ghana
■ Urban planning in the sub urban	Diversification in access and usage schemes to achieve complex, cohesive urban units: - 60% subsidized housing - 40% free-market housing - 10% of the housing area devoted to commercial and service uses, encouraging territorial diversity; agricultural & non development	Adopt city-region planning and management. The government will have to establish an integrated, inter-jurisdiction, city-region planning and management body. Establish an urban growth containment boundary:
Transport and mobility	Roads and rail. reducing the differences in accessibility and connectivity and boosting passenger transport. Also produce Infrastructure Plan for Transport	■ Establish and strengthen development corridors: Development corridors, linked to ring roads, will have to be designated to concentrate new, high density, urban growth
Reducing sprawl and increasing densities	Conserving the landscape for its value to society, as a legacy, and as an economic asset for the territory. Restraining land consumption. Encouraging an effective housing policy. Target an average density of 50 homes per hectare.	Promote high densities: Promote compactness: "Compactness"
■ Policies for urban rehabilitation	a) Improving public spaces and creating green spaces. b) Rehabilitating and equipping the communal facilities of buildings. c) Providing facilities for collective use. d) Incorporating information technologies into buildings. e) energy efficiency, savings in water consumption and recycling of waste.	Strengthen the central business district (CBD): A city-region's CBD is fundamental to its well-being.

■ Polycentricity	Protecting and boosting the urban legacy that brings structure to the territory Bringing in regulatory and spatial-guideline measures for second homes. Encouraging new developments to be compact .Reinforcing the nodal structure of the territory through urban growth.	Invest in other urban centres: Centres—places that provide housing, jobs, schools, shopping, and recreation that are close together—provide many and diverse opportunities to the largest numbers of people and are efficient users of land, energy and infrastructure.
Mobility modeling	Organising mobility more as a right than as an obligation. Facilitating the deployment of public transport by making the settlement pattern accessible to all.	Promote transport-oriented-development, or TODs: A high-density mixed-used developments. Increase accessibility and connectivity

Source; Author' s Construct, adapted from Pallars, 2005, NSDF 2014.

3.13 Impact of Comparative Spatial Planning Policies on Sprawl in Both Areas

The metropolitan areas have demonstrated a certain degree of commitment towards regulating urban growth and curtailing sprawl. However, the efforts differ from one metropolitan area to the other. For instance, with a strong economic and institutional capability in the case of Barcelona, more policies have been implemented towards revamping the regressing urban growth city cores while injecting innovation and technological advancement in the development of new urban enclaves. In the case of Ghana, Takoradi, frantic efforts are being made towards planning the sub urbanization with the new here tier planning model which led to preparation of Spatial Development Frameworks such as the Sub Coastal Spatial Development Framework, Western Region Spatial Development Framework(WRSDF) fitting into the National Spatial Development Framework(NSDF), Thus specifying the hierarchical composition of the 3 tier planning system. However, these plans though beautifully prepared are wasting in shelves and hardly implemented.

Moreover, in Takoradi , a significant drive of urban sprawl has been largely due to an explosive growth in urban population, and its associated consequences which have changed the urban landscape of the western corridor (stretching through Apowa to Agona). However, controlled population growth to as low as 1.2% for a decade in Barcelona has made infrastructure development to meet the pace of urban growth. Notwithstanding, the development of public transport and cheap energy has propelled a significant amount of sprawl in the sub urban Barcelona, the phenomenon has minimal impacts compared to Takoradi in Ghana.

Both metropolitan enclaves have exhibited a certain amount of weakness in land use controls. However, the trend has been more pronounced in Ghana than in Barcelona. No doubt the disorganized housing market, the estate regime and the land tenure system contributed immensely to unregulated urban sprawl. Since the 1992 Olympic Games, Barcelona has remained an attractive city for tourists and business people. This has boosted the local economy especially the estate sector leading to several renewals taking place at the city's main nodes. Invariably, making the city core more habitable and attractive is one proven way of restraining people from spurring into pre urban areas, thereby calming the rate of sprawl. This trend may slow the taste of moving outwards but cannot completely eliminate sprawl.

3.14 Conclusion

This chapter sought to assess the situational analysis within the context of metropolitan efforts and natural occurrence of sprawl. It has been revealed that both areas exhibit distinct characteristics with regards to the governance, economic, demographic, geographical and historical compositions driving and managing sprawl.

While sprawl may have irreversible consequences to the quality of life of the urban dweller, the kind of economic growth and development contributes immensely to how these consequences are managed in both areas. For instance while low capacity in the local governance ability to enforce planning regulations are assumed to drive unbridled sprawl in Takoradi , the reverse is true for an economically advanced metropolis of Barcelona with adequate capacity to plan, enforce and regulate policies towards orderly spatial growth of the city. The reason for the initial planning of the city into a compact one according to findings was for both social and economic reasons; to keep the city needs and interaction closer to each other so as to promote social intercourse while boosting growth. Takoradi Metropolitan area has lessons to learn in the spatial planning sphere specifically in the aspects of plan enforcement, implementation of containment policies, housing and infrastructure development.



Plate. 3.2 Barcelona Streets, Nord Train Station, Picture by Author, 2018
BARACLONA SUBWAY MAP



CHAPTER FOUR

ANALYSIS, IMPLICATIONS, RESULTS AND DISCUSSIONS

4.1 Introduction

The analyses in this chapter consist of the comparisons and examinations of data gathered from the previous chapters on the situation in Barcelona and Sekondi Takoradi metropolitan areas in terms of sprawl control and the impact of metropolitan policy. These are assessed with the study of possible drivers of sprawl that are related to the hypothesis so as to propose answers to the main research question in the research. The aim of this chapter is therefore to set the stage for findings and recommendations relating to the urban sprawl situation in both contexts and juxtaposing it on the governance and policy regimes of the study areas, thus answering the second and third research questions. Discussions on this would include the implications of specific planning policy actions and the results of the implemented ones. The overall objective is to draw lessons for application in Ghana's urban planning system.

4.2 Urban Morphology and Infrastructures

The interplay between biophysical, economic, cultural, socio-demographic and political contexts are key factors that shape city morphology. In understanding how settlement morphology differs at the regional scale in Barcelona a comparative analysis of urban settlement design features, such as topography settlement patterns and infrastructural networks (e.g. roads, railways) and most importantly, the elevation gradient is an important element shaping urban form and settlement expansion in the Mediterranean region. For example, in promoting more compact centres and urban growth mainly along the sea coasts or in the main lowland, rugged topography and sloping landscapes reduce the availability of buildable land. The two cities have been characterized by different elevation profiles. Sekondi-Takoradi metropolitan area shows an undulating topography with more than 40% of the surface area classified as hilly (>40 m elevation) while Barcelona is in an intermediate condition between hilly, mountainous and alluvial plain, with buildable land distributed along the sea coast and in some internal flat areas in correspondence with river valleys of regional importance (Tombolini et al , 2015).

It is important to note that upon the rugged topography of the Barcelona metropolitan setting, there is a laid down planning approach to developing the city. This process has been seen to be systematic collaborative and timely. From industrial land provision and management in the post Olympics times to cooperate cluster projects and recently, the digital and knowledge hubs. This shows a significant transition in the city's planning approach over the years. Lessons from the

coherent policy implementation and monitoring which has been associated with the Barcelona example amidst a multi scalar implementation schedule according to the local to regional planning institutions are worth adapting for Ghana.

