SUSTAINABLE URBAN DEVELOPEMNT IN BAMENDA, NORTH WEST REGION OF CAMEROON: CHALLENGES, CONSEQUENCES AND ALTERNATIVE OPTIONS

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By:

FONKI JECENTA NGBEBA

(B.A in Geography)

Matricule 18L683

JURY

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EXAMINER:	**NDI ROLAND**	**(C.C)**	**UY1**

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DEDICATION

To

My beloved family who has been a great source of inspiration and contribution to my success.

ACKNOWLEDGEMENTS

ABSTRACT

Most towns and cities in sub-Saharan Africa, Bamenda inclusive are grappling with the challenges of rapid urbanization and sustainable urban development. This mainly results from improper urban planning policies. These challenges are manifested by way of informal settlements, misuse of public spaces, poor waste management, and occupation of risky-prone areas among others. It was against this gloomy background that this study sets out to investigate sustainable urban development north west region of Cameroon, challenges consequences and alternatives solution. This work set out to investigate why Bamenda is facing urbanization challenges despite the existence of urban management strategies that have been put in place. Three hypotheses were set to guide the study. Research methods and techniques that were adopted and used led to data collection, processing and analysis. Secondary data was collected from published and unpublished documents. Primary data was gotten through field surveys where a total of 152 respondents from 9 selected quarters in the Bamenda municipality provided responses. Additionally, primary data was gotten through, interviews, focus group discussions and observations, where observed phenomena were captured using a digital camera. The data gotten from questionnaires was processed using Microsoft Excel while Satellite images were treated using Landsat (1973, 1988, 2003, and 2023). Inferential and non-inferential analyses were done that pave the way for the testing of hypotheses, drawing up meaningful conclusions, suggestions and policy implementation. The outcome of the data collected, process , analyzed and interpreted revealed that there has been a significant increase in population growth in the Bamenda municipality from 1973 to 2023 that is 34000 population with a growth rate of 9.68% and 594000 population with a growth rate of 3.66% in 2023 which have not been commensurate with proper urban planning policies. The study equally found that some strategies of urban challenges have equally been put in place in the study area though with just 53% respondent aware of the strategies, 42% unaware and 4% of the respondent ignorant of the whole thing. In the assessment of the challenges, it was realized that direct implication of this has been informal settlement and misuse of public spaces revealed by the field studies with 75% of the respondents approving that informal settlement is the order of the day in Bamenda town. Also, poor urban planning have resulted to urban sprawl with visible impacts not even aware of the existence of master plan (68%). Again, waste disposal challenges was noted to be a critical urban challenge in Bamenda which couples with environmental issues (land, water and air pollution) as 39.47% of respondents reveal that the companies assigned to collect waste rarely come around to collect it. It was revealed that they pass just once in week to collect the waste with 21.71% of the respondents confirming the fact. Furthermore, illegal Motor Parks and insecurity challenges (socio-political crisis, since 2016) were noted and confirmed by 88% of respondents to be the outstanding challenges to sustainable urban development in the study area. In the finding of the study it therefore recommends amongst other measures the strict implementation of planning regulations and the development of a roadmap that encapsulates the sustainable city development goals. In addition, the recycling of waste, enforcing pollution controls norms. Furthermore, land use maintenance measures such as; land use planning, open space preservation, tree planting and the creation of community gardens can be a cornerstone for sustainable development.

Key words: challenges, urbanization, sustainable, and management strategies, Bamenda.

RESUME

La plupart des villes d'Afrique sub-Saharienne, Bamenda inclusivement, sont aux prises avec les défis de l'urbanisation rapide et du développement urbain durable. Cela résulte principalement de politiques d'urbanisme inappropriées. Ces défis se manifestent par les établissements informels, la mauvaise utilisation des espaces publics, la mauvaise gestion des déchets, l'occupation de zones à risque, entre autres. C'est dans ce contexte sombre que cette étude vise à étudier les défis de l'urbanisation et les stratégies de gestion durable dans la ville de Bamenda. Ce travail visait à étudier pourquoi Bamenda est confronté à des défis d'urbanisation malgré l'existence de stratégies de gestion urbaine qui ont été mises en place. Trois hypothèses ont été formulées pour guider l'étude. Les méthodes et techniques de recherche qui ont été adoptées et utilisées ont conduit à la collecte, au traitement et à l'analyse des données. Des données secondaires ont été recueillies à partir de documents publiés et non publiés. Les données primaires ont été obtenues par le biais d'enquêtes sur le terrain où un total de 152 répondants de 9 trimestres sélectionnés de la municipalité de Bamenda ont fourni des réponses. De plus, des données primaires ont été obtenues, des interviews, des discussions de groupes de discussion et des observations, où les phénomènes observés ont été capturés à l'aide d'un appareil photo numérique. Les données obtenues à partir de questionnaires ont été traitées à l'aide de Microsoft Excel tandis que les images satellites ont été traitées à l'aide de Landsat (1973, 1988, 2003 et 2023). Des analyses inférentielles et non inférentielles ont été effectuées qui ouvrent la voie à l'essai d'hypothèses, à l'élaboration de conclusions significatives, de suggestions et à la mise en œuvre des politiques. Le résultat des données recueillies, traitées, analysées et interprétées a révélé qu'il y a eu une augmentation significative de la croissance démographique dans la municipalité de Bamenda de 1973 à 2023, soit 34000 habitants avec un taux de croissance de 9,68 % et 594000 habitants avec un taux de croissance de 3,66 % en 2023 (données démographiques historiques de Bamenda, 2023) qui n'ont pas été à la mesure des politiques d'urbanisme appropriées. L'étude a également révélé que certaines stratégies de défis urbains ont également été mises en place dans la zone d'étude, bien que seulement 53 % du répondant soient au courant des stratégies, 42 % de l'ignorance et 4 % du répondant ignorant l'ensemble. Dans l'évaluation des défis, on s'est rendu compte que l'implication directe de cela a été le règlement informel et l'utilisation abusive des espaces publics révélés par les études sur le terrain, 75 % des répondants approuvant que le règlement informel est à l'ordre du jour dans la ville de Bamenda. En outre, une mauvaise planification urbaine a entraîné une prolifération urbaine avec des impacts visibles qui ne sont même pas conscients de l'existence d'un plan directeur (68 %). Encore une fois, les défis de l'élimination des déchets ont été notés comme étant un défi urbain critique à Bamenda qui s'associe à des problèmes environnementaux (pollution de la terre, de l'eau et de l'air) car 39,47 % des répondants révèlent que les entreprises chargées de collecter les déchets viennent rarement les collecter. Il a été révélé qu'ils ne passent qu'une fois par semaine pour collecter les déchets, 21,71 % des répondants confirmant le fait. En outre, les parcs automobiles illégaux et les défis en matière d'insécurité (crise socio-politique, depuis 2016) ont été notés et confirmés par 88 % des répondants comme étant les défis à relever pour le développement urbain durable dans le domaine d'étude. Cette étude recommande donc, entre autres mesures, la mise en œuvre stricte des règlements de planification et l'élaboration d'une feuille de route qui résume les objectifs de développement durable de la ville. En outre, le recyclage des déchets, l'application des normes de contrôle de la pollution. En outre, les mesures d'entretien de l'utilisation des terres telles que la planification de l'utilisation des terres, la préservation des espaces ouverts, la plantation d'arbres et la création de jardins communautaires peuvent être une pierre angulaire du développement durable.

Mots clés : défis, urbanisation, durabilité et stratégies de gestion, Bamenda.

LIST OF ABBRIEVIATIONS AND ACRONYMS

BCC	:	Bamenda City Council
BUCREP		*Bureau Central de Recensement et d'etude de la Poulation du Cameroun*
CBD	:	Central Business District
CBO	:	Community Based Organization
CPT	:	Central Place Theory
FALSS	:	Faculty of Arts, Letters and Social Sciences
GIS	:	Geographic Information System
HILT	:	Human-Induced Land Transformation
ISG	:	Idea of Smart Growth
LULC	:	Land Use and Land Cover
MINDHU	:	Ministry of Housing and Urban Development
NIC	:	National Institute of Cartography
NLM	:	National Library of Medicine
UGB	:	Urban Growth Boundary
UN	:	United Nations
UNCED	:	United Nations Conference on Environment and Development
UNFPA	:	United Nations Population Fund
UN-HABITAT	:	United Nations Human Settlement Program
UPC	:	Union de Population du Cameroun
USA	:	United States of America
WCED	:	World Commission on Environment and Development

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CHAPTER 1

GENERAL INTRODUCTION

1.1. Background of the study

The UN Global Agenda for 2030, has called for urban sustainability by including goal 11 "inclusive, safe, resilient, and sustainable" cities. In 1976, the UN Conference on Human Settlements focused on the ramifications of rapid urbanization and its implications for the urban sustainable agenda and in 1992 following the Rio Summit, local governments accelerated the adoption of the adoption of agenda 21 to promote local sustainability planning. In the year 2012, the Rio+20 called for a local sustainability assessment (Maria, 2016). Despite such advocacy, evidence of the earth's deteriorating landscapes has continued to be on the rise. The unprecedented extinction of plant and animal species, poverty and decline in ecosystem services is evidence that the earth may not be able to sustain, the increasing human numbers and economic expansion while maintaining planetary stability Rockström *et al.,* 2009). Although researchers and city managers have often used the term sustainable city, there is no agreed universal definition of the term. Generally, researchers and practitioners go by the Brundlandt (1987) definition of sustainable development by also agreeing that a sustainable city should also meet the needs of the present city folks without sacrificing the ability of future generations of city folks to meet their own needs (World Commission on Environment and Development, 1987). A sustainable city is often described as a city which has the minimum environmental impact managed and inhabited by people dedicated to the minimization of required inputs of energy, water and food, waste output of heat, and minimal pollution.

In sub-Saharan Africa there are experiencing rapid urbanization with cities growing at an presidential rate while urbanization brings opportunities for economic growth and development. Sustainable development is a concept that aims to balance the economic, social and environmental aspects of human activities. It is especially important for developing countries like Cameroon, where rapid urbanization, population growth and poverty pose serious threats to the natural resources and the quality of life of the people. Bamenda is the capital of Northwest Region of Cameroon with population of about 594000 *Bamenda*, *Metro Area Population 1950-2023*. It is a vibrant and diverse city with a rich cultural heritage and a strong civil society. However, Bamenda also faces so many challenges such as waste management; climate change; water scarcity, energy insecurity and social inequality and the Anglophone crisis. These challenges affect the well-being of the people and the environment;

and require urgent and innovative solution the numerous services offered in Bamenda have somehow encourage rural exodus and accelerated the urbanization process of Bamenda people especially the youthful folks migrate into Bamenda in the search of jobs and scholarly pursue. This net flow of population within the recent past has not been compensated for by an increase of or improvement in social infrastructure. The crisis in Bamenda has made many people from rural area to flee their home and seek refuge in the city or in other parts of country. This has led to significant increase in the urban population, putting a strain on resources and infrastructure in Bamenda.

Human settlement condition in many parts of the world, particularly the developing countries, are deteriorating. Natural hazards now occur right at our door steps and the frequency of occurrence and magnitude of damages that they cause is seen to be on an increase especially in poor urban communities. The natural environment is deteriorating at a rate faster than the rate which natural occurring processes and resources available within the environment can replenish. If left unabated, landslides, floods, sporadic fire outbreak, collapse of major roads axis, houses and bridges have the potential of plunging urban centers in to an abyss of environment chaos. This explain the choice of Bamenda city Cameroon, a rapid expanding city in the third world as an example this study therefore assesses the overall situation of deteriorating urban quality Bamenda city is generally considered as hazard prone zone as it was notice that deteriorating urban quality stems from the phenomenon of rural exodus. This situation is further exacerbated by inappropriate systems of land administration, poverty and an overall anarchy and ignorance in the handing of environmental issues. This therefore calls for a multidisciplinary and hectic range approaches to solving present day environment hazard of Bamenda, It therefore calls for the adoption of modern technology and the systematization of the processes of land acquisition and registration. [*Yambol*]

1.2. Justification of the study

Sustainable urban development in most developing countries Cameroon inclusive, remains questionable as urban challenges continue to persist. The rate of urbanization in Cameroon is very rapid and averages about 6% per year [National Institute of Statistic] with very little follow up by town planners, which makes the situation very critical, which demands an attention (NIR 2002). More so, there still exist knowledge gaps on urban sustainability especially in the town of Bamenda. This partly explain the reason why this topic was chosen to explore these challenges and bring them to exposure to propose sustainable ways to manage these challenges. This study brings out sustainable measures to manage some of these urban

challenges such as; waste management, mobility challenges and sustainable housing. The study also brings out rich literature from other researchers to explore and continue to enrich knowledge in this related domain of study

The study also fills the knowledge gap in the area of urban development stakeholders such as the urban council, the Ministry of Housing and Urban Development and other related institutions involved in urban planning. Urban planning policies are also revisited in conjunction with fieldwork which brings to avenues for decision to better-up urbanization in the town of Bamenda. It is also important to note that this work will act as a document that can be consulted to take decisions in the town of Bamenda as far as urban planning and challenges are concerned. This is usually marked by a rapid increase in urban poverty and urbanization challenges. According to National Institute of Statistics (2017), 12.3 percent of the poor of Cameroon lives in urban areas, the Bamenda urban milieu has great difficulties to cope with the rapid urbanizations and face difficulties to create sufficient employment and the rapidly growing population which is estimated at 594000 inhabitants this explain why it was very important for a research topic of this nature to be exploited

1.3. DELIMITATION OF THE STUDY

This study is delimited into three parts, thematic temporal and location. All these parts are well explained to give an exposure to their contents.

1.3.1. Scope of the study

This study focuses on sustainable urban development in the town of Bamenda. The challenges to sustainable urban planning in Cameroon are well explained and rooted in other existing works. These challenges are designed in the study to cut across informal housing, informal transport sector, poor waste manage to poor urban planning policies. The study further handles urban problems and sustainable management strategies in the town of Bamenda. Some of these problems in this work include; population increase, inadequate urban infrastructure, limited housings infrastructure which has resulted to the proliferation, flooding occurrences, pollution, crime and insecurity, congestion and poverty. These will constitute the effects of poor urban planning which has led to the growth of poor quarters in the town of Bamneda. All these constitute the major themes exploited in this study.

1.3.2. Time frame

This study covers the period spanning from 1973 to 2023. This period marks the beginning of economic crises in Cameroon coupled with the Anglophones crises from 2016 still date within this time frame, the economic crises came about with the Structural Adjustment Program (SAP) that affected many sub-Saharan African countries where most development programs were halted. Cameroon was not exempted from the SAPs. By 2016, the Anglophone crises began and has a great impact on the urban development of the town as many urban infrastructures have been destroyed such as; roads, bridges, houses among others. It is also within this time farm that the program on the reconstruction of the town was launch. So, it was very important to work within this time frame to see how this the economic crisis and the Anglophone crises have affected the urban development of Bamenda. This period was equally chosen because the first population and housing census in Cameroon took place in 1976. This gave precise population data for Cameroon and Bamenda municipality in particular (2012 statistical year book for North West Region). This starting point, enable this study to evaluate the manifestation of urbanization challenges despite the existence of a master plan in Bamenda municipality since 1985.

1.4. Location of the study area

Bamenda is the capital of the North West Region of Cameroon.it is located between longitude 10° 09" and 10° 11" east of the Greenwich meridian and latitude 5° 56'0" and 5° 58" North of the equator (figure 1). It is found in the western highlands (Ndi et al.2017). The town experiences a humid and warm climate characterized by the rainy and dry season. The rainy season runs around mid-March to mid-November while the dry season runs around mid-November to mid-March. Average annual rainfall in Bamenda is 2247.60mm. The maximum temperature is about 25.7°c while the minimum temperature is about 23.0°c. The major type of wind in the area is the North East trade winds (Harmttan winds) responsible for the dry season and the south west monsoon responsible for the rainy season (Department of meteorology, North-west Regional Delegation of the Ministry of Transport, 2006).

Regions Of Cameroon

Mezam Division

Bamenda iii

Bamenda I ii iii Municipality
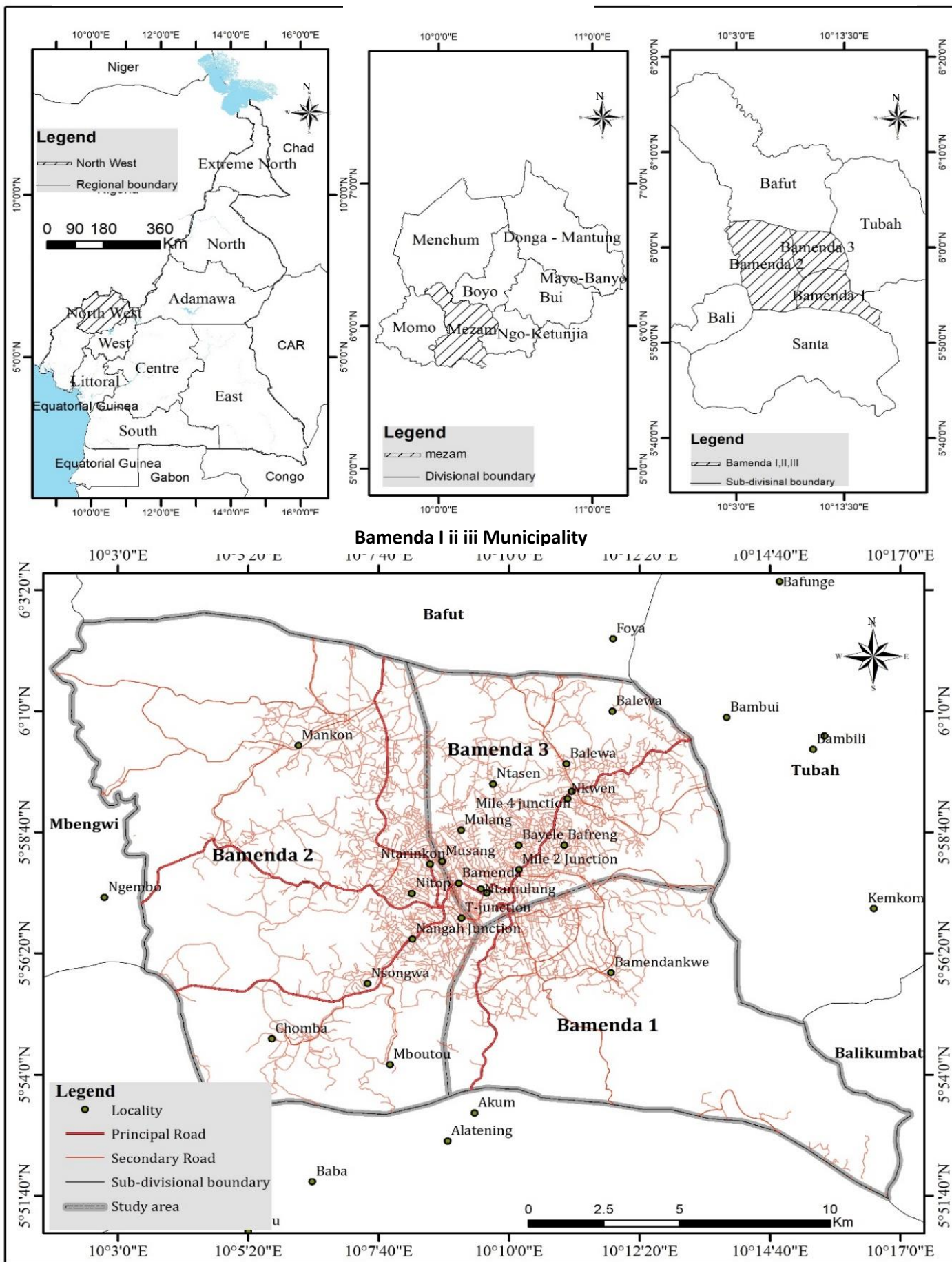
Source: National Institute of cartography-NIC, (2023)

Figure 1: Location of Bamenda.

The vegetation of the town is the Guinea Savanna vegetation (Neba, 1999). The town of Bamenda is bounded to the North by Bafut, East by Bambui, South by Santa and West by Mbengui and Bali. Bemenda is 374km and 316km from Yaoundé and Douala respectively (North West Regional Delegation of Transport, 2012). The local administration of the Bamenda is structured into Bamenda I, Bamenda II, and Bamenda III councils. Bamenda I is found on a high lava plateau (up station) with an altitude of about 1400m above sea level. Bamenda II and Bamenda III is found on a low plateau (Down town) with an altitude of about 1100m above sea level. These two plateau are separated by a broad escarpment (Ndi et al. 2017).

1.5. Statement of the research problem

Most metropolitan towns and cities in the sub-Sahara Africa, Bamenda inclusive are facing challenges of sustainable urban development. This mainly results from improper urban planning policies. These challenges are manifested by way of informal settlements, misuse of public spaces, poor waste handling and occupation of risk-prone areas (wetland and slopes). Bamenda, in the North West Region of Cameroon, is only one example of a town where socio-economic and environmental challenges have hindered sustainable development and enhanced the deterioration of urban centers through the anarchical occupation of fragile hill slopes sometimes leading to environmental risks. Population pressure resulting from rural-exodus of people seeking employment; entertainment, shopping, and a generally higher standard of living has resulted to pressure on resources in the town causing several problems. At the same time, social infrastructure and services are inadequate to meet the resulting increases in population and population densities. Urban population increase and pressure on road infrastructure inevitably cause traffic congestion around Mankon, food market and city chemist.

The town of Bamenda experiences rapid and uncontrolled urbanization which is a phenomena very common to most towns in Cameroon. Such leads to significant alteration of its ecosystems and loss urban greenery and habitat (Gairola et al, 2010) as well as habitat loss in myriad of environmental and socioeconomic challenges ranging from a reduction in green spaces to ecosystem deterioration, inadequate infrastructure, and some key urban challenges also relating to inadequate implementation of urban planning policies. These, among others are salient issues concerning urban challenges in the Bamenda Town. The pressure on the natural resources is increasing day-by-day as the town is expanding towards marginal lands due to rising population. It is thus important to understand the implications of such changes on the

natural environment in order to better manage resources through a sound sustainable management strategy.

A wide range of socio-economic challenges in the town of Bamenda acts like a stumbling block against sustainable urban planning. These challenges include; informal housing, waste management traffic jam, water supply, sanitation, waste management challenges and landslide This hinders sustainable development in the town of Bamenda, this has made it difficult for the inhabitants in the town of Bamenda to contain with these challenges which are glaring in the various quarters in town of Bamenda, this has also led to consequences like infrastructure deficiencies, healthcare , unemployment leading poverty educational consequence , this has hinder economic activities ,limit access to basic services , and affects the overall quality of life for residents .The urban environment is an important factor in determining the quality of life in urban areas, some urban environmental problems include inadequate water and sanitation, lack of rubbish disposal, and industrial pollution. Bamenda city has seen the progressive deterioration in its environment quality as a result of rapid and unplanned urbanization that took off since the 80s. There has thus been an upward surge in the frequency of occurrence of natural hazards within the environment which if left unabated have the potential of plunging Bamenda into an abyss of environmental chaos. landslide, flooding, sporadic fire outbreaks, collapse of major roads axis housing, pollution, high crime waves, congestion, are thus on an ever increasing high. [Acho Chi 1998]

The resultant effect of these challenges are many and have far reaching consequences both on individuals, town planning policies and urban development in general. Traffic jam is as a result of bad road which can lead to accident, waste management in this town also lead to pollution that is air land and water pollution etc. Environmental degradation and challenges are also very common in the town of Bamenda. Some of these visible environmental issues here include; flooding especially on slums, landslides-which are very common in the Bamenda up station and pollution this result from solid fuels for cooking and heating in households; as well as emissions from vehicles and industries contribute to air pollution in Bamenda which also leads to climate change. Thus, is a rising need for concrete environment management that can meet the taste of time in the short, medium and long term for present day Bamenda? At the same time the environmental implication of urban   development should be recognized and addressed an integrated fashion by all countries, with high priority being given to the need of the urban and rural poor, the unemployed and the growing.

As concerns sustainable management strategies, stakeholders such as; the Bamenda City council, the Regional Delegation for Urban Planning, related stakeholders and NGOs have not been very successful in fast-tracking sustainable urban development in Bamenda town. Most of their projects geared towards planning and the development of the town have not been fruitful since urban challenges continue to persist. Such as waste disposal ,high crime wave ,traffic jam and environmental challenges etc has disrupted economic activities in Bamenda and surrounding areas leading to a decline in productivity and investment businesses' have been force to close or operate at reduced capital resulting to joblessness and economic hardship ,infrastructure have be damage including hospital roads school leading to the displacement of population.

Overall the crisis in Bamenda has a detrimental impact on development in the region, affection various aspects of life and hindering progressing towards sustainable development goals. It is therefore imperative for the above stated problems to be diagnosed and addressed so that urban challenges can be adequately be attained

1.6. Research questions

1.6.1 Main research question

What are the challenges and consequences to sustainable urban development in the town of Bamenda?

1.6.2. Specific research questions

1) How does the urbanization process in Bamenda affect socio-economic life of the people in Bamenda?

2) What are the socio-economic challenges and consequences of sustainable urban development in Bamenda?

3) What is the effectiveness of the sustainable urban management strategies put in place in the town of Bamenda?

1.7. Research Objective

1.7.1 General Research Objective

To investigate challenges and challenges to sustainable urban management strategies in the town of Bamenda?

1.7.2 Specific Research Objective

1) To find out the trend in which rapid rate of urbanization in the town of Bamenda is a challenge to sustainable urban management.

2) To investigate the socio-economic challenges and consequences to the sustainable urban development in the town of Bamenda.

3) To evaluate the effectiveness of sustainable urban management strategies in town of Bamenda.

1.8. Research Hypotheses

The hypothesis stated here are in line with the above stated questions and objectives of the study. The hypothesis attempts an answer to the above mentioned questions of the study.

1.8.1 General research hypothesis

Sustainable urban management strategies in the town of Bamenda are poor and ineffective.

1.8.2. Specific research hypothesis

1) The rapid rate of urbanization in the town of Bamenda is affecting environment to sustainable urban development.

2) The uncontrolled urban growth in Bamenda is negatively affecting the sustainable urban development.

3) The poor implementation of urban development strategies in the town of Bamenda renders the sustainable urban development difficult.

1.9. Literature review

The highest illiteracy in the 21st century is to proceed with a research work without reading to uncover knowledge that has been written and stored by various authors in the related domain of research. It is in this light that, a wide range of texts, journals, conference papers, published and unpublished documents, reports, dissertations and PhD theses were consulted to build a rich and befitting literature to proceed with this study. This permitted the researcher to have some additional ideas on urban sustainability and its activities related to socio-economic development and equally to avoid the duplication of work that has already been carried out elsewhere. These documented works have divergent points of views concerning the topic which focuses on urban challenges and sustainable management strategies.

1.9.1 Socio-economic challenges to urbanization

Rapid and uncontrolled urbanization is archetypical of urban centers of the developing world. Such leads to significant alteration of its ecosystems and the loss of urban greenery and habitat (Gairola & Noresah, 2010) as well as habitat loss in the urban landscape (Mckinney, 2002). This has triggered a myriad of environmental challenges ranging from a reduction in green spaces to ecosystem deterioration. Bamenda, in the Northwest Region of Cameroon, is only one example of a city where socio-economic and environmental challenges have hindered sustainable development and enhanced ecosystem deterioration through the anarchical occupation of fragile hill slopes sometimes leading to environmental. People stream into Bamenda from other towns of Cameroon, rural areas and beyond to seek employment; entertainment, shopping, and a generally higher standard of living at the same time the environmental infrastructure of works and services is inadequate to serve the resulting increases in population and population densities. At the same time, social infrastructure and services are inadequate to meet the resulting increases in population and population densities. Urban population increase and pressure on road infrastructure inevitably cause traffic congestion.

The urban population growth of the district has been affected by agricultural industry. Better medical facilities and establishment of public facilities in cities pulled the rural population. Due to heavy migration city faces many problems. Heavy traffic flow has made the city highly congested. Many geographers have established various aspects of different cities in urban geography. In above present studies an attempt will be made to study the Nashik city in urban geography. The studies of demographic characteristic, occupational structure, study of different suburb growth and slums, problems and planning for future development, etc. Yaoundé agglomeration epitomizes is the rapidly expanding settlement at the pinnacle of the tropical evergreen forest of central Africa the repacaution of this rapid expansion has resulted in untold environmental stresses and other problems to cities duelers and managers this studies stood to convers the particular impact in the vegetation convers in a bit to contribute to solutions. That will enhance a sound of urban environmental system.

Fombe et al (2010) the problems of haphazard urban construction and the question of scattered settlement present a major challenge in most Cameroonian cities. This represents a series of urban governance challenge since in can impair the attainment of vision 2035 which aim at transforming Cameroon into an emerging economy.

According to Lucien Armel et al (2010) in the context of rapid and unplanned urbanization in many sub-Sahara Africa cities the social and political context of urban and peri urban vegetation production is becoming unfriendly despite its multifunctionality In achieving human development .this studies aims at measuring the effect of urbanization on urban resident perception of vegetation production in urban and peri-urban areas of Yaoundé (Cameroon) data from a survey conducted by the world vegetable center amongst urban duelers living around vegetable production shows that urban duelers agree with vegetable production in their vicinity but depending on the context of urbanization. The magnitude of their porosity perception varies significantly from one production era to another more specifically while approximating to the city center increases. The livelihood of urban resident ability to agree with local vegetable production. the density of the population decreases.

Emmanuel et al (2010) Human settlement conditions in many parts of the world, particularly the developing countries, are deteriorating. Natural hazard now occurs at their door step and the frequency of occurrences and magnitude of damages that they cause seems to be on an increase especially in poor urban communities. The natural environment is deteriorating at a rate faster than the rate at which natural occurring processes of resources available within the environment can replenish. If left unaided land slide flooding sporadic fire outbreak. Collapse of major road axis houses and bridges have the potential of plugging urban centers into and apes of environmental course. In the case of Bamenda city a rapid expanding city in the third world as an example. This study therefore assesses the overall situation of the deteriorating urban quality by randomly selecting some of the quarters within Bamenda city that are generally considered as hazard prone.

The pressure of numbers and the demand for living space result in environmental hazards and ecological degradation. Road infrastructures in several parts of the city have been subjected to rapid deterioration due to poor and ill-adapted techniques of construction. Settlement structures are haphazard and the pressures of numbers have pushed human settlements to hazard-prone zones and water catchment sites. Construction norms are in some situations simply ignored or highly disrespected and the regulatory mechanism is slow to act.

The sewer systems in some of the homes are not properly designed perhaps because of a lack of appropriate technology, the absence of well-trained and maintenance personnel and the high cost of the sewer systems. The sewage systems are insufficient and some lack satisfactory treatment and disposal. The use of septic tanks and waterless pit privies outside of core systems is a persistent polluter of groundwater supplies in various suburban areas. Solid

waste generation is on the rise perhaps due to rapid urbanisation, consumerism and industrialisation as the city continues to expand, the percentage of wastes such as; hazardous waste and derelict cars which requires special attention for collection and disposal. Environmental impacts of consumptive lifestyles include ozone layer depletion, acid rain, potential climate change and other forms of pollution and environmental degradation.

The ecological, social and economic challenges currently facing the development paradigm in Bamenda fits into this conceptual work. The city of Bamenda is faced with a plethora of challenges amongst which are environmental problems (pollution, microclimate, disease epidemics, diminishing green spaces, etc), social problems (over-crowding, lack of affordable housing leading to proliferation of slums and squatter settlements. This has resulted to the escalating of crimes and the lack of healthcare services. Economic issues such as; unemployment, slow operation of economic activities and poor markets are all liable "unsustainable cities (Berger, 2014). However, with proper planning, urbanisation presents many opportunities for sustainable governance, sustainable businesses/green businesses (in the private sector), and stakeholders' involvement (largely via NGOs) towards shaping the future of cities into settlements of sustainable development in terms of the three pillars of the economy, social and environment (World Commission on Environment and Development, 1987).

Ravi et al (2008) have studied trends and geographical patterns of urbanization in Arunachal Pradesh. They analyze the nature of. Population growth has major driving forces of land use change. For example, the crop area has shrunk by 1.60 sq km per year, fallow land 2.94 sq km per year, and wasteland 0.59 sq km per year in last 34 years, whereas built-up area has increased with the rate of 4.46 sq km per year or1.02 percent per year. Based on the use of multi resolution and multi temporal satellite data of 1975 to 2009, spatial and temporal changes in the various types of land uses and land cover of the city are detected and discussed.

Increase of population and economical activities have been followed by spatial expansion of urban area. Expansion brings a problem like scarcity of space, housing infrastructure, services and loss of agricultural land. Kumar, et al. (2007) have studied the spatial-temporal analysis to monitor urban growth. They aim to monitor the urban growth of Indore city. They employ remote sensing and GIS techniques and Shannon entropy. They decided city into four rectangular zones and calculated urban built-up area and its growth rate for different periods. The Shannon therapy proved good to determine the spatial concentration or dispersion of built-up area.

Zodage, et al. (2001) provided a detailed account of urban growth and its impact on environment in Kolhapur city. The geographical setting of the region, demographic characteristics i.e. decadal growth rate of population, density, sex ratio, ward wise population and occupational structure of city and locations, growth, population characteristics of different suburbs have been studied. He also studied different problems i.e. residence, transportation, water supply, health of the city. The demographic characteristic, location, distribution and occupational structure of slums of the city are also described. The city development and planning for future development have been studied and suggest various solutions. The Gibb's method is applied for the population growth rate and population projection. He also studied the suburbs and slum areas of the city by using the fieldwork method. Khadake, P. A. (2007) has provided detailed information in urban geography of Jalgaon city and Kumbhar, A. A. information about urban geography of Satara.

Ryngnga, P. K. et al (2009) have studied the existing road transport, change in structure of road and analyze how the change has affected the city and its population. With the help of topographical map, satellite survey, books, journals, they concluded that there is great diversity of roads in state highway, local streets. The density of roads has increased. Extension of road has followed irregular pattern. New road shows spread the urbanization in new areas and created various problems.

Singh et al (2008) deals with the urban ecosystem of Jalander city. Infrastructure with industrial and population growth. They studied development and expansion of the city. They assess industrialization and its interface with urban development concerning environmental degradation. Living condition of urban upper class people is good and lower class people in slum are miserable. Environmental degradation took place due to pollution, due to intense density of automobile and industrial noise and disposal of wastes and sewage water.

Fazel, Shahab (2009) has studied future residential demands, some urban fringe models. They investigated land use and land cover transformation in Saharanpur city and estimated present demand for residential land. The study was based on primary and secondary data source from survey of India maps. A land transformation model was developed estimating future demand. Study area was recorded a gradual increase in its population. The study shows that urbanization process has swallowed fertile land.

Fakhruddin et al (2009) they studied traffic problems in Jamshedpur town. It is the fastest growing town in Jharkhand. There is rapid growth of vehicular population. They identify the

main route of traffic congestion and factors behind this congestion. They observed traffic areas and data from district transport office. Traffic problem is prominent on Mango Bridge, purulia, dimna roads and Jugsalai railway route. Due to the absence of master plan, location of industrial and residential activities in different direction, poor traffic management, lack of diversification of roads and parking spaces, traffic problems have increased.

1.9.2 Related outcomes of urban challenges

Effective urban management is a condition for cities' sustainability. The policy framework for the sustainable development of urban areas requires multilevel cooperation among local, national and global communities and partnerships to mobilize public and private resources. Democratic legitimacy and stakeholder consultation are important. Sustainable development of urban areas requires integration and coordination, including regarding land-use issues, food security, employment creation, transportation infrastructure development, biodiversity conservation, water conservation, renewable energy sourcing, waste and recycling management, and the provision of education, health care and housing. Synergies can be identified, e.g., between waste and recycling management (environmental management) and access to water and sanitation (social development), between air quality conservation and green public transportation, and between production and distribution of renewable energy sources and green energy access, as well as between the goal of reducing inequities (effective urban governance) and access to education and health care (social development).In Bamenda this has led to overcrowding ;the flux of people from rural areas has increase the population of Bamenda city .This has put a strain on housing ,public services and infrastructure ,leading to inadequate living condition for many residents

The Survey proposes an integrated set of investments in infrastructure, public services and capacity development for different groups of countries. An integrated approach to rural and urban development is critical. Investment in economic and social infrastructure in rural areas might improve productivity, reduce poverty and inequity and create additional opportunities for sustainable livelihoods. Sustainable development of cities in poor countries entails investment in infrastructure such as roads, water, sewers, electricity and services such as schools, public transportation and health care. Leapfrogging investment in a green industrial transformation can generate youth employment. In cities of middle- and high-income countries, investment in infrastructure, renewable energy, buildings, and improved electricity and water efficiencies is important. Investment in the reduction of waste production and improvement of waste collection and recycling systems is needed in most cities across the world. Providing

access to modern energy services is a real challenge to urban authorities in developing countries which often do not have enough capacity to respond, nor the ability to raise the needed long-term financial resources for investment. In the town of Bamenda, investment in infrastructure have been very limited due to the socio-political crises that began since 2016 which has made investments very difficult in all domains.

Effective urban management is a condition for cities' sustainability The policy framework for the sustainable development of urban areas requires multilevel cooperation among local, national and global communities and partnerships to mobilize public and private resources. Democratic legitimacy and stakeholder consultation are important. Sustainable development of urban areas requires integration and coordination, including regarding land-use issues, food security, employment creation, transportation infrastructure development, biodiversity conservation, water conservation, renewable energy sourcing, waste and recycling management, and the provision of education, health care and housing. Synergies can be identified, e.g., between waste and recycling management (environmental management) and access to water and sanitation (social development), between air quality conservation and green public transportation, and between production and distribution of renewable energy sources and green energy access, as well as between the goal of reducing inequities (effective urban governance) and access to education and health care (social development). The Survey proposes an integrated set of investments in infrastructure, public services and capacity development for different groups of countries. An integrated approach to rural and urban development is critical.

Investment in Bamenda has not been impressive due to the political and social instability this has deter potential investors due to insecurity. The economic and social infrastructure in rural areas might improve productivity, reduce poverty and inequity and create additional opportunities for sustainable livelihoods. Sustainable development of cities in poor countries entails investment in infrastructure such as roads, water, sewers, electricity and services such as schools, public transportation and health care. Leapfrogging investment in a green industrial transformation can generate youth employment. In cities of middle- and high-income countries, investment in infrastructure, renewable energy, buildings, and improved electricity and water efficiencies is important. Investment in the reduction of waste production and improvement of waste collection and recycling systems is needed in most cities across the world. Providing access to modern energy services is a real challenge to urban authorities in developing countries which often do not have enough capacity to respond, nor the ability to

raise the needed long-term financial resources for investment. Overview xi A "one size fits all" approach towards sustainable development in cities is precluded, since cities' priorities, objectives and paths are highly diverse. Policy frameworks need to promote a common integrated approach, while differentiating among the responsibilities of upper-, middle- and low-income countries. Consequently, measures of sustainable development progress also need to be tailored to the particular challenges and opportunities identified and prioritized by the cities' main stakeholders. Ensuring food and nutrition security. It is essential to ensure that everyone in the world has access to enough nutritious food.