4.3 HOUSING- GHANA AND CATALONIA

The role of housing cannot be underestimated in the urban growth process. The city of Barcelona currently implements a robust housing policy expected to last till 2025. The Right to Housing Policy has several innovative programmes for provision of housing and home maintenance. As shown in Table 4.2, Public investments subsidies and grants have been implemented to improve access to housing for families and individuals. Apart from the motivation to increase access to housings as a significant measure of quality of life, the Barcelona municipality has been working to bring housing close to the doorsteps of the people by setting up many housing offices which receive clients and complaints of house owners.

Compared to Ghana, the Barcelona model is a significant step ahead in the efforts to satisfy the shelter needs of the population. The implications of the robust urban housing policy measures impact is that of urban sprawl. On one hand it addresses the changing taste and preference of people who increasingly like to settle out of the urban core in order to avoid the hustle and bustle of the centre. An established housing regime could redirect these families to where those estates have located under renewed and reconstructed sites close to work than opting for locations outside the urban cores. On the other hand, these organized housing estates direct the taste of occupants who have little options and thus are made to live in these estates which might not necessarily locate within the urban core due to high land costs and difficulty of accessing unoccupied lands within the restricted urban centre.



Plate. 4.1 Housing in Barcelona and Ghana Source; Author, 2018

Table 4.1 Barcelona Housing Stock and Performance of Right to Housing Policy (2011-2025)

	2011-2015	2016-2020	2021-2025	TOTAL	DATE / %	
Buildings with renovation grants	3,162	3,887	2,360	6,248		buildings
Flats benefiting from renovation grants	51,234	45,642	28,324	74,957		flats
Total resources mobilised in renovation grants	263,730,000	291,515,000	177,025,000	468,540,003	75%	€
Public subsidy in renovation grants (BUILDINGS)	85,100,000	116,606,000	70,810,000	187,416,001	62%	€
Buildings included in renovation agreements		365	885	1,250		buildings
Flats included in renovation agreements		4,375	10,625	15,000		flats
Total resources mobilised in renovation agreements		29,166,667	70,833,333	100,000,000	16%	€
Public investment in housing included in agreements (COMMUNITIES)		17,500,000	42,500,000	60,000,000	20%	€
Flats benefiting from interior grants		1,756	4,077	5,843		flats
Total resources mobilised in grants for flat interiors		15,894,000	36,690,000	52,584,000	8%	€
Public subsidy in grants for FLAT INTERIORS		15,894,000	36,690,000	52,584,000	18%	€
TOTAL resources mobilised	263,730,000	336,575,667	284,548,333	621,124,003	100%	€
TOTAL public investment	85,100,000	150,000,000	150,000,000	300,000,001	100%	€
Buildings with accessibility grants (includes interior sections)		1,275	974	2,249	30%	buildings
Flats with accessibility grants (includes interior sections)		15,835	12,908	28,743	30%	flats
Public subsidy for accessibility (includes interior sections)		45,000,000	45,000,000	90,000,000	30%	€
Flats renovated with public support in Neighbourhood Plan areas		1,500		1,500		flats

Source: Barcelona's Right to Housing Policy, 2016

4.3.1 Housing

The below table 4.2 summarizes the situation of housing in the two study areas. While housing remains one of the huge challenges in urban areas, access to housing and the housing market is one of the main factors driving the amount of sprawl in cities.

Table 4.2 Housing Situation

	Barcelona	Ghana
Housing Ownership	EU statistics in 2007 states that about 80 percent of the Spanish population live in their own houses. About 20 percent are renting. However the trend grew from 20% to 24% in 2013. The change has been most pronounced among young and urban Spaniards. The portion of people under 30 living in rental housing has grown from 38.1% in 2007 to 49.4% in 2011,	47.2% of dwelling units are occupied by their owners, while 31.1% live in rented premises, 20.8 % are occupied rent free. The results indicate that ownership of living units is mainly by private individuals, household members and relatives who are not household members. Only

		3.7% of dwelling units are owned by employers (public and private)
Funding	Directly provided through local authority; through public agency (PMHB) Grants ; Complementary funding from Regional Government Subsidies ; from central gov't Public Guarantees ; from central gov't	Personal savings 60%, Mortgage loans 9%. Social housing less 10%
Challenges	In Barcelona, there is a 25% low-income households face challenges in access to private housing and protected housing. in 2015 1, 693 were sleeping on the streets • Persons living in housing without legal permission, • Persons living in substandard and overcrowded housing.	On the supply side the factors include: • Land cost and accessibility; • Lack of access to credit; • High cost of building materials; • Outdated building codes and standards; and • Lack of effective regulatory and monitoring mechanisms.

Source; Ghana National housing policy, 2015 and Barcelona Right to Housing Policy 2016-2025

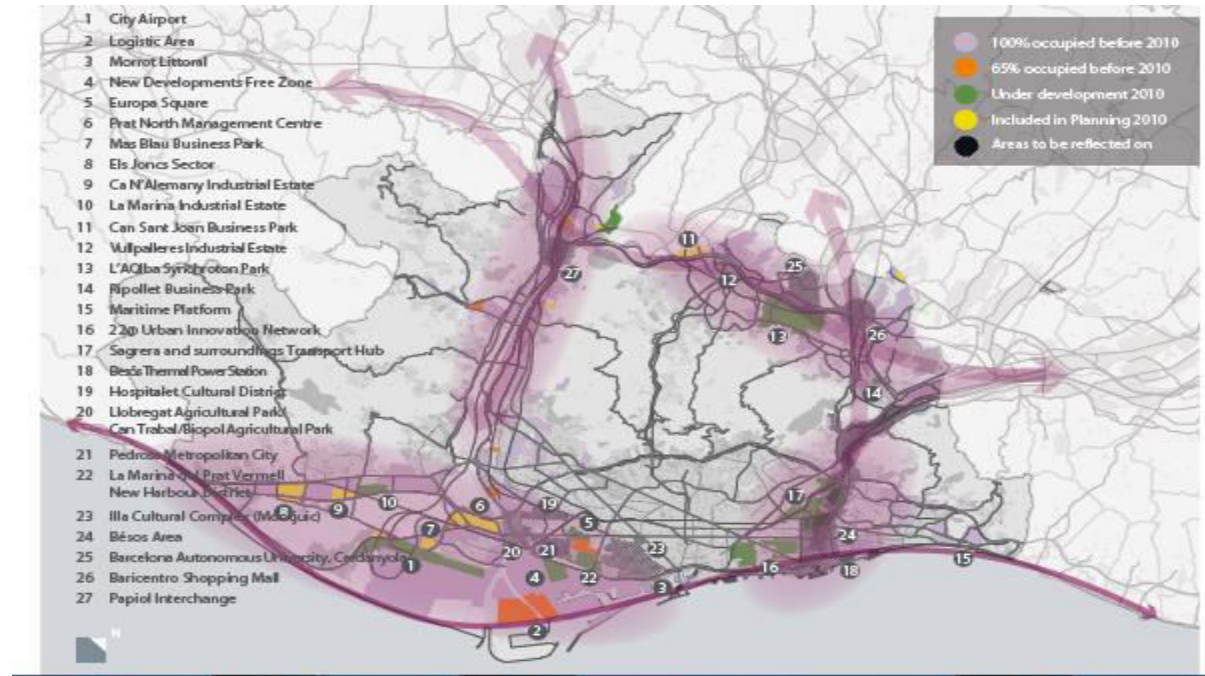
4.4 Barcelona-Polycentricism –The Transportation Factor