1.9.3   Sustainable management strategies

Also, operating within the concept of "Smart Cities" sustainable urban development can be effectively implemented by integrating the physical, digital and human systems in the build-up environment to deliver sustainable, prosperous and inclusive environmental management in all spheres. The concept of "Smart Cities" is developed based on digitalising urban structures including infrastructures of all sorts for inclusive and integrated urban components for the sustainability and development of our cities (Filipe and Joao, 2019). Bakici et al. (2013) defined "Smart Cities" as the high-tech intensive and advanced city that connects people, information, and city elements using new technologies to create a sustainable, greener city competitive and innovative commerce, and increase life quality.

Two years after, Marsal-Llacuna *et al.,* (2015) further underscored that "Smart Cities" initiatives try to improve urban performance by using data, information, and information technologies (IT) to provide more efficient services to citizens, monitor and optimize existing infrastructure, to increase collaboration among different economic actors and to encourage innovative business models in both the public and private sectors. It is, therefore, important to circumscribe such a valuable study on urban challenges in the conceptual framework of sustainable development and "Smart Cities". This discourse on the conceptual framework clarifies the problem and the raison d'etre of this study. It also gives an aperture for data analysis and discussions.

Important approaches, thematic areas and challenges in which big efforts are being made in Europe are among others smart cities and communities, climate change and the integration of refugees and migrants. Smart Cities and Communities refer to urban areas which make increasing use of ICT and in which (social) innovation plays a significant role. In this concept, ICT can be a main enabler for tackling societal challenges and to enhance the

participation of society in urban development processed. Technological approaches which take particular respect to and include social processes, in short the link between innovation and society, makes Smart Cities and Communities an important concept for urbanization. Furthermore, in European cities great efforts for reducing greenhouse gas emissions, including increasing the energy efficiency of the existing building stock, have been made. Strategies and approaches to mitigate climate change are a common feature.

Block-wise study was undertaken. They consider 9 towns. The density gradient was also observed. Khan Sayeed Ahmad (2009) studied urban growth in India and future prospects. They study the growth rates of urban population and net decadal growth of urban population. They projected the probability of future trend and explore the nature of these trends. In corporate quantitative approach method was adopted. They also got data from India Infrastructural Report and Planning Commission of India. The study has shown that the urban growth has declined but urban population has increased. It will affect urban infrastructure and environment.

Ravi et al (2008) have studied trends and geographical patterns of urbanization in Arunachal Pradesh. They analyze the nature of. Population growth has major driving forces of land use change. For example, the crop area has shrunk by 1.60 sq km per year, fallow land 2.94 sq km per year, and wasteland 0.59 sq km per year in last 34 years, whereas built-up area has increased with the rate of 4.46 sq km per year or1.02 percent per year. Based on the use of multi resolution and multi temporal satellite data of 1975 to 2009, spatial and temporal changes in the various types of land uses and land cover of the city are detected and discussed.

People centered urban planning and the renewal of the existing housing stock towards energy efficiency and for enhancing the quality of life of the residents are key to sustainable urban development. To this end, the example of the project Sub-urban showcases how co-design in urban living labs and participatory planning can modernize and socially uplift underprivileged neighborhoods. In Chinese cities, the development of superblocks has hindered the walkability in urban areas and contributed to urban sprawl. The large-scale renewal project in Nanchong Prefecture (Sichuan Province) illustrates how urban planning and renewal can contribute to the human scale developments by promoting a multi-centric urban structure and thus enhance walkability, access to public parks and thus contribute to sustainable and livable urban areas.

1.10.   CONCEPTUAL AND THEORETICAL FRAMEWORK OF THE STUDY

A number of theories and concepts have been used in this study to show its importance and significance in order to inscribe the work into a scientific background. In a whole, two concepts and theories are being used. This section first of all begins with the conceptual background and then, theoretical considerations.

1.10.1. Conceptual framework of the study

This write up is geared toward sustainable urban development, challenges consequences, and possible solution to solve these problems in the town of Bamenda. Some concepts were identified and defined to guide the understanding of this research, this concepts such as the concept of urbanization and urban challenges, migration which are not directly linked to the topic has been identified and used to facilitate the understanding of the work. The definition adopted are conceptual and theatrical. The intention is to articulate these terms around the context and background of the research questions vis a vis the perception of the population of Bamenda.

1.10.2. Urban Challenges

"The Urban Challenge" was a chapter in the 1987 Brundtland report, *our common future.* The issues remain depressingly familiar for Rio+20. Urbanization has continued around the world, sometimes diminishing rather than enhancing social and environmental capital. According to geographers, urban challenges include, affordable housing, urban pollution and inequalities in access to services and amenities. Urban challenge are problems faced by all growing urban areas. This is particularly in developing countries with higher formation of informal or squatter settlements.

According to climate-Kic (2017), urban challenges are problems faced in the urban areas such as inadequate infrastructure, buildings, energy supply, water systems and drainage, sanitation, waste management, housing and mobility. Figure 2 shows the conceptualization of urban challenges with three main dimensions which are; environmental, socioeconomic, institution and policy framework.
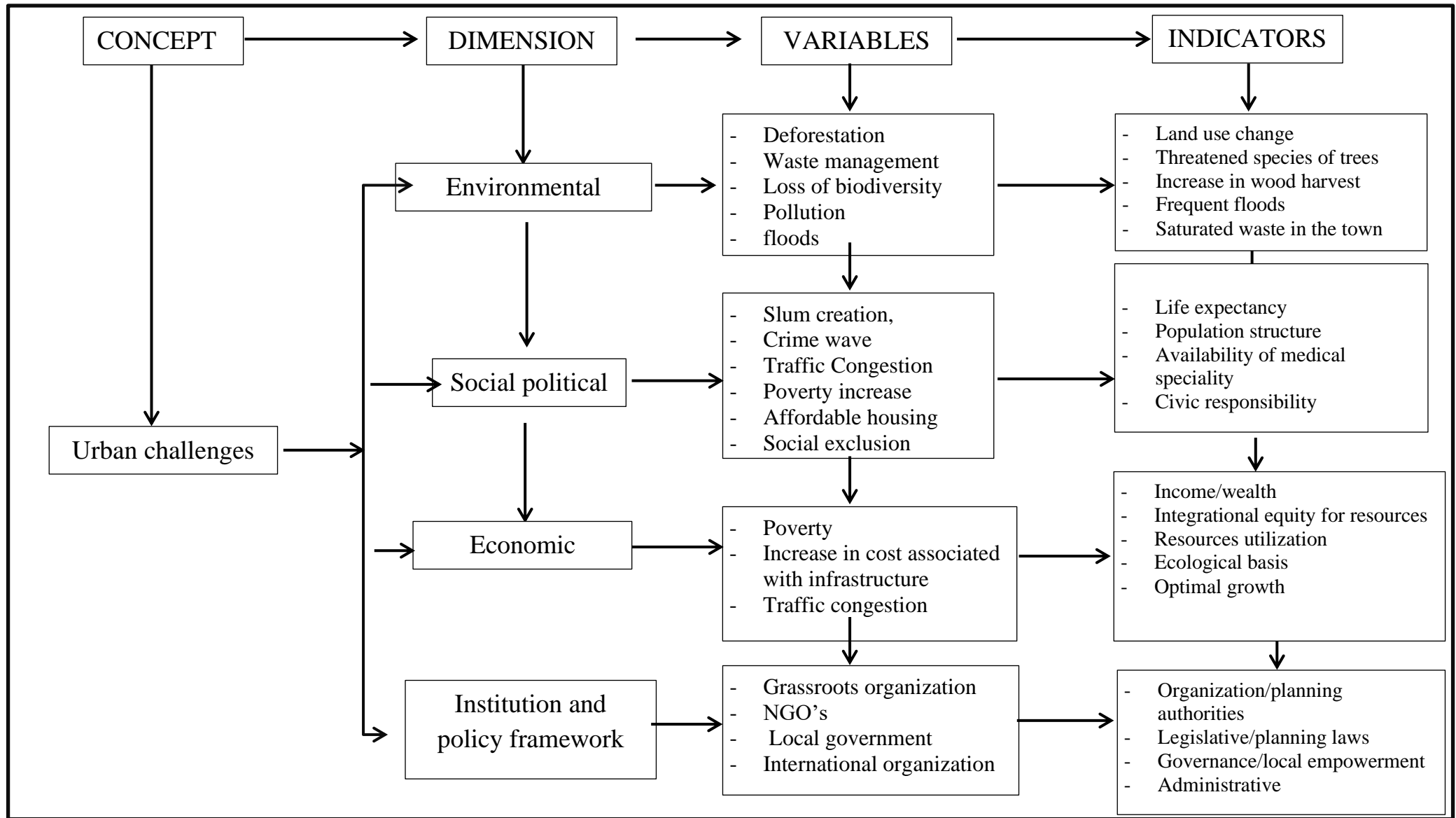
Source: Author's conception, inspired by a master's II classes

Figure 2: The conceptualization of urban challenges

1.10.3. Urbanization

Urbanization is the process by which rural communities grow to form cities, or urban centers, and by extension, the growth and expansion of those cities. According to Karl Marx, urbanization is the natural outcome of the development of the productive forces as well as the launch pad for sustaining that development. Urbanization can also be referred to as the population shift from rural to urban areas, the gradual increase in the proportion of people living in the urban areas, and the ways in which each society adapts to the change. The process whereby a society changes from a rural to an urban way of life (NLM, 2014). According to Cerda, urbanization is the set of principles, doctrines and rules that should be applied so that buildings and their conglomerations, as opposed to constricting, distorting and corrupting the physical, moral and intellectual faculties of social humans, can help promote their development. Urban Sociologists look at Urbanization as the study of the social, political and economic relationship in cities

Urban Geography is a new branch of geography which developed in 20th century for the first time, Mr Karl Massert had given the outline of urban Geography in 1907. Urban geographers look as Urbanization as the movement of the population from rural areas to urban areas. It is essentially the gradually increase in the proportion of people living in urban areas. Geography being the study of physical features of the earth and atmosphere. The term urbanization is complex and to study it under geography, we need to know how the process of urbanization affects the physical environment. With an influx of people moving from smaller towns and large cities, making a transition to becoming more industrialized and making room for an increased volume of people and businesses in the city center. Thus, the landscape's physicality is changed in order to accommodate an increased population. This expansion often results in the process known as deforestation, essentially cutting down of trees and other physical features, clearing land to give way to human settlements, land degradation, and climate change, pollution and some natural disasters are aspects very common in the town of Bamenda especially in most accidental areas like the Up-Station.

The study investigates challenges of urbanization and sustainable management strategies put in place in relation to these challenges in Bamenda by the administrative authorities. Urbanization is conceptualized in figure 3. Three major dimensions are given a close look notably vertical growth and horizontal growth of the causing the above mentioned urban challenges.
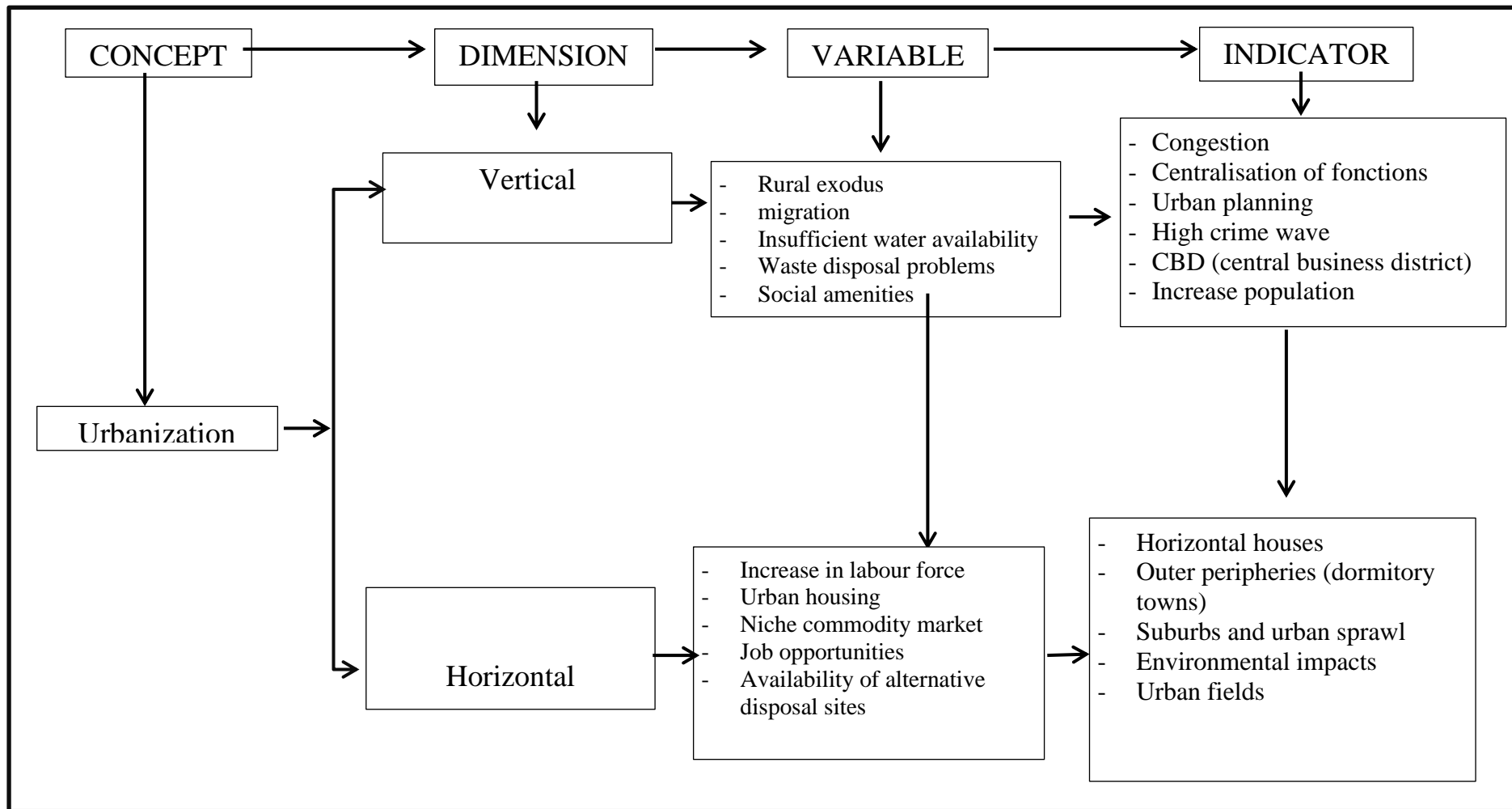
Source: Author's conception, inspired by a master's II classes

Figure 3: The conceptualization of urbanization

1.10.4. Sustainable urban management

Sustainable urban management has been defined in various ways with different criteria and emphasis. But its goal is to promote and enable the long-term wellbeing of people and the planet, through efficient use of natural resources and production of waste within a town while simultaneously improving it.

To better apprehend what is mean by sustainable urban management, it is important to first understand what sustainability, sustainable living and management is all about. Sustainability is understood as maintaining the demands of the current population without compromising on the demands of future population while sustainable living is meeting our needs in a way that people in the future can also meet their needs. This huge goal requires attention at the environmental, societal and economic levels.

Management can be defined as achieving the desired goals in an efficient and effective manner through planning, organizing, leading and controlling resources (Davidson, 1997).

According to Davey, sustainable urban management is related to the programs, plans, practices and policies that ensures that the growth of population correspond to access to basic needs such as shelter, employment and infrastructure. Though, such access depends, on private initiatives and enterprise, it is critically affected by public sector policies and functions that only government can perform.

Meine (2006), offers a relatively broad definition. He defines sustainable urban management as an effort to coordinate and integrate public as well as private actions to tackle the major issues the inhabitants of the cities are facing, to make a more complete, equitable and sustainable city.

According to Van et al (2006; p56), sustainable urban management is the coordinated development and execution of comprehensive strategies with the participation and involvement of all relevant urban actors , in order to identify, create and exploit potential for the sustainable development of the city.

From the report of the Cairo conference on general authority for urban planning (2001), sustainable urban Management is a set of public policies that are developed and applied at the local or regional level, and that address a wide range of issues (land use, transportation, housing, development or gentrification, environmental protection and waste management) (figure 4).
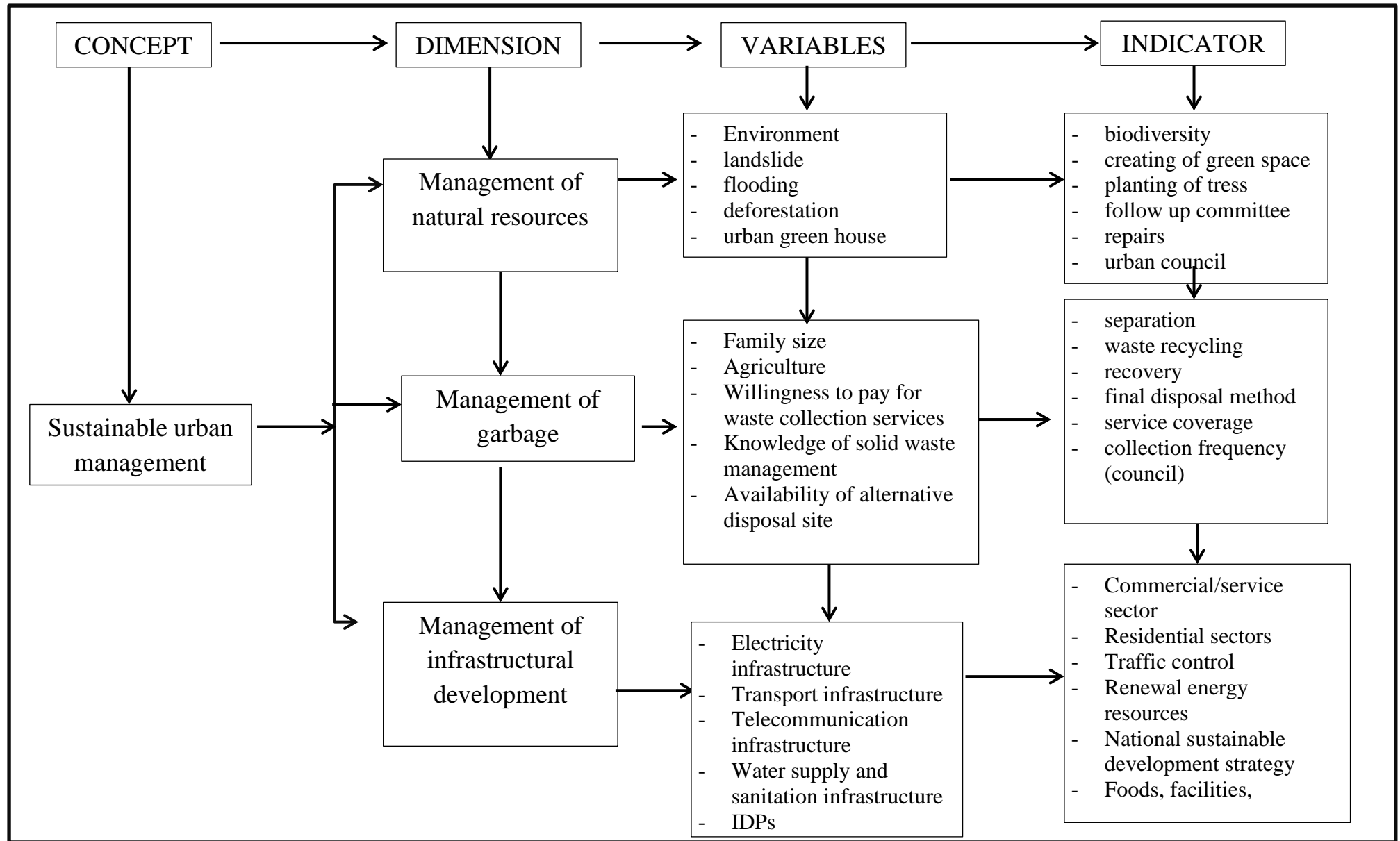
Source: Author's conception, inspired by a master's II classes

Figure 4: The conceptualization of sustainable urban management

1.11. Theoretical Framework

A number of theories have been used in this study base on their relevance to this research topic; Challenges of urbanization and sustainable management strategies in Bamenda municipality.

1.11.1. Human-Induced Land Transformation (HILT) Theory

The HILT model was originally developed by Clark et al, (1997). Theory was first used to explain regional urbanization patterns in the San Francisco Bay area. It has however, been applied in different urban areas like Washington DC and New Mexico. This model seeks to explain a one-way transition from a non-urban category to an urban category. This involve;

- converting space into a grid

- Establishing an initial set of conditions

- Establishing a set of transition rules that are applied for each interaction

- Recursively applying the rules.

Base on the above criteria, four different types of urban growth are distinguished in the HILT model. They are: spontaneous, Diffusive, Organic and Road influenced urban growth. For the spontaneous neighborhood growth, randomly the cell may become a new urban center simulating the development of urban settlements in an undeveloped area. This growth type indicates the number of new centers that will be created subsequently. For diffusive growth, a spontaneous urbanized cell may subsequently develop into a spreading urban center even though it may not lie near an already existing urban center.

For organic growth, a random cell may become urbanized if some of a neighboring cell is already urbanized (expansion of existing urban area). For road influence growth, urbanization may expand along road network simulating development in newly accessible areas. The urban growth rules in HILT involves selecting a location, investigating the spatial properties of the neighboring cells and urbanizing the cell under consideration base on a set of weighted probabilities. There are five factors that control the behaviors of the system:

- A diffusion coefficient that determines the overall depression of the distribution both of single grid cells and in the movement of settlement outward through the road system.

- A breed coefficient that determines how likely a newly generated detached settlement is to begin its own growth cycle

- A spread coefficient that controls how much normal outward "organic "expansion takes place within the system.

- A slope resistant factor that influences the likelihood of settlement extending up steeper slopes

- A road gravity factor that has the effect of attracting new settlement into the existing road system if they fall within distance of a road (Clark et al, 1997)

In the HILT model, four major types of data are used. They include;

- land use data

- slope

- Transportation

- protected lands

Land use data and protected lands are used to determine the initial cell values at the start of the simulation. The slope associated with each grid cells is used to determine the likelihood of urban growth development along hillsides and the road information is used to influence the urbanization along transportation corridors

This theory is not without criticism especially when compared with what obtains in Bamenda municipality. The model was originally based on a study in San Francisco, a town in the developed world as compared to Bamenda which is in the less developed world. The patterns of growth proposed by this model are different from those taking place in Bamenda municipality like development induced by a road network. In Bamenda, infrastructure only comes after population growth has taken place. This is different from what obtains in the developed world. The rapid urban growth witnessed in Bamenda municipality also makes it difficult to fully apply the model as it uses self-modifying rules to prevent such behaviors which are too slow to adequately stimulate the population. The model equally fails to provide adequate procedures that can be used to predict future population growth trends within an urban area. This makes planning insufficient to ensure a sustainable urbanization since future population growth trends cannot be fully predicted

Despite the above criticisms, the model serves as a basis to fully comprehend the problem of rapid population growth leading to urban challenges in Bamenda municipality and the sustainable management strategies that can be put in place to solve this problem. The different types of growth proposed by the model are visible in Bamenda. The spontaneous growth is

seen in the population growth in risky area such as Mile 4, Mulang, and Cow Street which were initially less inhibited. The road influenced growth can be seen with the expansion of the town towards Bambui-Bambili, Bali and Bafut as a result of development of road network in those areas.

The different types of data used in the HILT model also make the model highly applicable in Bamenda. Land use data and protected land data all exist in Bamenda municipality and can be seen as initial cells at the start of the simulation as proposed by the model. The slope data associated with each grid cell used to determine the likelihood of urban growth development along hillsides is also highly visible in the town with urban expansion toward hillside such as sisia and Abangoh. Road information is also used to influence urbanization along transportation corridors like expansion of town towards Bafut, Bali, and Bambui in the study area as proposed in the theory.

Thus, the theory sets a basis to better understand the phenomenon of urban challenges in the town which can be curbed by implementing effective management strategies to ensure a sustainable urbanization.

1.11.2. Inner city decay

Generally, population and activities have long been associated with the central part of city. This pattern with its special structure has exemplified itself in specific functional patterns followed by accommodation of mix urban land uses. Residences could recreate as well as having civilized interaction. It is been argued that the historical trend pertaining moving away or abandoning inner city activities toward periphery followed by formation of sprawl development as well as changes in the central city land uses have great impact upon areas status deterioration and decay. According to report by the popular media the racial desegregation of apartment building s in Johannesburg's inner city decay was accompany by a general decline in living standard. Press reports in late 1980s and early 1990s testified to the breakdown of the relationship between landlord and tenants. Inner city decay in Bamenda Cameroon, is a Signiant's issues that present various challenges for city and its residents. some of the factors contributing to inner city in Bamenda include

Infrastructure deficiencies and urbanization pressure; the deterioration state of infrastructure, including roads building and public facilities, can contribute to inner city decay livability of urban and hinder economic development. Rapid urbanization in Bamenda has also

led to unplanned and informal settlement, overcrowding, and inadequate housing conditions. This can strain the city resources and decay in certain area like small Mankon and Azeri.

1.11.3. The Idea of Smart Growth (ISG)

The idea of smart growth was used to describe the response of uncontrolled urban expansion in America. (Reis, 2002). A look at the population census and other market trends showed that the decentralization of economic and residential life remains the dominant growth pattern in the United States (U.S.) (Katz, 2002). Taking into consideration the seriousness of this situation, the ISG was developed to suggest alternative solutions to the problem of rapid growth as it propose the application of sustainable development concept to land-use issues. The idea channeled development to areas of existing infrastructure that consumed less land for roads, houses and commercial buildings. This idea thus means smart management of resources in both growing and declining communities. The ultimate goal of smart growth was to counteract urban challenges which is not different from general solutions forwarded by planners such as;

- limiting outward expansion

- Encouraging higher density development

- Encouraging mixed-use zoning

- Reducing travel by private vehicles

- Revitalizing older areas

- Preserving open space

More modern smart principles required the need to address housing opportunities for middle class and low-income families in the cities and close-in suburbs while creating more affordable housing near job centers. One of the main ideas behind this initiative was that 'the denser the better'. American planners, organizations and groups claim that there could control urban challenge in some states and proved that smart growth is working after ensuring that local governments comply with these ideas and policies. For example, the Oregon state in the west of the country started taking anti-urban challenges measures 30years ago. Base on a Law passed in 1973, each of Oregon's 240 cities is surrounded by an urban Growth Boundary (UGB) which shows where a city is expected to grow and end. Urban services and infrastructure such as sewers were not to be extended beyond the UGB. The growth boundary could only be modified if the city complied with state-wide planning goals and standards.

Another place where the ISG is well known for its implementation was Los Angeles. The idea of smart Growth has been extended on other states of USA and in other countries. It success in other areas ultimately depend on its adaptation to the unique political, cultures, market realities and developmental trends in that area. It should be noted that the ISG can be an effective anti-urban challenge measure in only one-way which is confining more and more people into existing urbanized areas.

The ISG has some limitations. It can be criticized base on the fact that it lays more emphasis on confining more and more people within the existing urban area to solve the problem of urban challenges out of the urban area while neglecting urban challenges that occur within the urban area. For example, it does not take into consideration the haphazard, disorganized and poor occupation of urban space such as marshy and risky zones within the urban centers. Taking the case of Bamenda municipality, urban challenge is not only felt with the expansion of the town into the periphery but also with the expansion of the town into marshy and risky zones such as Mulang, Ngomgham and Cow Street which falls within the urban space. This aspect has been completely neglected by the ISG limiting it applicability in the town of Bamenda.

The ISG can equally be criticized base on the fact that it considers that "the denser the better" without taking into consideration the impact of high population densities. The impact of denser urban areas like high unemployment, high crime wave, limited social facilities, high congestion and pollution which are highly associated with dense urban areas has been highly neglected by the model

However, the ISG set a relevant base in solving the problem of urban challenges in many urban areas especially when fully implemented. Taking the case of Bamenda municipality, one can discover that the extension of the ISG into the town by creating an UGB and ensuring it implementation will help solve the problem of urban challenges into it surrounding peripheries and risky environment. This is because confining urban growth within the UGB will help limit outward expansion of the town into the countryside and into the marshy and hilly areas. This is possible with the fact that, the land tenure system is very evident in Bamenda with some families owning large expanses of land within the town and not willing to give it for urban land uses. There exist available lands within the town in which the urban population can be confined apart from the risky zones.

In addition, by implementing the mixed-use zoning system and by reducing travel of private vehicles within the town will ensure the judicious use of urban resources and limit traffic congestion within the town. Thus, the implementation of the ISG in Bamenda town will greatly help in solving the problem of urban challenges as well as ensuring it sustainable growth.

1.13.4. Central Places Theory by Walter Christeller (1933)

The German geographer Walter Christaller introduced central place theory in his book entitled "Central places in southern Germany "(1933). The primary purpose of a settlement or market town, according to central place theory, is the provision of goods and services for the surrounding market area. Such towns are centrally located and may be called central places. Settlements that provide more goods and services than other places are called higher-order central places. Lower-order central places have small market areas and provide goods and services that are purchased more frequently than higher-order goods and services. Higher-order places are more widely distributed and fewer in number than lower-order places

According to Margot Smith, Walter Christaller erred in his development of CPT in 1930 by using size of population and number of telephones in determining the importance of a city, the number of kinds of services offered there was more important as a measure of the importance of a city in attracting consumers. In applying CPT to describe the delivery of medical care in California, smith counted the number of physician specialties to determine the importance of a city in the delivery of medical care.

The CPT has some criticisms or limitation. It can be criticized based on the fact that consumers and sellers are not always rational. Consumers take decisions on social networks and personal biases. For instance, Bamenda being the major town of the North West region, many persons travel from far neighboring towns to buy in Bamenda by passing other towns in the region. This model equally fails in terms of distance as distance in itself doesn't determine consumer purchasing power as good transport networks facilitate movement of customer from one place to another. The construction of roads linking Bamenda to other towns in the region has facilitated movement of goods and people within the region. The construction of the Bamenda-Nkambe Road have facilitated urbanization process in the study area as people now travel without any road obstacle to Bamenda as it the center of attraction in the North West Region despite the fact that other towns also exist In the region. This makes sustainable management difficult since future population trends cannot be predicted.

Also, the idea of higher-order and lower-order central places has made the collection of waste in the study area difficult. The town is saturated with liquid, biodegradable and non-biodegradable waste. Plastics waste are found all over the town because of the existence of so many market in the town. The existence of just one or two market in the town could have facilitated the collection of garbage by the companies involved.

Within the context of the town of Bamenda, this theory is used to explain urban challenges especially those linked to sustainable urban management which are found within the heart of the town just as this theory suggests. The theory is relevant in the town of Bamenda also in that the central part of the town faces most of these challenges which are almost leading to urban decay process of the town. As earlier mentioned, these challenges range from socio-economic, political, social and even environmental dominating at the heart of the town. This explains why this theory was used to partly explain this study. This shows that if resources are equally distributed within the region and higher institutions are equally allocated in all divisional capitals, people will no longer see the need to migrate to Bamenda for one reason or the other.

With development of model communication and information, the consumers are able to make rational choices. For instance, people in Nkambe can compare the prices of goods on online shopping platforms to see which prices differ in the different market. If the prices in Bamenda are the same with that of Bui Division then the consumer will have no reason traveling all the way to Bamenda.

Thus, the model set a basis for the better understanding of the phenomenon of general laws of interaction of people with towns of different sizes in an ideal geographical situation which can help in setting out good management strategies to ensure sustainable urbanization.

1.12. Methodology of the study

Research methodology involves all the steps taken in data collection, treatment and presentation. The methodology that is used in this work include hypothetic-deductive approach with hypotheses as the point of departure which were subjected to verification. This methodology was structured in three phase that is, data collection, data analysed and presentation was aimed at meeting the objectives and hypotheses of the research. Several methods were used to acquire secondary and primary data. A good number of libraries and some archives were consulted to collect secondary information on urbanization challenges which included; libraries of the university of Yaoundé 1, the archives of the Bamenda City Council and internet websites. The BUCREP office, Ministry of Housing and Urban

Development in Bamenda and other related offices and institutions were used to gather more secondary information on urbanization challenges. This gave way for field work to carefully identify and observe the environmental and socioeconomic problems brought by high rate of urbanization in the town of Bamenda. Here, quarter heads, some selected households, stakeholders in the sector, Information collected was either through field observation, administration of questionnaires and granting of interviews.

1.12.1. Secondary Data

The data that were gotten here were largely qualitative data and was gotten mostly through perusing of documents. This involved the consultation and systematic exploration of textbooks, dissertations, research reports, periodical journals, and conference papers, published and unpublished documents on urbanizations challenges and related websites on urbanization problems. Internet materials were downloaded in a flash disk and further exploited. These documents were exploited by analyzing the ideas of different authors and research works on the topic and also making some adjustments and amendments. These consultations were realized from libraries, research institutions and internet exploration. The libraries of the University of Yaoundé 1 were used especially those of the Faculty of Arts, Letters and Social Sciences (FALSS) and departmental library. The purpose was to find out what has already been done in the domain of Urbanization in relation to Challenges and sustainable management strategies to adjust and equally gather more facts in the domain of the research topic. Bamenda City Council plan was consulted to obtain statistics on the evolution of urbanization in Bamenda. The *BUCREP* National Office for Census and population study *office* was visited to obtain demographic data of the population of the study area that was used to design the sample size of the population. All these were done to get information on the challenges of urbanization and sustainable management strategies put in place in the study area.

1.12.2. Primary Data

This involved data secured through field work which was largely constituted of quantitative data. Related offices and resource persons were equally contacted. From these visits, information was collected by direct field observations, administration of questionnaires and granting of interviews to the stakeholders. Focus group discussions were also organized to obtain information on sustainable urban challenges faced by the people of Bamenda and coping strategies in view of these challenges. In this light, field trips were organized where the first trip was for the familiarization with the field and commencement of data collection.

Observation was made and photos taken which help the researcher to do a comparative view between secondary and primary data. The second continued with data collection which took quiet long because of the socio-political crisis in the region. Interviews were administered to government agents like the Mayors of the three municipalities in the town of Bamenda and the Divisional Delegate of the Ministry of Housing and Urban Development (MINDHU), head of the council development plan in Bamenda II municipality. Data on urban development policies, challenges and implications of the socio-political crises were gotten from these authorities. These Government agents provided information on the role they play on urban management and the challenges they are facing in implementing the sustainable strategies. This data played a great role in the attainment of the objective of the study.

1.12.3. Direct Field Observation

With regards to field observation, areas with high urban challenges were selected for observation like Bamenda-Nkwe, Sisia I and II, Mulang and Mbefi. These urban problems identify were; overcrowding, inner city decay, floods, bad roads, landslide, housing shortages, traffic congestions and poor waste management. Field observation was organized in one phase which span through the rainy season in other to better understand the nature of the roads, floods and landslide especially in the Sisia and the swampy areas of Mulang.

During field work, measure practiced by residents of Bamenda was equally observed especially where there is high intensity of rain and how people living around dustbins areas behave toward overstayed waste.

The following stages were involved in the collection of field data.

Stage 1: Reconnaissance Survey (Meeting with administrators and creation of contacts)

The researcher visited the various administrative centers and created contact with them in order to obtain appointment for interview. The administrators visited included; the Government Delegate to the Bamenda City Council, the Regional Delegate of the Ministry of Housing and Urban Development and the Mayor of Bamenda I,II and III municipalities, The quarter head of Sisia. During these visits, permission was obtained from the Bamenda City Council (BCC) and from the quarter head of Sisia to permit the researcher carry out his research. Documents carrying information on secondary data concerning the Master Plan of Bamenda was obtained during the first visit to the Ministry and the document having information on council Development Plan for Bamenda III Council.

Stage 2: Pre-testing of Questionnaires

This stage involved the pre-testing of the questionnaires to ensure their credibility. Ten questionnaires were administered in Mulang and Mbefi which aimed at seeing if the questionnaires will produce the required information and also to make sure that the question were properly understood by the respondents.

Stage 3: Administration of Interviews

Interviews targeted resource persons and related officials that could give an insight of urban problems and measures put in place to solve these problems. With the help of the question guide, question were ask to the personnel in charge of Housing and Urban Development at the Bamenda City Council (BCC) on behalf of the Government Delegate of the BCC and Mezam, Divisional Delegate of the ministry of Housing and Urban Development, head of development plan for Bamenda II and III Councils. During these interviews, the research was intended to get information on urban planning strategies put in place by the administration and the level of awareness and implementation of master plan. The responses of this interviews were recorded in a mobile phone.

1.13. The Population of the Study.

The population of the study area compose of 9 quarters found in the Bamenda municipality. These quarters include; Mulang, Ntamulung, Abangoh Ntangang, Lower Ngomgham, Sisia 1, Sisia 2, Mbefi, Mbesoh, Bamenda-Nkwe. These 9 quarters regroup a total population of 59161 inhabitants and 10517 households (BUCREP, 2010 population and housing census). The 9 quarters make up the study area which came from the three municipality that is Bamenda I, II and III. (Figure 5 and 6). These quarters were group in order to reduce the complicity of tables to be used in this work. Two were selected from Bamenda I which gives a total population of 11918 inhabitants, three quarters from Bamenda II giving a total population of 33328 inhabitants and five quarter from Bamenda III with a total population of 13915 inhabitants. Figure 5 below presents the different selected quarters found in Bamenda town arranged in according to municipalities in order to facilitate the study.
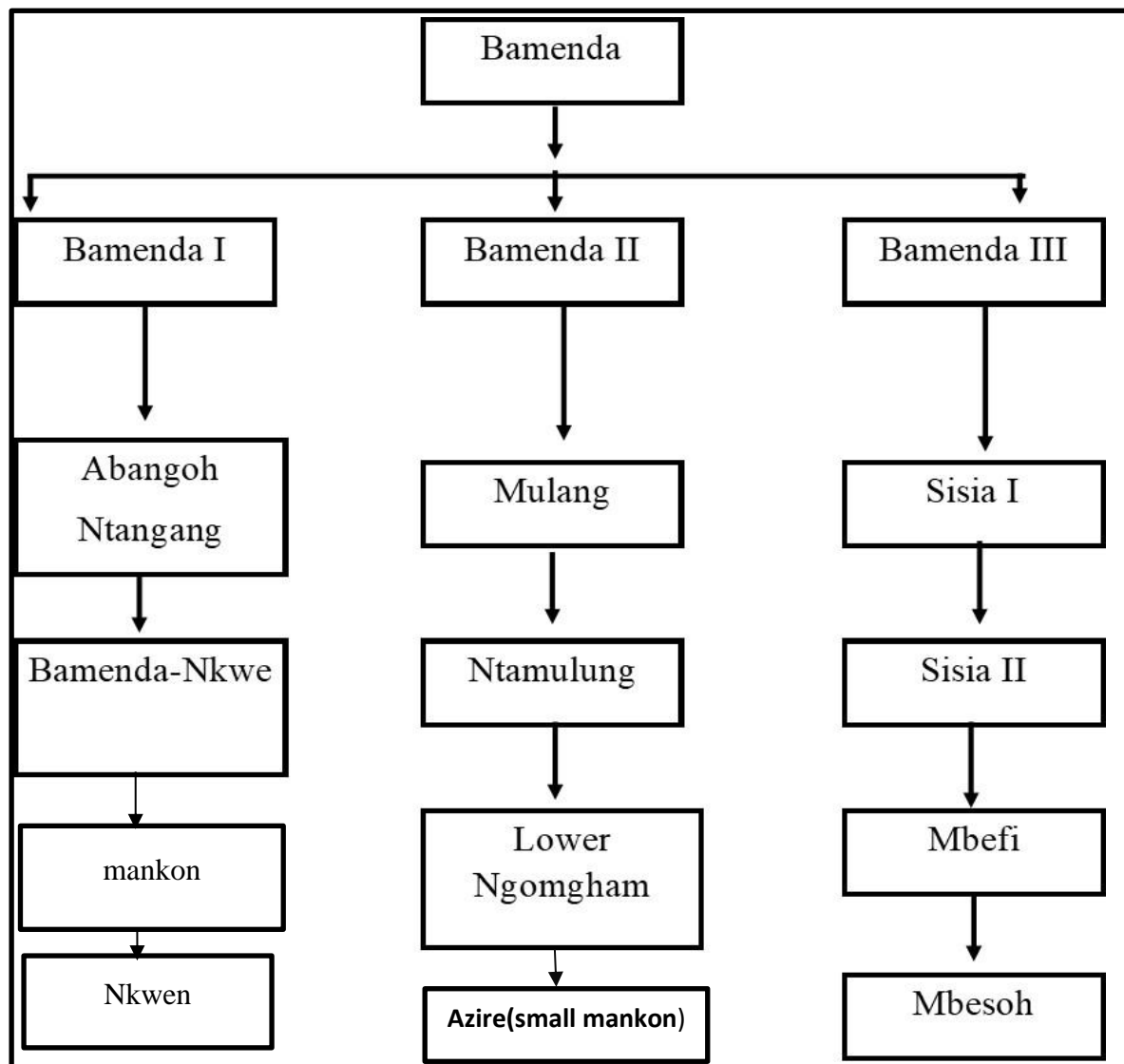
Source: *Adapted and modified from (Mah V, 2010 page 16)*

Figure 5: The different selected quarters in the three municipality of Bamenda town.