The origin of a planning vision of polycentricity as a development strategy for Catalonia is rooted in the early 1930s. The 1932 *Pla de distribució en zones del territori català: Regional Planning* and the 1936 *Divisió Territorial de Catalunya* departed from a remarkable distrust of the city's industrialization by strong social, cultural, and political movements and advocated for a planning strategy to counter the increasing concentration of people and economic activities in the capital city of Barcelona. Although polycentric development was understood in the 1932 *Regional Planning* as a development strategy aimed at limiting Barcelona's growth through the decentralization of economic activities and population, the 1936 *Divisió Territorial de Catalunya* advocated for a set of central places across Catalonia's entire territory to limit the negative consequences of rapid urbanization caused by industrialization.(Masip-Tresserra, 2016). It is worth noting that decentralized economic development had the tendency of creating sprawl since it allows for a possibility of expansive commercial land uses away from the central core.

Large urban agglomerations are a complex spatial configuration of places and flows that are polycentric by nature. Recently, the focus on agglomerations' polycentric structure has attracted a great deal of attention for its likelihood of influencing sprawl to an extent.

The below map (Fig. 4.2) shows the dominant activity areas attracting daily travels of people in Barcelona among the polycentric nodes. The seemingly rectangular zone of movements from the city Airport area in west to the maritime platform areas in the east and further away to autonomous University of Barcelona at Cerdanyola del Vallès are the main routes of concentrated human activity in the metropolis.

Figure 4.2 Strategic Nodes in the Barcelona Metropolitan Area



Source; Barcelona Regional, 2018

4.5 Measuring Urban Sprawl

It is evident from table 4.3 that discontinuous residential areas have increased in the Barcelona province by +11.2%. In 2006, the built-up areas of the Barcelona province present a substantial amount of discontinuous residential areas (40.7%), outpacing continuous residential areas, which occupy almost 30% of the total built-up areas. Similarly the urban area of Takoradi has expanded for more than 60 percent since 1970s.

Moreover, the Barcelona province shows a higher increase in industrial and commercial areas (+58.5%) than the Takoradi area (+39.2%) within the same timeframe. Transport areas (roads and railways, ports and airports) have substantially increased in the Takoradi area since the 1970s

Similarly, commercial and light industrial land uses have increased for over 60 percent the same period even though there have been some relocation of mechanic shops from the airport area to various dispersed nodes around the Takoradi city.

By comparing years 2000 and 2010, open and agricultural areas have similarly decreased in both metropolitan areas. However, the proportion of artificial surfaces to the total area reaches 11% in the Barcelona while that of Takoradi has been more than 42%. Although the Barcelona metropolitan area is almost two times larger than the Sekondi Takoradi metropolitan area (63600 hectares compared to 38500 hectares), in absolute values (in Considering densities of both areas, the Takoradi metropolis can be considered, in relative terms, more dispersed: both the absolute values and proportions of continuous and discontinues areas show that urban sprawl is more consistently found in the Takoradi metropolis.

Table 4.3 Land Cover classes (1990-2006) for Barcelona Province

Land use classes	Barcelona province (NUTS3 area)						% 1990 2006 Variation
	1990 (ha)	%	2000 (ha)	%	2006 (ha)	%	
Continuous residential areas	24 717.0	35.1	24 720.0	30.7	24 894.0	29.3	0.7
Discontinuous residential areas	31 154.0	44.2	34 032.0	42.3	34 649.0	40.7	11.2
Industrial and commercial areas	10 048.0	14.3	14 287.0	17.8	15 930.0	18.7	58.5
Roads and railways	85.0	0.1	614.0	0.8	621.0	0.7	630.6
Ports	854.0	1.2	1140.0	1.4	1155.0	1.4	35.2
Airports	518.0	0.7	626.0	0.8	1359.0	1.6	162.4
Mineral extraction sites	1703.0	2.4	2168.0	2.7	2300.0	2.7	35.1
Dump sites	187.0	0.3	311.0	0.4	351.0	0.4	87.7
Construction sites	338.0	0.5	754.0	0.9	1714.0	2.0	407.1
Green urban areas	277.0	0.4	312.0	0.4	335.0	0.4	20.9
Sport and leisure facilities	574.0	0.8	1428.0	1.8	1782.0	2.1	210.5
Total urbanised areas	70 455.0	100.0	80 392.0	100.0	85 090.0	100.0	
Total urbanised areas	70 455.0	9.1	80 392.0	10.4	85 090.0	11.0	20.8
Agricultural areas	252 499.0	32.6	243 715.0	31.5	239 867.0	31.0	
Forests, semi-natural lands and water bodies	439 598.0	56.8	450 462.0	58.2	449 612.0	58.0	
Total area	774 569.0	98.4	774 569.0	100.0	774 569.0	100.0	
Total urbanised area to total area		9.1		10.4		11.0	

Source: EEA, Pagliarin, 2015

The study of land cover in Barcelona area reveals a number of variations quite significant for the study of the extent of sprawl in the city. As the above table shows, a significant change had taken place in both roads and highways sectors and green urban areas since 1900s. Apparently there seem to exist a direct relationship between the development of these infrastructure and rate of sprawl. Most green areas are being invaded in and around the city in favour of the modern Euro linked rail and road projects. As a dimension of sprawl, transportation sprawl has bolstered the spatial sprawl of the city. As the city becomes more mobile the worse the sprawl. This is because these developments further propel the opening up of the hinterlands to urban development which in turn influences the amount of sprawl in these areas. The policies of enhancing rail and road transport targeted at promoting mobility and the quality of lives of the people are good

initiatives. However, these initiatives if not backed by concrete spatial planning and compliance may throw the city out of containment.

4.6 OUTCOMES, ANALYSIS ON URBAN CONTAINMENT STRATEGIES ON SPRAWL

Barcelona

The institutions of planning and administration responsible for the running of spatial affairs of the metropolis are the Barcelona Metropolitan Authority, the Regional Planning Agency of Barcelona, the Barcelona Municipal Government, and the City Council. These institutions have specific roles in the overall spatial policy formulation and implementation. For instance, the interview conducted on the 3rd May, 2018 on these institutions revealed that while some are specifically in charge of research and planning others are into the mainstream planning and zoning of the metropolitan area. The Barcelona municipal government is the administrative and political headquarters of the municipality of Barcelona which limits itself to the core Barcelona city. It is important to note that these institutions use a collaborative approach in the handling of the city affairs. The advantage of this has been the ability of the city authorities to work with minimal overlaps. Though the municipality of Barcelona is the smaller core of the city which virtually shares no clear boundaries with the metropolitan areas, collaborative efforts have yielded successful citywide projects. It is therefore virtually difficult to physically segregate the municipal area from that of the metropolitan area. In terms of sprawl, the approach has possibly managed to resettle people who have recently vacated the city core into the outskirts due to the increasingly expensive nature of housing in the municipality. It thus means the population is increasingly being deflated outwards causing certain amount of sprawl even though these according to the Director of Spatial Planning in the Metropolitan Authority (Fransec Magrinya), have been mainly propelled by the economic factor and massive investment in city infrastructure.