These same quarters found in the municipalities were delimited and specialized in figure 6 for better understanding and comprehension.

The 9 quarters in the Bamenda town were grouped into municipalities and quarters population as portrayed on table 2. This table demonstrates the total population in each selected quarter in every municipality and the number of households in each municipality. The total of households in each of the municipality was calculated in order to draw out the intended sample population for the effective administration of the questionnaire.

Table 1: The population of the study

No	Quarters	Municipality Names	Quarter population	Total municipality population	Number of households	Total household HH Municipality
1	Bamenda-Nkwe	Bamenda I	8729		1262	
2	Abangoh Ntangang		3189	8729	514	1776
3	Mulang	Bamenda II	6848		1073	
4	Ntamulung		15847	33328	3268	6230
5	Lower Ngomgham		10633		1889	
6	Sisia 1	Bamenda III	3116		669	
7	Sisia 2		8563	13915	1466	
8	Mbefi		1421		273	
9	Mbesoh		815		108	6746
	Totals		59161	59161	10517	10517

Source: BUCREP, 2010 Population and Housing census. HH=Household

1.13.1 The sample size of the population of the study area

The sample size of the population of the study was drawn from the 10517 households' population of 2010 population census. The reason for this rational use of households was that, it was much easier to administer questionnaires in households than individuals in the streets and this equally reduce cost and facilitate the work. To this effect, 2% of the households made

up the sample population of this study that produce an in miniature cross section of the population.

The reason for choosing a 2% sample size is in accordance with the postulation of Nwana (1982: page 92) which stipulate that:

- If the population of the study is in hundreds, a 40% or more sample should be used,

- If the population is in many hundreds, a 20% will be,

- If the population is in a few thousands, a 10% will do and,

- If the population is in several thousands, a 5% or fewer sample will do (Nwana, 1982, quoted by Mah, 2010)

Furthermore, the 2% is also chosen to ease the work given the fact that the Anglophone zones of Cameroon have been facing and is still facing socio-political crisis which made it difficult to administer questionnaires to a very large population.

The 2% sample size of this study was selected from the total number of households in each municipality using the formula: x* 2/100 where;

   X= number of households

  *= multiplication sign

   2= sample size chosen

   From the total number of households, a 2% sample size household was selected. This 2% sample size gave 210 households to which the questionnaires were administered. This sample helped the researcher to know the total number of questionnaires to be taken to the field for effective administration (Table 2).

Table *2*: The population of the study area and effective respondents

No	Quarters	Name of Municipalities	HH	Total HH	2% size	Total sample size	Effective respondents	Total effective Rep.	% of effective respondents
1	Abangohntangang	Bamenda I	514	1776	10	35	8	28	80
2	Bamenda-nkwe		1262		25		20		80
3	Mulang	Bamenda II	1073	6230	21	123	17	92	80.9
4	Ntamulung		3268		65		50		76.9
5	Lower Ngomgham		1889		37		25		67.9
6	Sisia 1	Bamenda III	669	2516	13	49	7	32	53.8
7	Sisia 2		1466		29		18		62
8	Mbefi		273		5		5		100
9	Mbesoh		108		2		2		100
Totals			10517	10517	210	210	152	152	

HH: Household. Eff. Resp. effective respondents

Source: B UCREP, 2010 National office for census and population studies

Table 3 further illustrates the different quarters in the Bamenda municipality, household's totals in the municipalities, sample totals that were drawn from each municipality and each quarter, effective respondents in each municipality and in each quarter. The totals of effective respondents and percentage of those effective respondents are equally illustrated by this table. The table shows that a total of 210 questions were administered in the field but only 152 of them were returned representing 72.38%.

The spatial distribution of questionnaires is represented on figure 7.28 questionnaires administer in the Bamenda I municipality, 92 in Bamenda II municipality and 32 to the

Bamenda III municipality. This proportionate distribution follows the population size and the household totals to each municipality.
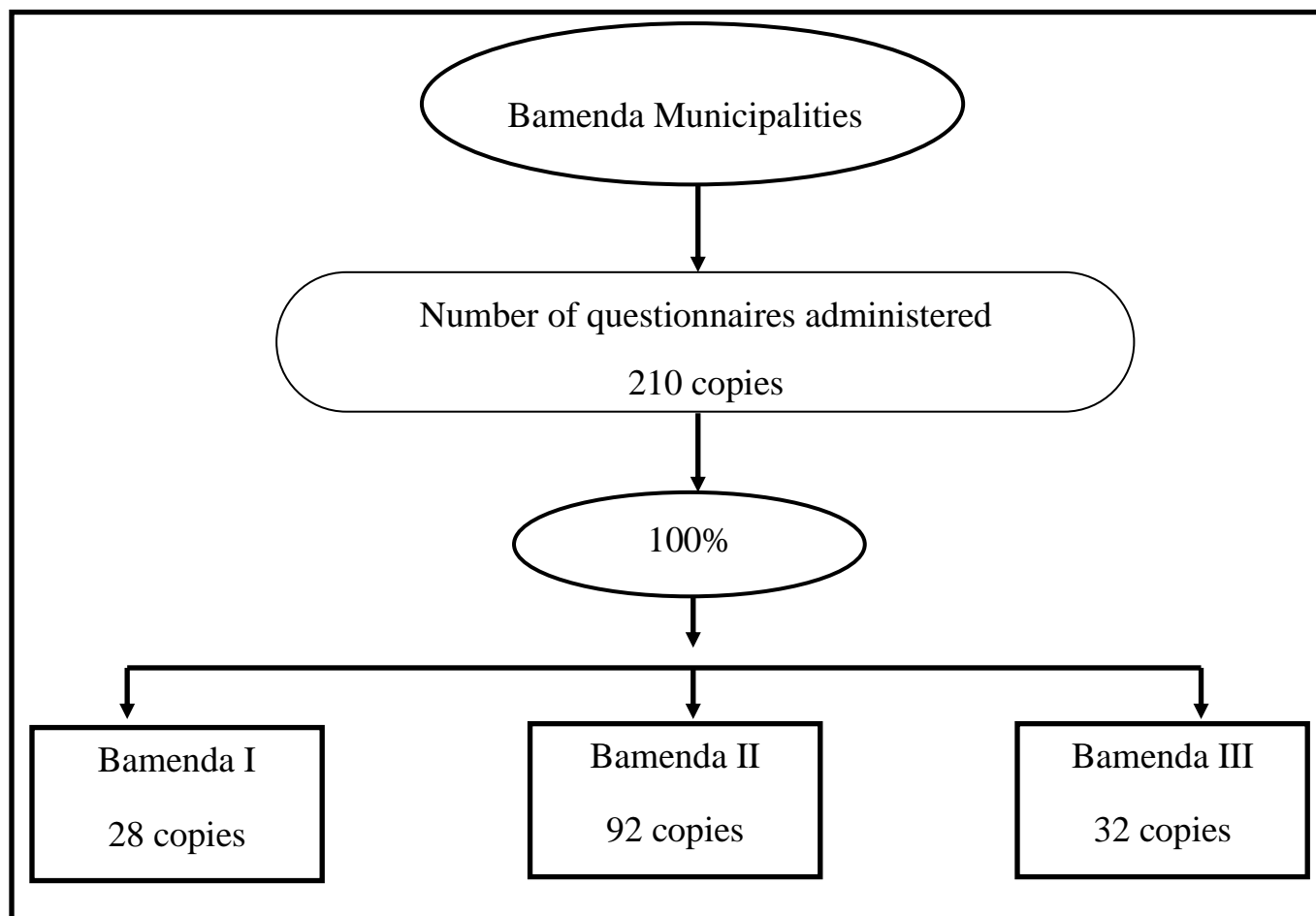
Source: Drown from table 2

Figure 6: Spatial distribution of effective respondents in the three municipalities

Administration of Questionnaires

The administration of questionnaires in Bamenda was through a systematic random sample of each municipality whereby household were selected systematically in each municipality for administration of questionnaires. The questionnaire was prepared to draw information on the urbanization challenges and sustainable management strategies in the Bamenda municipality. These included aspects such as; socioeconomic and environmental challenges that comes as result of urbanization and the management strategies that are being put in place to manage the urban challenges. These questionnaires were administered in households which contained single and multiple response questions.

From these research instrument designed to collect data, a synthetic matrix table was conceived to demonstrate the constructive framework in which the work was framed. This was designed from research questions, objectives, hypothesis methods, concepts/theories used to derive the various chapter outlines as view in the table of matrix.

1.13.2. Operationalization of variables

A critical look at the research questions, objectives and hypotheses shows that we have dependent and independent variables which need to be operationalized to help in building of a questionnaire and equally the type of data to be collected.

Hypothesis 1: The rapid rate of urbanisation in the town of Bamenda is affecting the urban environment to sustainable urban development

Independent variable: Urbanization

Dependent variable: Negatively affecting the socioeconomic

Table 3: The operationalization of the variables of hypothesis 1

Independent variable	Indicators	Dependent variable	Indicators
Urbanization	- High population - Waste management problems - Increase in labour force - Job scarcity - Urban housing problems - Niche commodity market	Negatively affecting the socioeconomic	- Food insecurity - High crime wave - insecurity - Poverty - Social exclusion - Job frustration - Inadequate medical facilities - High cost of living

Hypothesis 2: The uncontrolled urban growth in the town of Bamenda is negatively affecting sustainable urban development process.

Independent variable: uncontrolled urban development

Dependent variable: affecting the urban environment negatively

This hypothesis attempts to establish a link between urbanisation and socio-economic challenges which are barriers to sustainable urban management in the town of Bamenda. Research hypothesis 1 guided the study to collect relevant data to establish a link between ill adapted urbanization process and socioeconomic challenges and the extent to which

urbanization process is negatively affect the socioeconomic of Bamenda town. The urban population of Bamenda has witnessed a significant increase in its population over the years due to natural increase and rural exodus. This increase have greatly affected the people in terms of informal settlement, waste saturation, traffic jam, job scarcity and overcrowding, limited space and among others. In order to verify this assertion, the responses of the respondents were exploited (Table 27).

Alternative hypothesis (Ha): socioeconomic challenges in Bamenda town are of different types which results from weaknesses of urban laws and are caused by high birth rate and in-migration

Null hypotheses (Ho): socioeconomic challenges in Bamenda town are not of different types and are not caused by weakness of urban laws and high birth rate and in-migration.

Table 4: The operationalization of the variables of hypothesis 2

Independent variable	Indicators	Dependent variable	Indicators
Uncontrolled Urban growth	- Informal housing - Problems of waste management - Loss of biodiversity - Land degradation - floods - Poor drainage system	Sustainable urban development	- Town planning - Proper waste management - Access to portable water - wetland surface changes - saturated waste all over the town - well organized markets - urban smart growth

Hypothesis 3: The poor implementation of urban development strategies in Cameroon has rendered the process of sustainable urban management difficult.

Independent variable: Urban development strategies

Dependent variables: management of urban space

Table 5: The operationalization of the variables of hypothesis 3

Independent variable	Indicators	Dependent variable	Indicators
Urban development strategies	- narrow roads - town planning - urban sprawl - limited involvement of all the stakeholder	Management of urban space	- poor housing condition - state of roads - poor drainage - non respect to urban planning laws - inadequate social amenities

1.13.3. Data treatment, presentation and analysis

In this research, several types of data were collected and accorded different types of treatment before presentation, analysis and interpretation. These data principally consist of qualitative and quantitative data. The data collected embodied interview data, focus group discussion data, questionnaires data, cartographic data, and observation data. These data was treated differently and presented in the form of graphics, figures and tables

a) Data Presentation

The processed information was presented using frequency tables, graphs, bar and pie charts. Information obtain from interviews was presented in the form of text. Photographic evidence was represented as plates and photos.

b) Data Analysis

The data collected from the field was analyzed using descriptive and inferential statistics. Descriptive statistics was used to summarize participant socio-demographic data and other categorical data while inferential statistics was used to draw conclusions based on the study of the sample population. Satellite images were analyzed using EDRAS IMAGINE 9.1 and ARCGIS 10.1 while pictures and plates were processed with Adobe photo shop Cs6. Quantitative and qualitative data was used to evaluate the hypothesis and conclusion were drawn based on the analyzed data.

1.13.4. Analysis of Remotely Sensed Data

a) Preparation of Remotely Sensed Data

The data that was used for land-use analysis involved multi-temporal, multi-spectral and multi-resolution range of Landsat imagery from different sensors with the same band combination and different pixel resolutions. The choice of the particular images used was based mainly on the availability of good quality images capable of producing the most desired results (prico 2012). The observation period chosen for land-use analysis was from 1973 to 2023.

The choice of this time periods facilitated a comparative analysis of the land cover and land-use change vis-à-vis urbanization challenges and management strategies. All the satellite images obtained from Landsat maps of 1970 and 2023 are put in Tagged Image Format (TIF) which permit them to conserve their geo-referencing characteristics which allow for easy integration into the plate form of the image treatment software (priso 2012). These images were used to examine changes in the face of the town over the years and to see if the changes have caused more urban problems in terms of socioeconomic and urban environment. This enabled the researcher to make an assessment on urbanization challenges and management strategies in Bamenda town.

b) Processing of Remotely Sensed Data

Landsat satellite images were obtained from isolated bands with each having different reflectance corresponding to particular surface features peculiar to each of these bands. They combined into composite multi-band images and treated in a remote sensing plate form for land cover and land use analysis (Ndi). The shape file of Bamenda was extracted from an existing data base, and overlaid on the mosaic of the four image band and a subset of the image covering Bamenda was created for each of the two reference periods.

An unsupervised classification of each of the images was carried out for spectral discrimination into six classes. A high-resolution satellite image was used to verify this classification. Based on verification, a supervised classification was carried out using the false color composite of the images into four classes of interest in terms of land cover and land use variability and evolution. This classification permitted an appreciation of dynamics in land cover and land use in Bamenda. After classification, the resulting images was exported to ArcGIS 10.2 plate form for layout. This was followed by results and analysis. Many tools and instruments were used in this study which assisted in the collection of data (table 6)

Table 6: Tools Instrument and uses

Tools and instrument	Uses
Microsoft word and Excel	To treat qualitative data to obtain graphs
Adobe photo shop	To enhance photos and clear off impurities
ArcGIS (shape files) and Adobe illustrator	To realize maps
GPS	to collect waypoint
A digital camera	To capture phenomena
Questionnaire	To collect quantitative data
Google maps	To collect information on space and to verify settlements and relief maps realized
The eye	It was used to observe phenomena
Appendices	For the clarification of assertions made in the study

The work began with a plan adopted for the reader to have a vivid rundown of the content of the work from general introduction to general conclusion.

Table 7: Table of matrix

RESEACH QUESTIONS	RESEACH OBJECTIVES	RESEACH HYPOTHESES	RESEACH METHODOLOY	THEORIES AND CONCEPTS	Corresponding chapters
What are the challenges and consequences of sustainable urban development in the town of Bamenda	To investigate challenges of sustainable management strategies in the town of Bamenda	Sustainable urban management strategies in the town are poor and ineffective	Questionnaire administration, observation, inquiries, interviews and focus group discussions.	The theory of spatial diffusion of innovations	
How does the urbanization process in Bamenda affects socio economic life of people in Bamenda	To find out how the rapid rate of urbanization in the of Bamenda is a challenge to sustainable urban management	The rapid rate of urbanisation in the town of Bamenda is negatively the environment of sustainable urban development	Questionnaire quantified in %, clusters, observation, interviews	Socio-economic development /development theories	Urbanization implication on sustainable urban management in the town of Bamenda
What are the socio economic challenges consequences of sustainable urban development in Bamenda	To investigate the socio economic challenges to the sustainable management in the town of Bamenda	The uncontrolled urban development process in Bamenda is negatively affecting the sustainable urban development	Questionnaire observation, interviews and FGDs	The theory of necessity for development	The socio economic implication to sustainable urban management in Bamenda town
What is the effectiveness of the sustainable urban management strategies put in place in the town of Bamenda	To evaluate the effectiveness of sustainable urban management strategies in town of Bamenda	The poor implementation of urban development strategies in the town of Bamenda renders the sustainable urban development difficults	Questionnaire observation, interviews and FGDs	The theory of collective action	Sustainable management strategies of urban challenges in the town of Bamenda

CHAPTER 2

URBANIZATION IMPLICATIONS ON SUSTAINABLE URBAN MANAGEMENT IN THE TOWN OF BAMENDA

2.0. Introduction

Urban development trend and urbanization in the town of Bamenda has witnessed significant changes in its land cover/land use from 1973 to 2024. These changes have been masterminded by anthropogenic activities borne by urbanization. Priso (2014) underscored that, the evolution of urban planning in Cameroon until the early 2000s was characterized by obvious misunderstanding in the implementation, with the end results being uncontrolled development of urban areas. Urbanization is a phenomenon that affects many countries of the sub-Saharan Africa. In Bamenda Municipality, urbanization has greatly affected the natural environment such as the forest, the vegetation and the water bodies and housing styles. This chapter focuses on the effects of urbanization in the urban environment of Bamenda municipality projecting significant data on how urbanization have evolved in the town of Bamenda for over the decades. In a bid to verify the second hypothesis of this study, the specific research question is based on the premise that, the evolution of Bamenda municipality in relation to urbanization challenges examined within four time periods: 1973, 1988, 2003 and 2023. Within these periods, the land cover/land use maps of 1988 corresponding to the first master plan (1985) of the town and 2015 corresponding to the second master plan of the town were examined and analyzed in order to investigate and show the manifestation of urbanization challenges in the Bamenda municipality.

2.1 Evolution of urbanization rate in the Town of Bamenda

The 1970s in the Bamenda municipality was seen to be a period with a spectacular increase in population as a result of the increase trend in migration from surrounding rural areas. The presidential Degree No: 77/203 on the 29/06/1977 converted Bamenda in to a municipal council (Bamenda master plan, 1985) and later the capital of the northwest province. Due to the central location of Bamenda, she became the Headquarter of the North West Region of Cameroon, the socioeconomic nerve-wire, the pivot to major political, religious and cultural happening in Cameroon Pinson (2010).