“The highest hit area in these new transformations is the Poblenou area where factory sites are currently being converted into a new technology zone. This trend is increasingly going to diversify the Barcelona economy into a tertiary knowledge base one from industrial production, we are moving away from industrialization to service led growth” - Fransec Magrinya

As part of the booming economic drive, the ports have played a significant role as southern Europe's largest embarkation and point of convergence for Mediterranean cruises. Zona Franca is one of the largest and most dynamic Europe's industrial zones. With new infrastructures the estate is undergoing major transformation attracting huge multinational manufacturers. The Zona Franca cannot be left out as one of the major drivers of the economy of Barcelona.

Lately, the role of tourism cannot be underestimated. According to a Geography and Tourism Professor of the university Rovira i Virgili interviewed (Antonio Russo);

“Tourism has overwhelmed the city in recent times causing a lot of detrimental effects such as gentrification and loss of population from the city to the hinterlands. Particularly worrying is the fact that the industry does not offer sustainable jobs.”

On a field visit to the city on data collection, the apparent show of touristic buses and movement of tourists was conspicuous as can be seen in the blow photographs; (see Plate 4.2)



Plate 4.2 Barcelona Tourism, Source; Author, 2018

The implementation effectiveness and efficiency of urban/metropolitan policies according to Professor Russo, is the political will and funding. Most of the massive urban infrastructure such as rails, technology hubs are private sector driven. He however mentioned the motorways and a number of rails as EU integration projects. The private investors are part of the success stories of Barcelona. Of course the direction and monitoring as well as the security of their investments are guaranteed by the autonomous government of the Catalonia. According to him even though there are no specific sprawl targeting policies, the planning authorities are doing a great job at ensuring the high densities that we see.

The collaboration among institutions of the various governments implementing the metropolitan policies of Barcelona are really yielding results even though there are challenges. For instance, the city authorities are working hard to integrate parks and greeneries at specific radius of the urban

area which according to him is currently an issue of concern due to the extremely compact nature of the cityscape

Metropolitan policy implementation challenges according to the Metropolitan Director of Spatial Planning cannot be limited to the success of the specific project but also the general economy of the Catalanian region. Barcelona is almost recovering from economic crisis. Meanwhile, the instability of the Sahel Sahara regions have always posed a threat to the Mediterranean. The struggle to cope with the challenge and nuances of a swelling numbers of immigrants trooping into the area leaves much to be desired. In the nutshell, the vibrancy of the economy nonetheless pools government's revenue and private sector investments which in effect have impacts on the success of implementation of metropolitan projects and programmes in the Barcelona metropolitan area.

In terms of the success of specific urban containment policies like the brownfield reuse and compact development, Barcelona has implemented a number of successful projects on brownfield sites. These include the building of the Olympic village on industrial sites and brownfields near the waterfront, the transformation of 200 hectares of industrial land and brownfields in the center of Barcelona into an area of the highest urban and environmental quality, creating 3,200,000 m² area for new business, 4,000 for social housing, and 114,000 m² for new green spaces, with 145,000 m² new facilities

4.7 Sekondi Takoradi, Ghana

The institutions of planning and administration responsible for the running and management of the Sekondi Takoradi metropolis are the Sekondi Takoradi Metropolitan Assembly, the Department of Physical Planning, the Works Department and other decentralized institutions. These departments and institutions have specific roles in the overall spatial policy formulation and implementation. For instance, while the department of Physical Planning formulates the overall spatial policy of the metropolis through zoning and land use planning, the preparation of spatial development Frameworks, structure plans and local plans, the Works Department is in charge of the day to day implementation of the local plans on the ground through organized periodic development control operations. The Lands Commission controls the land ownership and documentation of public, vested and family lands. The Sekondi Takoradi Metropolitan Assembly (STMA) is the administrative and political headquarters of the metropolitan area. It is important

to note that these institutions do collaborate in the delivery of most planning programmes. The two departments of Physical Planning and Works are the actual departments in charge of the running of city planning. They therefore need to work to improve collaboration for efficiency. In terms of sprawl, the traditional land use planning approach of zoning is the only available option used by these institutions to manage the redistribution of people in space especially in newly developing area. It thus means that the weaknesses and inefficiencies or either wise of these institutions will have a cumulative effect on sprawl in the metropolis.

According to the Director of Physical Planning in the Metropolitan Assembly(Kofi Yeboah), the driving forces behind the physical growth of the city has been that of the oil businesses, rapid urbanization and the increasing investments in industrial activities probably due to the government policy of “One District One Factory”. The highest hit area in these new transformations is the Ahanta West Corridor, suburban to the metropolies . The massive housing and expansion of commercial activities along the Apowa Agona route are evident of the booming economies which have attracted rural urban migrants over the past four years. As part of the booming economic drive, the previous government had initiated a massive port expansion project to give way for the export led port to transport and dock a higher number of containers through the port of Takoradi.



Plate 4.3 Takoradi Port Expansion Project, Source; gettyimages.com

Adding to the challenge of the inefficient implementation of urban/metropolitan policies is the result of weak logistical and funding. Apart from the delay in releases from the central government which eventually stalls most projects, the collaboration with private sector as the

engine of growth is not yielding enough outcomes. Though there are seemingly successful ones signifying fruitful partnerships with private sector such as the Takoradi market stalls, Konkompe mechanical shops, a lot other partnerships are being challenged. Meanwhile, government has tried to create the enabling investment for private businesses to thrive.

In the Western region even though there are no specific sprawl targeting policies, the planning authorities have been working to implement local plans and ensure unauthorized development are reduced to barest minimums.

Metropolitan policy implementation challenges according to the Metropolitan Director of Spatial planning (Kofi Yeboah) cannot be limited to the success of the specific projects only but also the general economy of the Sekondi Takoradi metropolitan area.

“Though efforts are being made to ensure urban containment strategies are implemented on time, the biggest threat to control of ever-increasing sprawls is rapid urbanization which have propelled a continuous swell of the urban population over the last decade”- Mr Kofi Yeboah

The struggle to cope with the challenges, nuances and consequences of the increasing numbers of rural migrants trooping into the metropolitan area is far from over. However, government efforts at taming the physical spread of the city is yielding results amidst difficult challenges of low revenues, weak capacity of the spatial planning department to deliver its mandate due to low number of professional Planning personnel and the problem of logistics.

In terms of the success of specific urban containment policies, the Takoradi, metropolis apart from the traditional planning instruments have not specifically implemented any containment policies on sprawl. However, there has been several infilling, change of land uses and redevelopments within the metropolis. The Mpintsin ranges which were reserved because its inhabitable nature due to rugged topography has been recently re-schemed and leased out for private developments. There are no brown field schemes in the metropolis.

4.8 Discussions

The study reveals a relatively less dispersed residential pattern in Barcelona case than Takoradi's though the demographic deconcentration and suburbanisation phenomenon occur in both cases. Moreover, the stabilizing urban population growth rate in Barcelona as seen from the demographic characteristics of an aging population structure is a clear dichotomy from the West African situation of a youthful population structure driving a rapidly urbanizing growth. These

call for absolutely different approaches to policy to meet the infrastructure, housing, transportation and governance needs of the two distinct situations.

However, the irony of the findings is that while the slow and relatively stable urban growth evident in Barcelona is receiving a massive infrastructure, housing and transportation boost probably from EU integration, a fast growing urban situation in Ghana has access to fewer infrastructures and housing thus creating a completely chaotic urban environment in Takoradi. There is also a plausible connection between municipal and metropolitan fragmentation and the occurrence of urban sprawl. Invariably a territorial, multi-scalar governance approach has revealed the political and planning mechanisms that can substantially explain the different occurrence of urban sprawl in both considered case studies.

In Barcelona and Takoradi, local governments behave quite differently though both aim at a single goal of meeting the needs of the citizenry. Each takes localised planning decisions over urban development, hence producing a scattered, almost 'self-forming', territory, as highlighted also by other researchers (Christiansen and Loftsgarden, 2011; Mann, 2009; Settis, 2010).

Evidence has proven that the municipal government bears the most prominent responsibility for urban sprawl, in the case of Barcelona. Micro-transformations and land use changes carried out in other municipalities located within the metropolitan boundaries to obtain a competitive edge could drive a certain degree of sprawl, a scenario applicable in the Western contexts not prevalent Ahanta West and Takoradi.

Moreover, the differential factor that can explain the less dispersed character of urban development in the Barcelona case than in that of Takoradi is the natural barrier of the city's topography and the role that higher institutional levels play in the planning process. The adopted theoretical framework proved to be particularly valid in distinguishing the role those actors at different governance scales play with regard to land regulations and land management, thus potentially influencing the occurrence of urban sprawl. This situation contrasts sharply with that of the Ghanaian context where regional governments have little or no control over actual land use developments at the municipal or metropolitan levels and therefore exerts little or no influence.

Although, overall, it is the local scale that owns the greater amount of authority regarding land management strategies, deciding on how to bargain land for development, and attracting a certain type of inhabitant in order to find their 'competitive niche' within interurban competition dynamics with other surrounding municipalities, it is the broader, institutional context, where these localised decisions on planning are taken, to be distinctive. The more incisive role that the regional government plays in the Barcelona case, issuing legally binding approvals of municipal plans, mediates, and mitigates, land management strategies put into place by local governments is a different set up from the legally binding regulations on Metropolitan, Municipal and District Assembly (MMDA) plans being initiated and implemented under local regulations in the assemblies' own political and administrative domain in the case of Ghana.

In addition, the normative framework appears more advanced in the Spanish case than in the Ghanaian one, where a more modern and up-to-date national legislation, and a more consolidated regional territorial planning, facilitated land protection and control over land use change. In particular, since the 1980s the Catalan regional government has made efforts to reform territorial organisation and planning, for instance by defining territorial 'ambits that would have been endorsed with a territorial plan. In contrast, the Ghanaian metropolitan framework on land use appears to be insufficient and inadequate to face the challenge posed by the current high magnitudes of urbanization and urban expansions. Because of diverse institutional frameworks, the Western Region in Ghana has been less able as Catalonia to provide a sound and strict policy framework to bind local governments' urban choices over land use planning. Private actors will therefore have more room for action when the regional government has a limited capacity to bind local municipal choices on urban development. Such conclusion should be taken into account specifically for the two considered case studies or, potentially, for other developing economies.

Moreover, the findings in this research is related with the focus on planning tools and plans, which have been considered as the key instruments through which the institutional actors typically put into place their choices over land use and management of urban areas. However, other documents, data and devices may have been considered during a sufficiently broad period of time, such as the number of building permits, the number and type of newly built houses, homeownership rates, the territorial distribution of household incomes or average housing prices, opening up other and various insights. In particular, analyses on the Catalan housing situation highlighted the emergence of a tremendous effort than that of the Ghanaian situation

having only existing non-implemented housing policy. The Catalan government with active private sector led growth has over the years poured into the market a great amount of new dwellings, whose prices however kept growing (for example, between 1997 and 2010) housing prices in Barcelona are more than doubled) (Pagliarin, 2015). These critical analyses are relevant as far as evidence has shown how most of the dwellings built in 1990s and 2000s had a suburban character (Muñoz, 2007).

Finally, it must be remembered that among the driving forces influencing sprawl, governance dynamics plays a key role in urban planning and land management. However, the housing market, macroeconomic situation, globalization and international competition, transportation, local taxation and the financial market are other conditions that also have tremendous impacts on metropolitan policy decisions on urban sprawl management.

FINDINGS AND CONCLUSIONS

5.1 Introduction

The purpose of this research was to explain the driving forces behind urban sprawl and metropolitan policy in both western perspectives and the global south (a West African context). Thus the project narrowed down to Barcelona metropolitan area, the capital and commercial hub of Catalonia and the Sekondi Takoradi metropolis, the capital and economic hub of the Western Region of Ghana. Knowledge such as this may be a prerequisite for implementing measures to manage the irreversible urban phenomenon of sprawl. A broad range of literature has been examined as well as some selected interviews on the subject. As per the hypothesis of the study, Barcelona has been confirmed to have better managed sprawl due to their institutional and metropolitan governance capacity and locational advantage.

Further findings from the work have been summarized into five main headings namely demography, economy, transportation, geography and policy framework.

5.2 Demography

Population characteristics may well define the nature of sprawl in urban areas. In this study, there exists wide disparities in the population structure and growth in the study areas. While the rate of growth of the Barcelona population has remained steady over the last 10 years (at 1%), that of Sekondi Takoradi has grown for over 23 percent within the same period. The rate of growth in the Ghanaian case has become perhaps an explosive situation since oil discovery and exploitation in 2011. Apart from the natural increase, rural urban migration has contributed greatly to the current rapid population in the city. Decreasing household sizes as the case of Barcelona shows has contributed to increasing household income which in turn bolsters private car ownership thus influencing the taste to settle out of the core Barcelona municipal area.

5.3 Economy

The economic condition of the study area plays a crucial role in driving the kind of sprawl at play. In the case of Barcelona, EU policies on integration are driving a significant amount of growth in infrastructure which in turn has impacted on a certain degree of sprawl in Catalonia. However, strict spatial planning and compact city efforts over the last few decades have controlled the amount of sprawl in an economically vibrant urban environment in Barcelona. The post Olympics exposition has changed the entire cityscape since the year of host. However, the service led

growth and a digital city agenda is currently driving the economic policy of the Barcelona metropolis.

5.4 Transportation

Transportation-related factors are necessary assumptions behind urban sprawl.

Improvement in train, metro, bus and car have contributed to greater freedom and opportunities for individuals in Barcelona, businesses and industry. Despite these changes, there are still challenges related to pollution due to increased dominance of private car usage. Technological improvements and falling transport costs have contributed to offloading businesses and industries to locate outside city centers and infrastructure nodes in the core Barcelona municipality. In Ghana as well, it is now possible to travel longer distances within the same travel time due to increased car ownership and the untamed expectations from oil activities. The public transportation system is not a deciding factor in Takoradi since most of the infrastructure is underdeveloped. The crave to have good education for their children and good health is influencing the taste of most working class people to locate in the outskirts of Takoradi city while working in nearby districts such as Ahanta west, Mpohor and Shama.