The oil production that began in 1978 in Cameroon acted as an engine of economic growth Priso (2011). This led to high expenditure on civil services, subsidies to inefficient enterprises, low return and capital-intensive investment in the 1990s (world, 1995). This played

a paramount role in growth of the Bamenda municipality as she experience enormous construction works from the period of the economic boom, which allowed revamping of roads over the municipality and national territory.

The visit of the president of the republic of Cameroon to Bamenda in 2010 led to the significant growth and development, with improvement in the state of social infrastructure and services Priso (2011). Major quarter roads in Bamenda Municipality such as Ntache, Muyu quarter, Kumbele were opened. Also, the main road that lead out of town (Bamenda-Baffousam) was tarred in 1977. The construction of roads brought about rapid urban growth in the Bamenda municipality, coupled with the inadequate social amenities in other surrounding towns and villages like power supply failures, poor health services, deplorable roads conditions and inadequate educational facilities forced people to move out of such depressed areas into the Bamenda municipality. During this period, social facilities developed such as opening of many enjoyment spot like bars, night clubs in Bamenda municipality. These pots especially bars acted as resting points to most migrants moving to the coast or coming back from the coastal areas. This attracted many people in the area and some ended up settling around the Abangoh central and Bamendankwe. Also, the arrival of missionary bodies further increased the place of growth in the Bamenda municipality. These missionaries opened churches, schools and hospitals which attracted many Christians and workers into the area. Satellite images for 1973 and a land use/land cover map was produced using GIS packages as shown on (Figure 7).

Source: landsat (1973) Google map NIC, Google Earth images and Field work

Figure 7: Land use and land cover situation in the Bamenda municipality for 1973

Table 8 shows the area of the different land use/land cover patterns in 1973 (bare surface/farmland, built up area, woodland savanna, mosaic forest) in kilometers square and in percentage in the Bamenda municipality

Table 8: land use and land cover situation of 1973 in the Bamenda municipality

Class name	Surface area in km2	Percentage (%) coverage
Bare surface/farmland	16612	9.0
Built up area	2466	1.3
Woodland savanna	83097	44.9
Mosaic forest	83062	44.8

Source: Data derived from the LULC map of the Bamenda municipality in 1973

Despite the improvement in road network in Bamenda municipality, economic crisis that hit Cameroon in the late 1980s was accompanied by a negative growth rate of 3% to 4%. The government had to apply very strict budgetary policies which led to the reduction in public investment on social infrastructure and facilities. In 1993, there was a 70% reduction in the salaries of public servants which was aggravated by the 50% devaluation of the CFAF in January 1994, thereby increasing the rate of inflation in the Bamenda municipality. This was followed by the closure of restructured, semi-public and private enterprises, retirement and layoff staffs Ndi (2011). This led to the enactment of the law on housing development and high expenditure on consumer goods. In addition, this resulted in a sharp increase in urban poverty pushing a large proportion of the population to settle in unauthorized location such as steep slopes (Abangoh and Bamenda escarpment).

The Structural Adjustment Programmed (SAP) was instituted to stabilize the economic situation of the country. This meant states recession from the provision of social amities, the retrenchment of workers and salary slash. This led to a fall in real income and directed the attention of the government and individuals from housing construction and maintenance of most of the infrastructure built before and after independence. Hence, the town was deprived of basic infrastructure and the deterioration of existing ones. This resulted in increased poverty associated with poor housing conditions and environmental deterioration. This situation

engendered the spontaneous settlement by low income earners on steep slopes in the neighborhoods such Abangoh and Sisia with accompanied consequences.

This situation compelled the planning authorities to draw up the first master plan of Bamenda in 1985. The master plan was aimed at organizing and planning housing and social economic and cultural activities, monitoring and controlling land use and eliminating incompatible land uses (Sule, 2005) in the town. This was due to the fact that a lot of valuable time which could have been use to by authorities in developing the town was spent on trying to revamp Cameroon economy affected by the economic crisis, thereby, worsening the housing situation in the Bamenda municipality.

2.2. Spatial Evolution of Bamenda urban space in 1988

By the year 1988, Bamenda municipality expanded exponentially, it's engulfed the fringes and extensive marginal lands such as the steep slopes located at Abangoh, Nta'afi, Achichum. The steep slopes of the Bamenda 1 escarpment was also haphazardly colonized for housing development and agriculture without taking into account the fragile nature of the slope. This was compounded by the continuous rural-urban migration in to Bamenda municipality which served as a commercial and administrative area in the Northwest Region of Cameroon. The socioeconomic and political changes experienced in the Bamenda municipality resulted in increased demand for housing and social infrastructure, as depicted on the satellite image of Bamenda in 1988 on   figure 8.

Source: landsat (1988) Google map NIC, Google Earth and Field work (2023)

Figure 8: Land use and land cover situation in Bamenda municipality for 1988

Table 9 present the surface area covered by the different LULC situation in 1988 (Bare surface/farmland, Built up area, Deciduous woodland, Mosaic Forest) in kilometer square in the Bamenda municipality.

Table 9: land use and cover of 1988 in the Bamenda municipality

Class Name	Surface area in km2
Bare surface/farmland	35731
Built up area	9515
Deciduous woodland	96766
Mosaic forest	43226

Source: Data derived from the LULC map of Bamenda municipality in 1988

2.2.1 Vertical Evolution of the Bamenda municipality urban in 2003

According to the results from the Bamenda city council report of 2015, the population of Bamenda increased from 203,480 in 1987 to 427,149 inhabitants in the early 2000s that is from 2000 to 2005. Furthermore, the report indicates that 18.6% of the population of the North West Region lived in Bamenda within this period with 28359 inhabitants while at the national level, Bamenda had 1.8% of the population of Cameroon. The presidential degree No 2008/021 of 17th January 2008 changed the status of Bamenda by creating the Bamenda city council (BCC), thereby dividing Bamenda into three sub-divisional council areas, here referred to as Bamenda I, Bamenda II, and Bamenda III (Bamenda Master Plan, 2012). With this, Bamenda consolidated multiple administrative functions as Divisional capital, Sub-divisional capital and Regional Capital of the North West Region which acted as a pulling force, attracting many people to work in Bamenda municipality and render services especially with the creation of several schools ranging from primary, secondary to university level which contributed in swelling up the population of the Bamenda municipality, implying an increase in demand for housing. This period witnessed dramatic changes in infrastructure such as schools, pharmacies, churches among other services. Also, educational institution like government secondary school, primary and Nursery among others attracted many students and pupils. All these services acted as a driving forces that resulted in dramatic growth in the neighborhood and increased the demand for housing in the Bamenda municipality. Satellite imageries for 2003 were downloaded and a land use and land cover map was produced using GIS package as shown on (Figure 9).
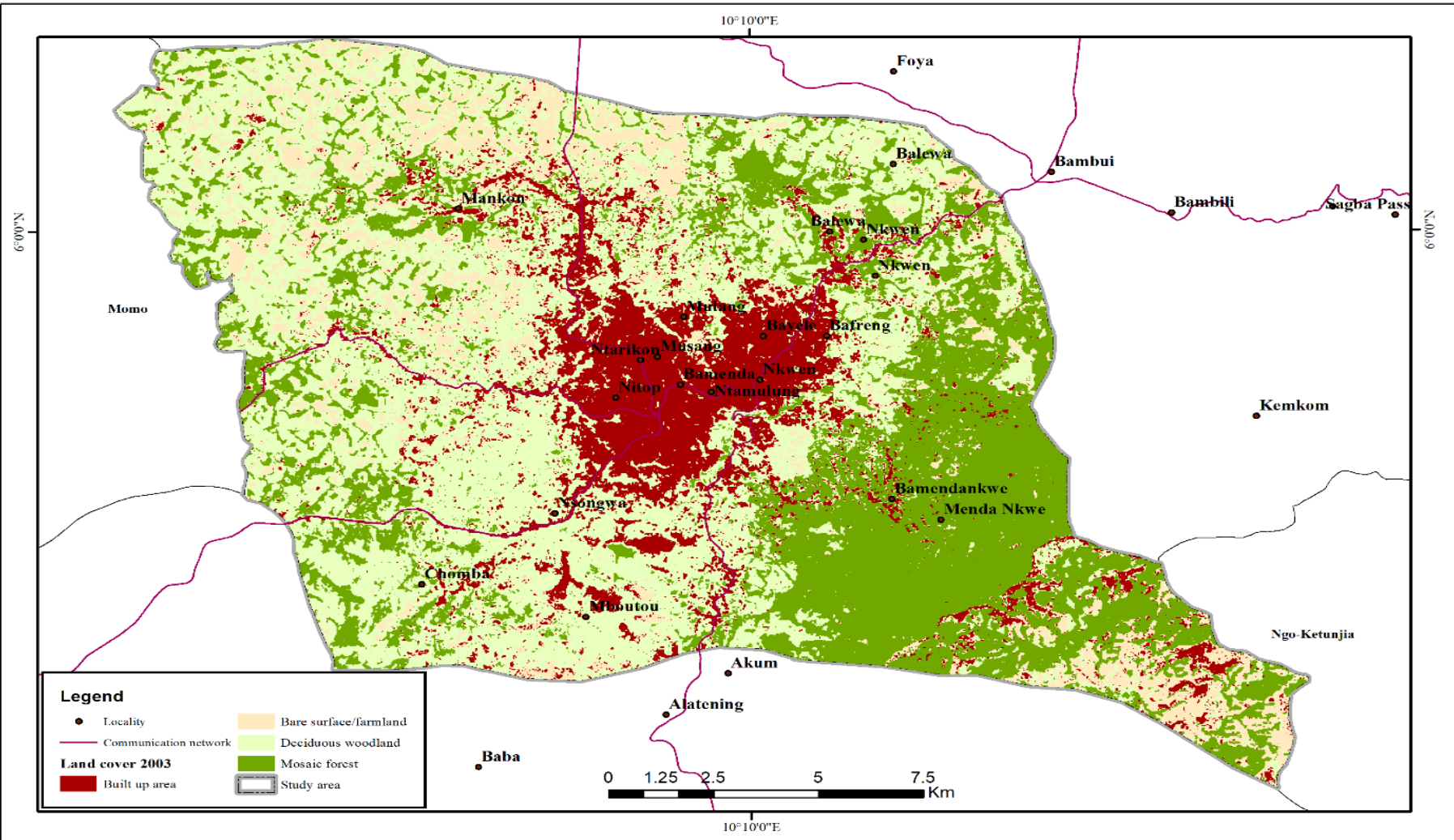
Source: Landsat (2003) Google map NIC, Google Earth images and field work (2003)

Figure 9: land use and cover situation in the Bamenda municipality for 2003

Table 10: land use and cover situation of 2003 in the Bamenda municipality

Class name	Surface area in km2
Bare surface/farmland	17328
Built-up area	13008
Deciduous woodland	82397
Mosaic forest	71611

Source: Data derived from LULC map of the Bamenda municipality 2003

2.2.2 Spatial Evolution of Bamenda municipal urban space in 2023

The period between 2003 and 2023 witnessed significant horizontal growth due to the presidential Decree transforming Bamenda into a city council Priso (2012). This decentralization of function increased centralization of services in the city. The sub-divisional councils were given powers and finances to carry out development projects in their council areas that led to spatial expansion of the town. This period witnessed an increase in population, tremendous changes in the land uses cropping up. Built-up areas have increased rapidly to meet the need of the rising population. There has been the proliferation of so many schools, hospitals, churches, banks among other services as shown on the map. This development has facilitated the expansion of the town from the center towards the urban fringes. The periods saw the increase in land values especially within the urban space resulting in spatial expansion and intensification of land uses. This frayed the urban fabric and increased pressure on land, far more than the case in the early 1973 and 1988. As a result, the new arrivals, especially the poor displaced by housing market have little alternative than to occupy marginal areas (along river bank, hilly slopes and swampy areas) where rent and land prices are relatively cheap as shown in plate 4 below. Satellite imageries for 2023 were downloaded and a land use and land cover map was produced using GIS package as shown in plate 1.

Plate 1: Constructions along River channels and Hilly areas

A shows flood in Nkwen while B show accumulated mud C shows and abandoned house and D shows a house beside the flood in Nkwen municipality.

Source: Land satelite (2023) Google map, NIC, Google earth images and field survey 2023.

Figure 10: Land use and Land cover situation in the Bamenda Municipality for 2023

Table 11shows the surface area of the different LULC patterns in 2023 (Bare surface/farmland, Built up area, Deciduous woodland, Mosaic Forest) in kilometers square in the Bamenda municipality.

Table 11: Consequences of crisis on the educational sector (sampled areas/institutions)

Class Name	Surface area in km2
Bare surface/farmland	45521
Built-up area	13901
Deciduous woodland	67021
Mosaic forest	59688

Source: Data derived from the LULC map of the Bamenda municipality in 2023

2.2.3 Land use and land cover changes from 1973, 1988, 2003 and 2023

The Bamenda municipality has undergone remarkable changes in its land use and land cover situation over time and space. The statistics generated from the four time periods according to the land use and land cover patterns and changes revealed both positive and negative changes in land use and land cover patterns in the Bamenda municipality as shown in table 12.

Table 12: land use/land cover situation in the Bamenda municipality for 1973, 1988, 2003 and 2023

Surface area	1973		1988		2003		2023	
	Area in km2	Area in %	Area in km2	Area in %	Area in km2	Area in %	Area in km2	Area in %
Bare surface	16612	9.0	17328	8.9	35731	18.7	45521	26.8
Built-up area	2466	1.3	9515	4.9	13008	6.8	13901	8.2
Deciduous woodland	83097	44.9	96766	49.6	82397	43.2	67021	39.5
Mosaic forest	83062	44.8	71611	36.7	59688	31.3	43226	25.5

Source: Derived from LULC maps of 1973, 1988, 2003, 2023

Table 12 indicates that bare surface area experience a tremendous positive and steady increase in land use and land cover from 16612 in 1973 to 17328 in 1988 and further increases to 35731 in 2003 to 45521 in 2023. Built-up increase from 2466 in 1973 to 9515 in 1988 and later witnessed an increase to 13008 in 2003 and 13901 in 2023. More so, deciduous woodland

increased from 83097 in 1973 and further increase 96766 in 1988. Land use/land cover later witnessed a dropped from deciduous forest from 82397 in 2003 to 67021 in 2023. Also, mosaic forest witnessed a constant decreased through four periods at 83062 in 1973 to 71611 in 1988 and later decreased to 59688 in 2003 and 43226 in 2023.

1973

1988

2003

2023

Source: Landsat (1973, 1988, 2003 and 2023) Google map NIC, Google Earth images and field work (2023).

Figure 11: Land use and cover situation in the town of Bamenda for 1973, 1988, 2003 and 2023

2.3 Urban challenges in some sample quarters in Bamenda

To identify urbanization challenges in the study area, a number of respondents responded positively, Bamenda municipality has since in the past years been identified as an urban area facing a lot of urbanization challenges. A great majority of those respondents living in the Bamenda municipality identify truly that there are urban challenges in the study area with 84% of respondents who agreed that because of increase in birth rate and inflow of many people in the area, many things have changed even prices of agricultural goods and many recreational facilities has promoted rural exodus in the study area while 5% disagree that there is no urban challenges. According to field survey, urban challenge is the order of the day in the Bamenda municipality to the extent that most of the respondent that is 11% did not decide anything as concern urbanization challenges in the study area. Below are some environmental challenges.

- Flooding, mostly prone in some areas like small Mankon and, Mulang

- Poor waste management, mostly prone in the central city of Bamenda

- Landslides, mostly prone in up station of Bamenda

- Pollution   mostly experiences in the central city of Bamenda

- Loss of Biodiversity experience in the town of Bamenda

2.3.1. The urban challenges in Bamenda.

From the responses gotten from the questionnaires administered, it shows that within the coming years, urban challenge in the Bamenda municipality will occupy all the quarters in the study area. This is because the researcher in the field of study after close observation, noticed that, urban challenge is gradually taking the whole town as the town is expanding fast toward the peripheries. In the field, 75% of the respondents accepted that in the coming years, urban challenge is likely to take up the whole of the study area while only a few of them that is, 10% were on the opinion that they do not see anything of such in the coming years. So prospect of urban challenges as a result of uncontrolled growth is high while 15% of the respondents did not decide anything as concerned urbanization challenges in the study area.

2.3.2. Perception of residents of Bamenda toward urbanization challenges

From the responses gotten from questionnaires administered, feeling toward urban challenges in the study area was high, a greater number of respondents with 73% were not happy with this issue of rapid urbanization in the study area because of its present consequences and future, but some of them are happy with the growth and some of them explain that urbanization is a

good phenomenon but that its only need to be controlled by the councils and the legal authorities involved in the study area. Some of them that is 19% feel unsatisfied with the problem while some of the respondents with 8% being indifferent with rapid urbanization in the Bamenda municipality. So with this negative idea in mind by some of the respondents, it becomes difficult to fight against rapid urbanization in the study area and the negative consequences that comes with it.

2.3.3. Urbanization and development

Rapid urbanization in the Bamenda municipality has also been described by some respondents as an agent of development and to some, it is a bad phenomenon to the Bamenda municipality. According to field observation, urbanization in the Bamenda municipality is for development because urbanization have brought so many developments in the study area both economically, socially and politically, coupled with a diverse culture from most tribes of Cameroon. In the field, 77% of respondents in the field agreed that rapid urbanization in the Bamenda municipality has brought about development due to the multiple activities present in the area, 15% of the respondents did not abide to this idea while 6% of them remained undecided that is neither agreed nor disagreed. So, with critical look in the field by the researcher and according to respondent responses, truly urbanization in the Bamenda municipality is for development though with some challenges faced by urban dwellers.

2.3.4. Urbanization challenges in the Bamenda Town

The physical element such as climate, relief, drainage, vegetation, geology and soil have played a primordial role in the rapid growth leading to infrastructural development and housing challenges in the Bamenda municipality.

Bamenda municipality has a fresh climate with moderate temperature, which favors human settlement. This climate is influenced by two air masses: the northern east trades (Harmattan haze) and south west monsoon winds, which cause the marked dry and rainy season respectively. Absolute annual average precipitation ranges from 1700mm to 2824mm.The rainy season is usually longer and last just for four months from mid-November to March (North West Regional service for Meteorology, 2016). This plays a vital role in human occupation of the steep slopes and low-lying swamps. In the event of excessive rainfall, environmental problems such as landslide and floods are common around mail 4 Nkwen and Mankon especially in the month of July, August and September. This is the case in Bamenda, where the urban poor construct houses on steep slopes ant wetland, whereby, during excessive

rains, flooding and landslides become the order of the day like case of September 2009 when flooding occurred mulang, Below Foncha, Ntamulung, old Town, Sisia, new layout resulting in two death, destruction of property and farmlands (kometa et al, 2012)

The average temperature ranges between 24°C at lower altitude and 16°C at lower and higher altitudes. Relief greatly affects the temperature of Bamenda municipality. Sunshine is relatively high with an annual total of 1900 hours with 50% in the dry season, 37% in the growing season and 13% during the harvesting (Achuo-chi, 1999). The high solar insulation in this tropical climate zone produces high energy fluxes. An interesting meteorological feature of Bamenda urban area is the protracted dryness. This creates drought-like conditions as the rain clouds that used to cover the hills slopes systems disappear and the local water resources get dried up. Humidity remains high at about 75-80%. The combination of high solar energy inputs, moderate high temperature and high relative humidity accelerates the weathering process. This issue of moderate temperature in Bamenda municipality has attract many new comers in the area there by leading to urban challenges because everybody like to live in areas where the temperatures are moderate.