Plate 5.1 Adif Local Train Network. Source: Barcelona Regional, 2018

5.5 Geography

The matter of geography including the nature of the land in the urban area has an impact on the extent of urban development and sprawl. Topography of the land as a geographical feature is particularly prominent in the findings of Barcelona where mountainous embankments accentuated the urban physically spread into a compact city. The mountain ranges can be seen as

a kind of physical barrier beyond which development becomes relatively more sparse and less concentrated due to high cost of construction thus contributing to the seemingly controlled sprawl of Barcelona ,

5.6 Policy and Regulatory Framework

Policy and regulatory framework have played a major role when it comes to driving forces behind urban sprawl. In terms of management of urban development one of the key driving factors are governance and policy regulatory frameworks. For Instance, in the case of the Barcelona metropolitan area the Planning and enforcement is anchored on a multi- scalar governance system which is efficient in making urban development a highly controlled activity within the desired limits of the city. In Ghana however, poor planning and weak development control has led to high levels of unauthorized developments and haphazard developments hence a chaotic urban environment in the Takoradi city. Again, Barcelona comparatively has precisely stronger control over land-use policy, and less fragmented coordination in organization, despite the many planning institutions and agencies in Catalonia. In Ghana however, though the local government body such as the Metropolitan Assembly exercises the mandate of development control with its lower level structures such as urban councils, these efforts are less effective due to capacity challenges and logistical constraints. However, recently due to deployment of GIS technologies under the World Bank sponsored Land Administration Projects Phase I and II, GUMPP projects, and Global Communities, a number of improvements are being realized.

Though Catalonia had a long history of planning since the post war industrial revolution, in recent years great efforts have been made to have instruments – like the Barcelona metropolitan territorial plan, which sets out the general lines of what this territory should be like – and other plans have been passed or are being drafted like the Sustainability Plan for the AMB (PSAMB), the Master Plan of Infrastructures (PDI) or the Urban Mobility Metropolitan Plan (PMMU). It must also be appreciated that this new reality has arisen from the Barcelona Metropolitan General Plan (PGM) in 1976. However, the first planning law in Ghana was the Cap 84 of the colonial government known as Town and Country Planning Ordinance of the 1945. The law has been recently replaced by the land Use and Spatial Planning Act, 925 of 2016. By this Law a Land Use and Spatial Planning Authority was established in Accra to enforce regulatory and supervisory roles on the municipal and district assemblies. Moreover, the Western Region of Ghana has had the most land use and spatial planning policy interventions yet it has since not seen any substantive implementations. These include the Western Region Spatial Development

Framework, the Subcoastal Spatial Development Framework and the Sekondi Takoradi Metropolitan Spatial Development Framework.

5.7 Conclusions

The research has dissected and exposed a number of realities as well as disparities between the phenomenon of sprawl in the developing country Ghana and the western example (Barcelona). The study would build knowledge on policy and decisions aimed at forestalling and taming the drivers that trigger sprawl in an internationally comparative way.

The metropolis of Barcelona has changed substantially over the last few years. The arrival of international immigration, the rapid transformations in family settings in terms of composition and organization, the ageing of the population and the social impact of the current economic crisis have given rise to new approach to metropolitan policy. Unlike Sekondi Takoradi metropolis which is growing extensively without as many physical constraints, Barcelona is founded within topographical challenge compelling the compact city agenda in the building of the metropolis. The upgrading and expansion of major infrastructures like the airport or the port, and commitments to strengthening and creating new central urban areas in all the territory cannot be downplayed in the role of metropolitan policy in the urban sprawl process. Of all the major transformations carried out in these years, maybe the most significant was the run up to the Olympics for its great impact on the central city and also on other municipalities in the metropolitan area of Barcelona.

On the other hand, Sekondi Takoradi in Ghana has a youthful population and grappling with threatening unemployment, with a polluted urban environment and few urban infrastructure worsened by rapid urbanization, weak planning and enforcement regimes which culminate into unbridled Sprawl and a seemingly explosive atmosphere rendering metropolitan efforts less effective. The Takoradi situation has been recently described as 'explosive' due to the discovery and exploitation of oil in the off shores of the city.

The findings also conclude on the outcomes of the dichotomy between the West African context of sprawl and a Mediterranean European situation. The drivers, consequences, outcomes and potentials brought about by the dynamics of demography, governance, economics and policy can be turnaround for future research by delving into fine details in terms of the origins of the causative agents and impact of policy decisions on sprawl control and management in the two cases.

Lastly, it is important to note that urban sprawl persists in all economies whether rich or poor. However, the consequences, on waste of urban land, depletion of green areas, threatening consequences of climate change due to soil sealing, among other findings are a threat to urban sustainability and thus the consequences are the same no matter the context.

BIBLIOGRAPHICAL SEARCHES

- Avendaño Guillem Espriu (2015) the Area Metropolitan Barcelona (AMB) Flows and edges Metropolitan Strategic *Reflection. Building the Metropolitan Barcelona, Strengthening the Local Government*. Retrieved from;
http://www3.amb.cat/repositori/REM/REM_curt%20ENG.pdf
- Bhatta B.(2010) Analysis of Urban Growth and Sprawl from Remote Sensing Data, 17 Advances in Geographic Information Science, Springer DOI 10.1007/978-3-642-05299-6_2,
- Blackman Tim (1995, 2003) *Urban Policy in Practice*. Routledge, London. E-library. Retrieved from;
http://shora.tabriz.ir/Uploads/83/cms/user/File/657/E_Book/Urban%20Studies/URBAN%20POLICY%20IN%20PRACTICE.pdf
- Brian H Roberts (2007) *Changes in Urban Density: Its Implications on the Sustainable Development of Australian Cities*. Retrieved from; https://sallan.org/pdf-docs/OZ_changesinurbandensity.pdf
- Banai Reza and DePriest Thomas (2014) Urban Sprawl: Definitions, Data, Methods of Measurement, and Environmental Consequences. *Journal of Sustainability Education* .Vol. 7: 2151-7452. Retrieved <http://www.jsedimensions.org/wordpress/wp-content/uploads/2014/12/Banai-DePriest-JSE-Vol-7-Dec-2014.pdf>
- Brown Donald (2017) Challenging the conceptual boundaries of the compact city paradigm in sub-Saharan Africa: towards southern alternatives. DPU working paper no. 187 retrieved from; <https://www.ucl.ac.uk/bartlett/development/sites/bartlett/files/wp187.pdf>
- Brueckner K. Jan (2000) Urban Sprawl: Diagnosis and Remedies. *International Regional Science Review*. Volume: 23 issue: 2, page(s): 160-171. Retrieved from;
<https://doi.org/10.1177/016001700761012710>
- Cobbinah Patrick B., Amoako Clifford (2014) Urban Sprawl and the Loss of Peri-Urban Land in Kumasi, Ghana. *International Journal of Humanities and Social Sciences* Vol:8, No:1, Retrieved from <http://waset.org/publications/9997496/urban-sprawl-and-the-loss-of-peri-urban-land-in-kumasi-ghana>.
- Couch, Chris Sykes, Olivier, Börstinghaus, Wolfgang (2011) Progress in Planning - PROG PLANN

- Thirty years of urban regeneration in Britain, Germany and France: The importance of context and path dependency*. VL 75 DO - 10.1016. Retrieved from;
https://www.researchgate.net/publication/251565639_
- Corburn Jason (2004) Confronting the Challenges in Reconnecting Urban Planning and Public Health. *American Public Health Organization*. 94(4): 541–546. Retrieved from
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1448291/>
- Da Gama Torr Haroldo (2011) Environmental Implications of Periurban Sprawl and the Urbanization of Secondary Cities in Latin America, Inter-American Development Bank, <https://publications.iadb.org/bitstream/handle/11319/4956/Environmental%20Implications%20of%20Peri%20Urban%20Sprawl%20and%20the%20Urbanization%20of%20Secondary%20Cities%20%20.pdf?sequence=1>
- Dieleman Frans and Wegener Michael (2004) Compact City and Urban Sprawl, *Built Environment (1978-)* Vol.30 No4 Multifunctional Urban Land Use, pp. 308-323. Retrieved from; http://www.spiekermann-wegener.com/pub/pdf/Compact_city_BE.pdf
- European Economic Area (EEA) (2006.) *Urban sprawl in Europe—The Ignored Challenge*. EEA Report No.: 10/2006. Retrieved from
https://www.eea.europa.eu/publications/eea_report_2006_10
- El Menchawy A. (2008) Urban regeneration in Mediterranean cities: an integrated urban development of Brownfield sites. *The Sustainable City*. V 115. Retrieved from;
<https://www.witpress.com/Secure/elibrary/papers/SC08/SC08012FU1.pdf>
- Ewing, R., Pendall, R., & Chen, D. (2002). Measuring sprawl and its impacts Washington, DC: *Smart Growth America*. Retrieved from;
<https://www.smartgrowthamerica.org/app/legacy/documents/measuringsprawl.pdf>
- Farrera De Pallars, Oriol Nel·Lo (2005) *Catalonia's New Spatial-Planning Policy. The Government of Catalonia*. Retrieved from; http://www.eurometrex.org/Docs/Moscow/Catalunya-Barcelona_Summary_EN.pd.
- Ghana National Spatial Development Strategy (2015-2035), VOL II Overall spatial Development Strategy. Retrieved from; <http://www.ghanalap.gov.gh/files/NSDF-Final-Report-EXECSUM-Vol-III-Final-Edition-TAC.pdf>
- González González María Jesús (2017) Planning, Urban Sprawl and Spatial Thinking *European Journal of Geography Volume 8, Number 1:32 - 43*, Retrieved from

<http://www.eurogeographyjournal.eu/articles/2.Planning%20Urban%20Sprawl%20and%20Spatial%20Thinking.pdf>.

Handy Susan, Robert Paterson, Jumin Song, Jayanthi Rajamani, uchul Jung, Chandra Bhat Kara Herndon Joshua D. and Drummond William (2011) Mixed-Use Development in Theory and Practice: Learning from Atlanta's Mixed Experiences. *Applied Research Paper*. Retrieved from;

https://smartech.gatech.edu/bitstream/handle/1853/40790/JoshuaHerndon_Mixed-Use%20Development%20in%20Theory%20and%20Practice.pdf

Hernandez Palacio Fabio (2012) Sprawl and Fragmentation the Case of Medellin Region In Colombia. *TeMA Journal of Land Use, Mobility and Environment*. DOI: 10.6092/1970-9870/762 Retrieved from;

https://www.researchgate.net/publication/277240494_Sprawl_and_Fragmentation_The_case_of_Medellin_Region_in_Colombia

Knieling Jörg (2014) Metropolitan Regions Definitions, Typologies and Recommendations For Development Cooperation. *Discussion Paper Series, Deutsche Gesellschaft für Internationale*

Kockelman Kara (2002) Techniques for Mitigating Urban Sprawl: Goals, Characteristics, and Suitability Factors. Retrieved from; http://ctr.utexas.edu/wp-content/uploads/pubs/0_4420_1.pdf

Litman, Todd (2015), Analysis of Public Policies That Unintentionally Encourage and Subsidize Urban Sprawl, Victoria Transport Policy Institute, *Supporting paper commissioned by LSE Cities at the London School of Economics and Political Science, on behalf of the Global Commission on the Economy and Climate*. Retrieved from; www.newclimateeconomy.net

Manijeh Lalehpour (2016) Research Article; Recognition of management structure and spatial planning in Tehran Metropolitan Area. Retrieved from https://ac.els-cdn.com/S2226585616300024/1-s2.0-S2226585616300024-main.pdf?_tid=06dd87e2-d1dd-11e7-88cf0000aacb35d&acdnat=1511613469_114813606c070f533ad77926948e1e4f

Marshall Tim (2000) Urban Planning and Governance: Is there a Barcelona Model? *International Planning Studies*, Vol . 5, No . 3, 299 –319 , 200 0. Retrieved from;
<http://barcelonacomuns.pbworks.com/w/file/fetch/64049739/Urban%2BPlanning%2Band%2BGovernance.%2B%2BIs%2Bthere%2Ba%2BBarcelona.pdf>

- Ministry of Works and Housing (2015). *Ghana National Housing policy*. Accra. Retrieved from <http://www.gredaghana.org/policy/National%20Housing%20Policy.pdf>
- Nelson Arthur .C. and Duncan James .B. (1995). *Growth Management Principles and Practices*. Planners Press, Chicago, IL.
- Nelson Peter (Nd). Barcelona, Spain. The Complete Integrated City. Retrieved from http://depts.washington.edu/open2100/Resources/1_OpenSpaceSystems/Open_Space_Systems/BarcelonaCaseStudy.pdf
- Newburn, D.A., and J.S. Ferris. 2016. "The Effect of Downzoning for Managing Residential Development and Density," *Land Economics* . Retrieved from; <http://smartgrowth.umd.edu/assets/documents/research/NewburnFerrisDownzoning.pdf>
- Nicolás Barbieri, Xavier Fina et Joan Subirats (2012) Culture and Urban Policies: Dynamics and Effects of Cultural Third Sector Interventions in Barcelona. *International Planning Studies* 15(1):25-35. Retrieved from; <https://www.escholar.manchester.ac.uk/uk-ac-man-scw:90442>
- OECD (2013) Definition of Functional Urban Areas (FUA) for the OECD metropolitan database. Retrieved from: <https://www.oecd.org/cfe/regional-policy/Definition-of-Functional-Urban-Areas-for-the-OECD-metropolitan-database.pdf>
- Onibokun, Adepoju ; Faniran, Adetoye.(1995) Urbanization and urban problems in Nigeria In: Urban Research in Nigeria Ibadan: *International Journal of Innovation and Scientific Research*: 2351-8014. Retrieved from <http://www.issr-journals.org/links/papers.php?journal=ijisr&application=pdf&article=IJISR-14-294-07>.
- Owusu-Ansah Justice, Kufour Atta-Boaten Francisca (2016) The spatial expression of physical Development controls in a fast growing Ghanaian city. *Land Use Policy* Volume 54, Pages 147-157. Retrieved from; <https://www.sciencedirect.com/science/article/pii/S0264837716000351>
- Petter Christiansen and Tanja Loftsgarden (2011) Drivers behind urban sprawl in Europe. *Norwegian Centre for Transport Research Report* 1136. Retrieved from; <https://www.toi.no/getfile.php?mmfileid=17329>
- Polidoro Maurício, Augusto de Lollo José, Vizintim Fernandes Barros Mirian(2012)"Urban Sprawl and the Challenges for Urban Planning. *Journal of Environmental Protection*. 3, 1010-1019 <http://dx.doi.org/10.4236/jep.2012.39117>