2.3.5. The influence on relief on urbanization in Bamenda

The relief of Bamenda municipality is undulating consisting of hills, valleys and lowlands. Generally, the relief of Bamenda shows a scenery where lowlands are intercepted by highlands. Bamenda municipality lies at an altitude of 1,614m above sea level (Achuo-chi, 1998). The town lies along the Cameroon volcanic line and exhibits two very distinct relief units, the High Lava plateau (Up station) with an altitude of about 1,400m and the lower plateau known as Down Town Bamenda made up of Nkwen and Mankon villages with an average altitude of 1,100m above sea level. These relief features act as deterrent to urban growth though broken in some places, the slope escarpment traverses the urban space dividing it in to the up-station and downtown areas. The high elevation section of the town is prone to landslides and rock fall especially after protracted periods of torrential rainstorms. Near vertical slopes occur in the immediate vicinity of the fault line.

Though man has defied the physical constraints and inhabited parts of the escarpment, the difficulties and threat of slopes failure to houses and human life remain evident. Most of the built-up areas on this escarpment seem to be in transit whenever the heavy rains and surface runoff show their ugly appearance (Lanbi, 2004). This varied relief offers diverse opportunities to different categories of urban dwellers who find their housing sites in relation

to their means. The nature of the relief has greatly pull administrative services and most business activities in Bamenda municipality especially in Bamenda I thereby leading to increase urban growth in the area where by a lot of people move to the peripheries of the town to build their houses thereby leading to urban sprawl in some areas.

2.3.6. The influence of drainage

The relief of Bamenda municipality has greatly influenced the drainage of the region. Very few rivers and streams drain the area. The most important is the river Mezam (and its tributaries) which flows from the Bamenda I escarpment through the city center and passes through the villages of mankon. The Ayaba and Liberkam Streams feed the river Mezam. These streams have a dendritic pattern. The River and its tributaries are responsible for the climatic hazards especially floods which affect mostly the urban poor construct houses on flood plains.

The streams take their rise from the high plateau and reach the foothills through waterfall over the bare hills such as that found in Sisia. Since the streams are youthful, their flow is rapid. Thus, debris runoff from the slopes becomes part of the input of the stream channels. During the rainy season, the dendritic streaming system combines with various erosional processes subjecting houses and properties, particularly along stream course, to periodic flooding during torrential rainstorms resulting in further destruction.

2.3.7. The soil and the vegetation

- **Soils**

According to Ndenecho et al 2004, the Bamenda escarpment is made up of volcanic rocks called trachyte with lateritic soils which are reddish as the dominant soil type. The soils are heavily leached and eroded, thus, cannot support dense vegetation and agricultural activities. The nature of this soil encourage torrent processes and is one of the factors responsible for the presence of gullies on bare surfaces evidence are seen in the Bamenda I especially reason why agriculture in the area is mostly practice at the out skirt of the town toward the suburbs of the study area. The valley are covered with alluvium washed from the escarpment, which holds much water. Alluvial soils are found along river courses, which attract especially the urban poor to occupy this area. Due to the increasing rate of urbanization and ecological marginalization, they are forced to colonize and cultivate these marginal flood plains. These are sites where urban agriculture are common with the presence of small farms and gardens found around most houses and the valleys harbor debris which are rich in minerals matter. The

fine-grained brown soils are used to form mud blocks, which are used to construct houses in the Bamenda municipality

- **Vegetation**

The vegetation pattern of the Bamenda municipality is the direct consequence of climate and increased anthropogenic disturbances brought about by urbanization. The vegetation type is mainly savanna with patches of garlery and exortic forests. This is due to the intense dry season and sunshine which gives little room for the development of the forest vegetation. This is further compounded by the poor lateritic soils with limited nutrients to support maximum forest growth. Grooves and raffia palms dominate riverine slopes and in the most places, afforestation with eucalyptus trees has greatly modified the savannah like the case in Bamendakwe (Ako, 2016). Remnants of the forest (forest Refugia) indicate that Bamenda was formally an extension of the Tropical Rainforest and due the anthropogenic influences; the whole landscape of Bamenda I has been transformed in to a cultured vegetation (eucalyptus) and grassland. Perhaps, this mountainous backbone was either completely forested or covered with moist montane forests. Very little of this climate vegetation remains today. The original forest has been replaced with different kinds of savannah distinguished from the original forest and woodland by a continuous grass layer. The growth of this forest has been hampered by anthropogenic activities brought about by rapid urbanization in the Bamenda municipality. The rapid urban growth in the Bamenda municipality is seen through the clearing down of large portion of the forest to make way for human settlement.

2.3.8. Forest and Fauna

The only natural forest is the Bafut-Ngemba forest. This is a potential for the promotion of tourism. The natural forest occupies 1778 hacter while registered private forest occupies 24 hectare. Total surface area occupied by the forest is 1802 hectare representing about 16% of the total area in Bamenda. The natural forest is under threat as illegal exploitation of the forest is being practiced with impunity. The forest is exploited for habitats reasons (wood for construction) and for energy use that is fire wood and its derivative, charcoal and wood shavings (used for local brazing and poultry production). No inventory of the animals in the forest has been made. Stories have been told of the presence of gorillas, antelopes and chimpanzees at the reserved forest but the pressure put on the forest by humans have caused the extinction of these animals. However today, artisanal hunting is being practiced. Animals like Cane rats and birds like Bush fowls' are being hunted. Most animals are domesticated for

household economic purposes. These include pigs, rabbits, sheep, cattle and goats. Birds kept for same purpose include table birds, ducks and traditional fowls (Table 12).

Table 13: major Forest Species within the Bamenda municipality

N0	Common names	Scientific names	Habitat	Uses	Part used
1	Eucalyptus	Eucalyptus Saligna	Exotic species	Furniture, building, medication, fuel wood	Wood leaves
2	Cypress	Cypress spp		Fence, windbreak	
3	Prunus	Prunusafriccana		Medication	Bark
4	Callistemon	Callistemon viminalis		Ornamental	
5	Pine	Pinuselliotti Pinusspp	Exotic species	Furniture, building	Wood
6	Royal palm			Ornemental	
7	Black fruit	Canariumschweinfrurhii	Exotic species	Food, furniture, building	Fruit, wood
8	Voacanga	Voacangaafricana		Food, medication	Fruit
9	Filao	Casuarinaequisetifolia	Exotic species	Environmental friendly tree, fuel wood, building	
10	Gnelina	Gmelinaarborera	Exotic species	Firewood, poles	Wood

Source: Regional delegation of forestry, NWR

Table 13, present major forest species within the Bamenda municipality stating their common names, scientific names, habitat uses and part used for all type of 10 tree species. It' difficult to have wild animals within the Bamenda as many of them have been domesticated. Nevertheless, some scared forest (Mendankwen) can have some wild animals but any inventory has not been done to know which types of animals are there and their number.

2.4 Reason for Informal Settlement in the Town of Bamenda

Despite the risk nature of some quarters of Bamenda municipality like floods, landslide, and rock fall, these reasons testify the difficulties faced by some dwellers of the study area as some people still prefer living in risky quarters. These quarters continue to grow in number over the years despite the restriction of some them by the government and local authorities. The following are some of the reasons gathered from the field as to why those in risky areas prefer to remain these despite the risks. Involved.

2.4.1. Privately owned Residence

The principal reasons advanced by inhabitants of these quarters why they cannot quite their place of residence despite the challenges faced in this area.is because they live in their personal houses among other reasons. Abandoning their house to go elsewhere is difficult and expensive for these settlers. They prefer to continue living in these areas despite the challenges they faced than going elsewhere to start a new life which may be difficult for them.

The low cost of land and houses away from the city as compared to other residential areas of the town close to the city center accounts for the growth of urban problems in the Bamenda municipality. Some migrants who are poor and cannot pay for high-cost houses always end up in risky environments and ghettos where houses and land is cheaper as the best site for settlement. This account for the growth of urban problems in the Bamenda municipality.

Nearness to job site has become one of the most important reason for residing in the risky neighborhood of the study area. Most people living in the Bamenda municipality live toward the up-station where all the administrative services are being located. More so most of the farmers living in Abangoh are also there because of the presence of fertile soil in the area. The next reason for the habitation especially in sprawling neighborhood in the Bamenda municipality is land inheritance, land ownership in these quarters of the town especially risky quarter is mostly based on customary norms. This land is transferred from one generation to another within the family circle and the person inheritance, they find it unlawful to abandon their ancestral sites for other areas. They also believe that, their ancestors will always be there to protect them from any danger or risky than elsewhere. This accounts for the growth of urban problems in the Bamenda municipality.

2.4.2 Family Ties

During the field study, it was observed that family ties played a role in influencing the growth in Bamenda municipality. It was discovered that when a person from a particular village comes and settle in a particular area, he/she later invites his relatives or friends to join him/her in that area. This is the case with the inhabitants of Bamenda-kwe, sisia who were mostly people from the west region of Cameroon. They testified that, through interviews and administration of questionnaires that they are in some quarters in the Bamenda municipality because of family ties.

2.4.3 Social ills of the city center

The social ills plaguing the city center forced some urban dwellers to prefer the outskirts or risky zones and the ghetto areas of the town that are bit free from social ills. Through focus group and some interviews conducted in the field, some respondents hold that, social ill of the city center forced them to indulge in the risky areas. Some of the social ills in the city center included; high crime wave, limited space, pollution and overcrowding. This also accounts for the growth of some risky quarters of the Bamenda municipality like Bamendakwe, mulang and Mbefi

2.5 Reasons for Residing in Risky quarters

Figure 13 analyzes reasons for residing in risky quarters with many motives by different inhabitants of Bamenda municipality.
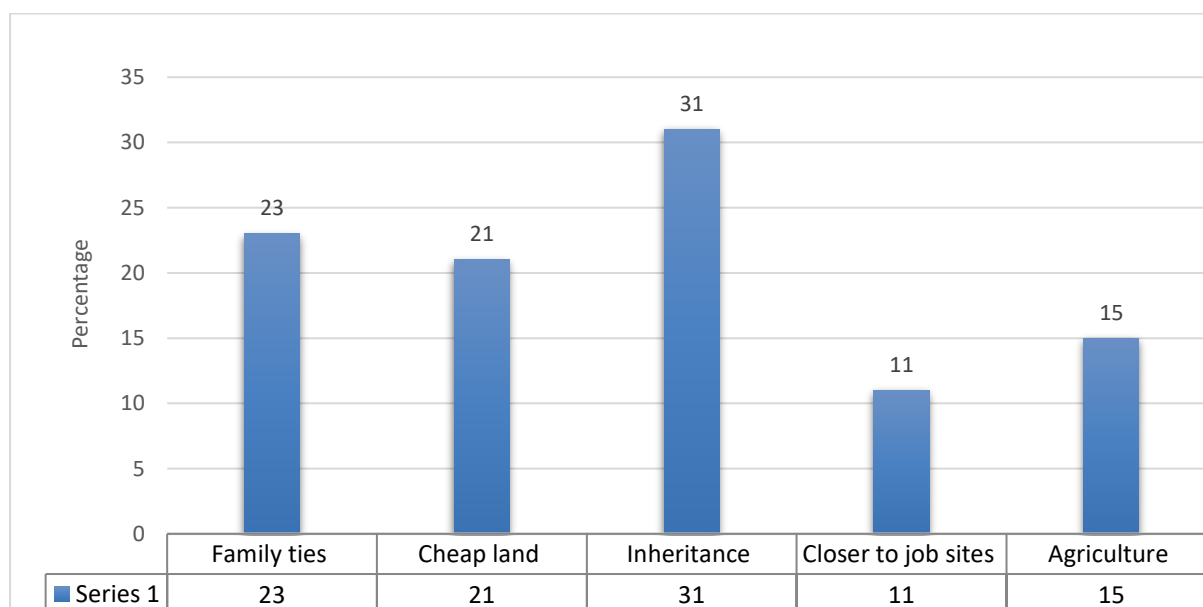
Source: Field work, 2023

Figure 12: Reasons for residing in risky quarters

Figure 12, shows respondents responses for residing in the risky quarters of the study area. A few percentages of them that is 23% of the respondents answered positively that one of the most reason why there are living in the risky quarters of Abangoh and Sisia is because it is their personal residence that have been constructed there. 21% of them confirmed that they settle in the area because of cheap land as they could afford expensive land in the city center. More so, 31% respondents accepted that inherited land and homes is their major reason to why they are living in the area while 11% affirmed that it was because nearness to their job site as they prefer to stay closer to their job site to avoid spending much on transport and lastly, 15%

of the respondent responded that Agriculture was their main source of income so they prefer to stay in these risky areas. The researcher interview of the old mothers Sisia 2 to why know why they continue living in this zone for a long time despite warning   from the authorities and the risks in the area.

2.6 Manifestations of Urbanization Challenges in Bamenda Town

There has been a great evolution in the functions offered by the Bamenda municipality with several period involved as presented in the phase above. The increase in population of the Bamenda municipality was the main driving force toward human settlement. Human settlement dynamism was manifested through the densification and expansion of shelter from the mother settlement in the urban area towards the rural settlement through expansion (Mbanga, 2018). The complete process was accompanied by full dynamism in the functions offered by the Bamenda municipality as shown in the time period above. This human settlement came with a lot of environmental problems which were identified from respondents during field work.

2.6.1 Environmental Related Challenges

Bamenda can be described as a brown city as it is home to several environmental hazards such as flooding, landslides, storms, climate change, and poor waste management amongst others. From Field evidence revealed that 75% of the respondent have experienced a flood occurrence within the past two years. Flood occurrence is a consequence of uncontrolled settlement, the increase rate at which surfaces are being paved, new houses constructed and stream channels distorted and reduce in width span, flooding now features top of the list of natural hazard within the Bamenda municipality (Nyambod, 2010). In the field, 75% of the responded indicated that they have experience the occurrence of landslide mostly during the rainy season that is within the month of July and September with rainfall varying between 340mm to 450mm. landslide in Bamenda is thus provoked by rapid urban development resulting from progressive occupancy of steeper slops adapted by cutting terrace-like areas and redistributing materials to provide building site [NDI]. Heavy rains tend soak and dislodge large rocks masses sometimes resulting in the complete crushing or burial of entire housing unite. Respondents identified landslides and land subsidence to be more common in Abangoh and Sisia quarters while flooding was seen to be more common in Mulang and Ngohmgham quarters.

To identify environmental problems, a number of respondents responded positively, Bamenda municipality has since been witnessing environmental challenges as a result of rapid

urbanization in the area with 84% of respondents who agree that because of the increase in birth rate and inflow of many people in the area, many things have changed within the natural environment like loss of biodiversity, land degradation, constant floods and high increase in land pollution. Many things have change including prices of agricultural goods and recreational facilities has promoted rural exodus in the study area while only 5% disagreed that there is no environmental challenge. According to field survey, environmental disorder is the order of the day in the Bamenda municipality to the extent that 11% did not decide anything as concerns environmental challenges in the study area.

2.6.2. Identified Environmental problems

a) Increase in pollution

The increase in traffic also lead to an increase in pollution, especially burning of this household waste in strategic quarters of Bamenda-nkwe. Since most of the indigenes do not empty dirt's in their bin. However, this only contribute a little as compare to dump abandoned in public places over the town. The problem of waste mismanagement in the Bamenda municipality is alarming as the whole town is now saturated with dirt. This increase in waste is as result of increase in urban population and household consumption which causes additional types of pollution. Thus, urbanization and level of pollution are closely linked to each other.

Source: Photos by Jecenta, 2023

Plate 2: Abandoned waste in Ntamulang market and Sisia quarter

*A show accumulated waste abandoned by resident of Ntamulung while **B** shows a market beside the accumulated waste   and **C** shows a house house beside the market and the waste, photo **D** shows waste dump in and escapement while **E** shows waste dump at the road side*.

Photo 3 present abandoned waste in the Sisia market while plate L present the burned waste in the Upper Sisia quarter and photo 5 also present abandoned waste around the mile 4 park. The situation in the Sisia Market is a serious called for concern as waste has occupied the whole market. Those whose shops are closer to the dirt constantly wear facemasks to avoid inhaling odor from the waste which often threatened the life's of residents Different types of waste was identified during field observation as seen in figure 13

	Solid waste	Liquid waste	Non-biodegradable waste	Biodegradable waste	Mixed waste
Series 1	32	5	40	10	13
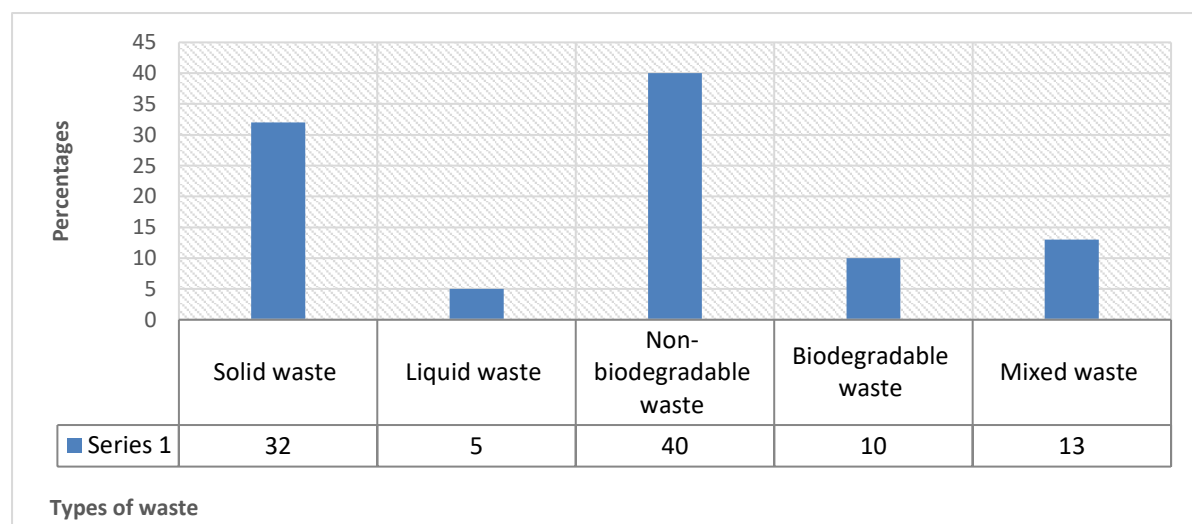
Source: Field work, 2023

Figure 13: different types of waste found in the Bamenda municipality

More than 40% of waste found in the study is non-biodegradable. This explains why the whole town is saturated with waste since this type of waste cannot be transformed for this reason people are forced to burn it in other to free the town and which in return brings more harm than good as the town is seriously polluted. As shown in figure 19, only 5% of liquid waste is produced in the Bamenda municipality reason being that Bamenda town is not an industrial area. Thus, Bamenda town is highly characterized by pollution as a result of different types of waste in the urban area. Solid and liquid waste are poorly disposed of and sometimes along the roads and around river banks and courses. This is the case along the mile 4 park road where solid waste is disposed along the road in the bridge behind the park. Environmental health is a major concern to institutional and municipal authorities as waste have to be properly managed in a bid to prevent the spread of diseases. Dumping waste on the street is an environmental mistake as such neighborhoods suffer from floods emanating of the disposed waste. The data obtained from the field on pollution, floods and other aspects of environmental problem is presented on table 14.