- Salet Willem (2007) New metropolitan spaces and metropolitan strategies in the Face of Modernisation. *Metropoles*. Retrieved from;
<https://journals.openedition.org/metropoles/262>
- Sarantakos, S. (1998) Social Research, London: MacMillan Press Ltd. Published by Palgrave
 ISBN 10: 0333738683 ISBN 13: 9780333738689
- Schulze Baing Andreas (2010) Containing Urban Sprawl Comparing Brownfield Reuse Policies in England and Germany. *International Planning Studies*. 15:1, 25-35, DOI:
 10.1080/13563471003736910
- Stone Jr Brian.(2008)Urban sprawl and air quality in large US cities. *Journal of Environmental Management*. Retrieved from:
http://urbanclimate.gatech.edu/pubs/Urban%20Sprawl%20and%20AQ_Stone2.pdf.
- Toderian Brent (2012) 6 Ideas Every City Should Steal From Barcelona. Retrieved from;
<https://www.citylab.com/design/2012/11/6-ideas-every-city-should-steal-barcelona/3998/>
- Tomàs Mariona (2015) Metropolitan Governance in Europe : Challenges & Models. Retrieved from:
https://www.researchgate.net/publication/273759034_Metropolitan_Governance_in_Europe_Challenges_Models [accessed Mar 06 2018].
- Tombolini Ilaria 1, Ilaria Zambon 2, Achille Ippolito 3, Stathis Grigoriadis 3, Pere Serra 4 & Luca Salvati (2015) Revisiting “Southern” Sprawl: Urban Growth, Socio-Spatial Structure and the Influence of Local Economic Contexts. *Economies*, 3, 237-259;
 doi:10.3390/economies3040237
- United Nations, Department of Economic and Social Affairs, Population Division (2014). World Urbanization Prospects: The 2014 Revision, Highlights (ST/ESA/SER.A/352). Retrieved from <https://esa.un.org/unpd/wup/publications/files/wup2014-highlights.pdf>
- UrRahman Md. Ashiq (2016)Research Article Urban sustainability through strategic planning: A case of metropolitan planning in Khulna city, Bangladesh Urban and Rural Planning Discipline, Khulna University, Khulna9208,Bangladesh. Retrieved from
<http://iranarze.ir/wp-content/uploads/2017/08/7425-English-IranArze.pdf>
- Verenini Andrea (2010) *Urban plus Medics*, A blog . Retrieved From
<http://urbanmedic.blogspot.com/2010/07/grids-emergence-and-space-syntax-new.html>
- Van den Berg Leo, Braun Erik (2016) National Policy Responses to Urban Challenges in Europe Retrieved from;
<https://books.google.fr/books?id=OCi3DAAAQBAJ&pg=PA337&lpg=PA337&dq=metropol>

itan+policy+evolution+spain&source=bl&ots=4o0c5hDzub&sig=MkqEeRm269l7g7mHwb
oQ60RQIyA&hl=en&sa=X&ved=0ahUKEwjV78m7gN_XAhWBzKQKHf4ZBL8Q6AEIPDAC#v
=onepage&q=metropolitan%20policy%20evolution%20spain&f=false

Walker *Alex and* Porraz *Bernardo* (2003) Urban Slums Reports: The case of Barcelona, Spain.

Retrieved from http://www.ucl.ac.uk/dpu-projects/Global_Report/pdfs/Barcelona.pdf

Zusammenarbeit (GIZ) Gmb, Eschborn, retrieved from;

[http://www2.giz.de/wbf/4tDx9kw63gma/Metropolitan-
Regions_Definitions_Typologies.pdf](http://www2.giz.de/wbf/4tDx9kw63gma/Metropolitan-Regions_Definitions_Typologies.pdf)

Appendix i

INTERVIEW GUIDES

INTERVIEW GUIDE FOR BARCELONA METROPOLITAN AUTHORITY

- 1) Which is your role in the implementation of urban containment policies?
- 2) Which are the forces that could lead to the spread of Barcelona region?
- 3) According to the High Technology Zone Barcelona plan 2014 of the Barcelona city are implemented brownfield reuse policies for the containment of sprawl?. Who is responsible for the implementation of these policies?
- 4) Do the Catalan government and national legislation influence the process of implementation, the effectiveness, the efficiency of brownfield reuse policies in your region? What are the influences?
- 5) What is the role of the Catalan region and municipalities under Barcelona and other stakeholders in the process of implementation of urban policies ? Do they cooperate in order to deliver the Barcelona urban renewal plan?"
- 6) What is the housing market like? What is its influence in sprawl mitigation?
- 7).In your opinion, is this important for the implementation effectiveness and efficiency of urban/metropolitan policies? Why?
- 8) Does the Barcelona master Plan promote a polycentric approach? If yes do you think that this approach influence the implementation and the effectiveness of these policies? How?
- 9) Do you think that the implementation/effectiveness of these policies could be influenced by European Union directives such as European Spatial Development Perspective?
- 11) What figures do you use in order to indicate that the brownfield reuse Policies and compact development polices in the Barcelona metropolitan area in terms of their efficiency and effectiveness are or are not successful?
- 12 which of these policies are predominantly used in the planning of the metropolitan area?
 - a) Compact development b) infilling b)mixed use development c) brownfield reuse d) others , please specify.....

INTERVIEW GUIDE FOR CITY OF BARCELONA

- 1) Which is your role in the implementation of urban containment policies?
- 2) Which are the driving forces of urban sprawl in the city of Barcelona
- 3) What kind of policies do you use in your city in order to accommodate the demand for new development and to preserve the green areas?
- 4) What is the role of the authority in development control and planning?
 - a.) What kind of difficulties do you face during the implementation of planning policies in your city?
 - b) How is plan implementation like in Barcelona, who are the main actors?
- 5) In your opinion do the government and national legislation influence the process of implementation, the effectiveness, the efficiency of these policies in your municipality? What are the influences?
- 6) How is the housing market in your city? What is its influence in city planning? (i) Land ownership and acquisition. Who owns land? A) State B) families or individuals
- 7) In your opinion, which factors could influence positively or negatively the implementation, the effectiveness as well as the efficiency of urban containment (compact development, mixed use, infill development, brownfield re use) policies in your municipality?
- 8) What is your suggestion for better implementation, effectiveness and efficiency of these policies in your municipality?

*URBAN SPRAWL PROCESSES AND METROPOLITAN POLICY, THE CASE OF BARCELONA AND
SEKONDI TAKORADI IN GHANA*

ABSTRACT

In an increasingly urbanized world there is a rising concern on the consumption of suburban lands, soil ceiling and rationally worsening climate change adaptation agenda propelled by the unsustainable expansion of cities. Low density and discontinuous urban growth is a matter of great concern to city governments, urban planners, sociologists, economists and environmentalists. The purpose of the study was to particularly identify and link the urban sprawl processes, its driving forces and management policies in the developed world to that of the global south (an area which available research has not been able to sufficiently probe. The phenomenon of urban sprawl was analyzed from its origins and driving factors, the different manifestations, the possible solutions of control and the role of existing metropolitan governance policies. The study found that a relatively robust planning and enforcement regime on densification has managed sprawl to a tolerable degree in Barcelona than Takoradi.. It is observed however that no matter the differences in contexts, the consequences of urban sprawl are the same.

KEYWORDS:

Urban Sprawl; driving Forces ; Metropolitan Policy; Urbanization; Urban Governance; Peri-Urban; Densities; Comparative Analysis : Barcelona. Takoradi.

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