Table 14: Environmental challenges

Quarters	Municipalities	Effective respondents	Some environmental problems			
			Floods	Pollution	Portable water	Others
Abangoh Ntangang	Bamenda I	8	2	4	2	0
Bamenda-nkwe		20	4	10	5	1
Mulang	Bamenda II	17	3	7	7	0
Lower ngomgham		50	4	32	11	3
Ntamulung		25	3	13	7	2
Sisia 1	Bamenda II	7	0	3	3	1
Sisia 2		18	3	11	5	0
Mbefi		5	0	5	0	0
Mbesoh		2	1	1	0	0
Total		152	18	86	37	7
%			12	56.5	24.34	4.6

Source: Field work, 2023

b) **Loss of agricultural land**

Loss of agricultural space is one of the main effects of urbanization in the Bamenda municipality. Respondents in some selected quarters during field investigation 4.6%, accepted that Bamenda has witness a loss in its biodiversity and agricultural farm land in particular. Places that urban agriculture was practice is gradually being cover up by human settlement

indicated by one of the respondents. This alone has affected the prices of farm produce negatively as prices of these commodities has increase, he continued to say. A greater proportion of respondents in the urban area confirmed that prices of food stuffs have basically increase as compared to the previous years. Others said that, sometimes the food stuffs are not even available in the market which clearly mean that food stuffs are not only expensive but also scarce. Plate 3 shows human construction of houses in lands that were previously use for agricultural purposes.
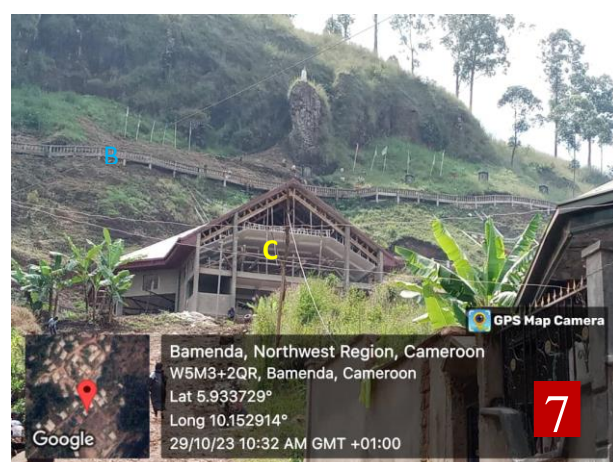
Source: Photos by M.M Lukong, 2023

Plate 3: Loss of Agricultural land in Abangoh

A shows houses found in Abangoh in bushes, B shows a slope were agriculture is practiced in Abangoh and C shows uncompleted building

Photo 6 shows loss of agricultural space in some urban sprawl areas of Abangoh Ntangang and Abangoh being replaced by buildings. Photo 7 present ongoing construction of a church. This expansion of human settlement is as result over population in the Bamenda municipality. It was also observed that only people with low-income rate settled in these areas because they could not afford land in the urban centers. However, field results show that, this expansion do not only lead to loss in agricultural land but also it cause land degradation as the few lands are over cultivated and overgrazed which exposes the soil to erosion and the end results being land degradation. One of the respondent in Abangoh Ntangang also indicated that stones are being extracted from the hills of Abangoh Ntangang for construction purposes. All these listen above have caused serious environmental damages confirming the fact that rapid urbanization process in the Bamenda municipality has environmental challenges.

c) Floods

Floods in Bamenda town generally come as a results of poor waste management where most of the waste like bottles or plastics are washed to the water bodies where they block water passages and water cannot flow smoothly, this water runs out of tract and the end results being floods. Also, floods in Bamenda are as result of poor construction of runoff channel. Most runoff in the Bamenda are narrow which makes it difficult for water to flow. The plate below shows flood in mile 4 bridge and the poorly constructed water channels.

Source: Photos by J.Bakah, 2023

Plate 4: Flood in Mile 4 Bridge and Poorly Constructed water channel

A shows accumulated mud in Mankon quarter and B shows flood while C shows runoff in the same zone

The plate above shows how rain water covered the mile 2 bridge making it difficult for people to cross and the poorly constructed runoff in the Bamenda neighborhood.

Increased episodes of flash floods, climate variability is also reflected in the instability of seasons. While it was hitherto possible predict periods of heavy rainfalls, today it is more complex to master the behavior of different climate parameters. Statistical examination revealed that annual rainfall in the city of Bamenda experienced a break in 1958. This break buckled the wettest decade of the series. After three decades of worsening, rainfall is experiencing rising since early 1990. The average profile of the annual distribution of rainfall shows a concentration of over 53% in 03 months (July, August and September). During these three months, rivers of the city know their flood flows and population in the valleys are

affected. The analysis of annual number of rainy days shows a downward trend and an increase of extreme rainfall event frequency (>50mm in 24h).

 It is also apparent that more and more years are experiencing erratic distribution of their precipitation. Then, the perception of is significantly reduced, as only 12% of the population affirmed that there is floods in the Bamenda as shown in table 18. However, subsistence activities are also affecting and development is facing new subtleties. Conclusively, the rainfall experienced strong variability in the town of Bamenda. This situation reinforces the risk of flooding by increasing flood water and increasing the vulnerability of population. The photo 10 and 11 below shows flooding in some Abangoh and abandoned houses in some flooding areas of the Bamenda.

| Source: Barka, 2022 | Source: photo by Fonki, 2023 |

Plate 5: Flooded Houses and Abandoned houses in Abangoh

*A shows flood in Abangoh and **B** shows an abandoned house while **C** shows and* abandoned house in Abangoh

Photo 10 shows flooding areas of Abangoh central and photo 11 shows abandoned house in the same areas due to the flood frequency. Although these hazards originate from natural systems and mechanisms, anthropogenic modification spearheaded by urbanization have reinforced the frequency and magnitude of certain hazards like flood. Field observation revealed that flood prone settlements frequently experiences landslides especially those located down slopes. This requires huge financial investments to ensure slope stabilization given the hilly and undulating nature of the relief.

d) **Landslide**

Landslide is fast becoming one of the major environmental problems in Bamenda which comes about as a result of rapid urbanization. Landslide is seen to occur in the heart of the rainy season that is from the months of July to September with rainfall varying between 340 mm to
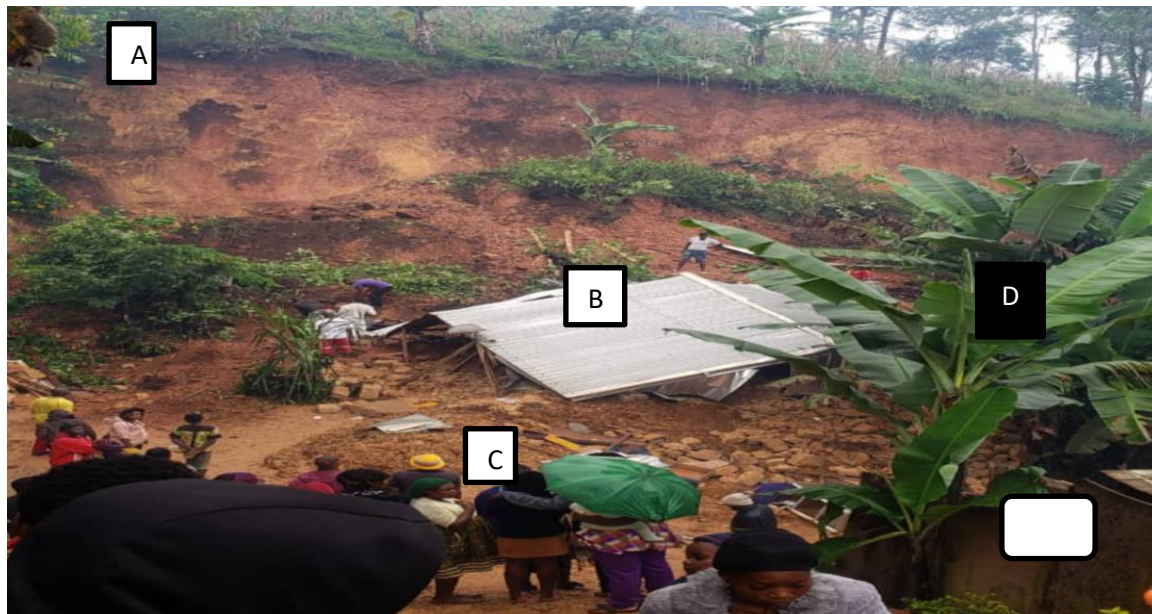
450 mm. Landslide in Bamenda is thus provoked by rapid urban development resulting from progressive building sites. Heavy rains have the tendency to soak and dislodge large rock masses sometimes resulting in the complete crushing of house leading to massive dead. Mean values were used to represent the results obtained from questionnaires that were administered to the 15 randomly selected household in each of quarters sampled.75% respondents identified landslide and land subsidence to be more common in Abangoh and the Sisia quarters. On September 2020 landslide occurred in sisia killing at least 29 people as shown on the photo 12 below

SORCE **; observer /2020 landslide at sisia**

Photo 1: Landslide in sisia II

A *show an escarpment where the land slide occurs, B shows a house affected by the landside, C shows the population observing the landslide and D shows plantain trees and a hut*

2.6.3 The mystery behind Natural Hazards

The natural environment of Bamenda has been over-stressed as a results of high population pressure on land. Environmental hazards provoked by rapid urbanization do not show signs of warning before their outburst. They are all too sudden and their impact on the inhabitants living within and without its area of occurrence cannot be underestimated. The first

few days of the month of August that is 4th to 10th August 2009 were characterized by sporadic outburst of natural environmental hazards within the city of Bamenda (Nyambod, 2010). Environmental experts will be quick to say that Bamenda had exceeded its carrying capacity. Geologists and Geographers will definitely have their own side of the story. There has been the percolation and progressive upwelling of soil top layer due to water accumulation from heavy rain.

2.7 Conclusion

Hypothesis 2 state that the uncontrolled urban development process in Bamenda has been affecting the environment negatively". While the negative factors like loss of agricultural space, pollution, floods and landslide also count in explaining urbanization challenges in the Bamenda municipality. In order to verify this hypothesis, data on respondents view was used. A greater percentage of the respondents in the field answered yes with 75% of the respondents standing on the view and 20% of the respondents in the field rejecting the view while only 5% of the respondents stood on the view for no idea. But from all the responses, uncontrolled urban development and rapid urbanization in the Bamenda are largely responsible for environmental problems in the study area.

More so, reduced agricultural, pollution and landslide has also played a very big role as urbanization challenges in the Bamenda municipality is concerned. Agriculture in the study area that was usually done in large scale to feed the population of the study area, has been reduce for past two decade now as urbanization process keep increasing. Most of the respondents said that land that was always used for the cultivation of various types of crops has been reduce due to increase population which has necessitated the demand for housing in the study area.

Research hypothesis 1

Research hypothesis 1 guided the study to collect relevant data to establish a link between urbanisation and some related environmental challenges. That is, how the level of urba n growth has led to some environmental challenges which are actually affecting sustainable urban management in the town of Bamenda Town. Table 15 of the work was exploited to verify our stated hypothesis.

Table 15 Data on pollution, floods, loss of biodiversity

Quarters	Effective resp.	Some environmental problems			
		Floods	Pollution	Portable H2O	Waste
Abangoh Ntangang	8	2	4	2	0
Bamenda-nkwe	20	4	10	5	1
Mulang	17	3	7	7	0
Lower ngomgham	50	4	32	11	3
Ntamulung	25	3	13	7	2
Sisia 1	7	0	3	3	1
Sisia 2	18	3	11	5	0
Mbefi	5	0	5	0	0
Mbesoh	2	1	1	0	0
Total	152	18	86	37	7
%		12	56.5	24.34	4.6

Source: Field work, 2023

In a bit to establish the degree of relationship between variables, the rate of urbanisation and related environmental are exploited and a contingency table was developed and the null and alternative forms of the hypothesis were equally stated.

Table 16 The contingency table base on the chi square statistic

Observed value (O)	Expected value (E)	O-E	(O-E) ²	$\dfrac{(O-E)^2}{E}$
2	5	-3	9	1.8
4	5	-1	1	0.2
2	5	-3	9	1.8
0	5	-5	25	5
4	5	-4	16	3.2
10	5	5	25	25
5	5	0	0	0
1	5	-4	16	3.2
3	5	-2	4	0.8
7	5	2	4	0.8
7	5	2	4	0.8
0	5	-5	25	5
4	5	-1	1	0.2
32	5	28	784	158.8
11	5	6	32	6.4
3	5	-2	4	0.8
3	5	-2	4	0.8
13	5	8	68	13.6
7	5	2	4	0.4
2	5	-3	9	1.8
0	5	-5	25	5
3	5	-2	4	0.8
3	5	-2	4	0.8
1	5	-4	16	3.2
3	5	-2	4	0.8
11	5	6	32	6.4
5	5	0	0	0
0	5	-5	25	5
0	5	-5	25	5
0	5	-5	25	5
1	5	-4	16	3.2
				$\sum$ 259.34

Source: Table 22 based on Chi square statistics

$$x^2 = \frac{(O-E)^2}{E}$$

Chi square value = 259.34

Degree of freedom (df)= (c-1) (r-1) = (4-1) (9-1) =3×8 = 24

Null Hypothesis (Ho): The rapid rate of urbanization in the town of Bamenda have not negatively affected the urban environment to sustainable urban development.

Alternative hypothesis (Ha): The rapid rate of urbanization in the town of Bamenda is negatively the urban environment to sustainable urban development.

We now have our chi square statistic (x^2 =259.34), which is the calculated value, our predetermined alpha level of significance (0.05), and our degrees of freedom (df =24). Situating the Chi square distribution table at 9 degrees of freedom and reading along the row we find that the value of x^2 (259.34) is above the critical value 36.415. Since our calculated value of x^2 = (259.34), is far above the critical value of 36.415, we can then reject the null hypothesis that; The rapid rate of urbanization in the town of Bamenda have not negatively affected the urban environment to sustainable urban development and retain the alternative which states that; The rapid rate of urbanization in the town of Bamenda is negatively the urban environment to sustainable urban development.

CHAPTER 3

THE SOCIO-ECONMIC IMPLICATIONS OF SUSTAINABLE URBAN MANAGEMENT IN BAMENDA TOWN

3.0. Introduction

Over the years, the town of Bamenda has witnessed a significant change in its size, spatial growth. This change is due to increase urbanization resulting from in-migration and natural increase. This is accompanied by increase pressure on land especially in concentrated places like commercial areas, and other urban for reason purpose of engaging in economic activities with the end results being urban challenges. Based on the temporal delimitation of this study, four time period showing the evolution of urban challenges have been examined to show how urban challenges have evolved over time. These periods (1973, 1990, 2010 and 2023) were chosen based on the two master plans of the town (1985 and 2012 master plan respectively) that fall within these time periods. This chapter therefore, examines the manifestation of socioeconomic challenges, the spatial evolution of socioeconomic challenges, characteristics, forms and measurement of urban challenges and how these socioeconomic challenges have affected the people over time in the Bamenda municipality.

3.1. Manifestation of Socioeconomic and Spatial Evolution of Urban Challenges in the Bamenda Municipality

Generally, the world's population is in continuous growth especially that of the developing countries. Cameroon particularly is experiencing rapid population growth especially in urban areas which has implicated urban problems. The urban population was 18% in 1967, 22% in 1976, 40.1% in 1991 and presently, it is estimated at 51.5% (BUCREP,2010). The case of Bamenda town is very peculiar with a very high growth rate. Bamenda has experience spectacular increase in its population for the years. The national census on population and housing census of the 1976-1987 in Cameroon revealed that Bamenda was ranked 4th with a 7.8% average annual growth rate amongst the town of 1000 inhabitants and 5th between 1987-2005 with average annual growth rate of 4.9% amongst towns of more 50000 inhabitants (Ngoran, 2013).

As of the moment, Bamenda urban space has a population of 269530 people and a surface area of 22.5km2 with population density of 718p/km2 (BUCREP, 2010). This high population pressure is attributed to a number of factors which are; high fertility rate, early marriages very common among teenage (17-18years) who start child bearing at the age of 19years (Nkwemoh,

1999). Family planning education and the use of contraceptive is slow. The culture, custom and tradition of nursing children for wealth and reduction in infant mortality due to improved medical facilities explains this increase in population growth which leads to urban challenges in sub areas and Bamenda municipality as a whole. Table 15 shows the trends of population growth in Bamenda municipality since 1976.

Table 17: Evolution of population in Bamenda urban space between 1976-2005

Municipalities	1976	1987	2005	2030 projection
Bamenda I	3368	7710	18468	38250
Bamenda II	28385	64984	159210	261285
Bamenda III	16358	37448	91852	105244
Total	48111	110142	269530	404778

Source: BUCREP, 2005 census and 2010 projections

Table 15 shows the evolution of Bamenda population from 1976 to 2005 and 2030 projection. From the table, the increase in population has become a call for concern. Since 1976 a population of about 3368 was registered and within 1987, a population of about 7710 was registered giving a way to the 2005 population of 18468 which we experience a tremendous increase leading to urban challenges and is still projected to increase by the year 2030 to 38468 inhabitants which is a clear indication that urban challenges will also increase if care is not taken.

3.2. Challenges to Sustainable urban development in Bamenda from 1973-2023

3.2.1. Population Growth

   Rapid population growth in Bamenda due to natural increase and in-migration is seen as one of the factors responsible for urban problems in the town. Results from the first official population and housing census conducted in Cameroon in 1976 revealed that, the population of Bamenda was 48111 inhabitants with an average population growth rate of 7.8%. While the second official population and housing census of 1987 gave Bamenda a population of 110142. According to the results of the 2005 official population and housing census, the population of Bamenda was 269530 with a population growth rate of 4.9% (BUCREP, 2005). Since 2005, no official population and housing census has been conducted in Cameroon and as such, the population has be projected up to 2035 during which Cameroon is expected to emerge based on the 4.9% growth rate as seen on (Figure 14).
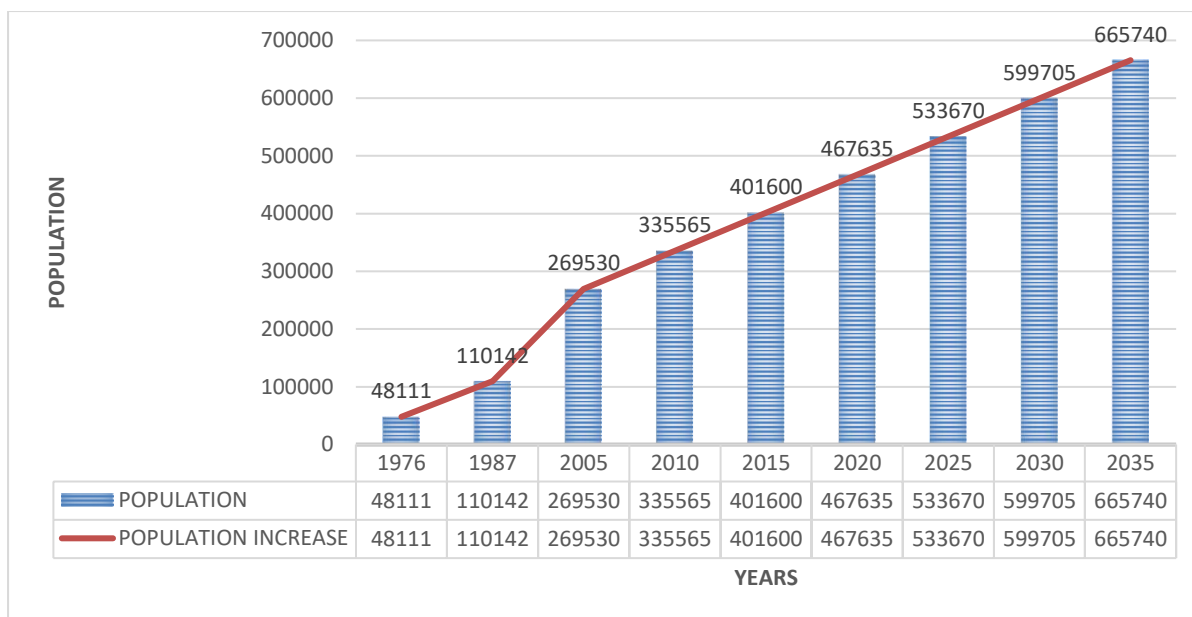
Source: BUCREP 2005 and Population Projection (2005-2035)

Figure 14: Urban Population of Bamenda town from 1976-2035.

Figure 14 shows that, the population of Bamenda town has been on general increase from 48111 to 665740 people with a net population growth (natural increase plus net migration) of 617629 people (665740-48111) between 1976 and 2035. Such a significant increase in population has increased pressure on land, forcing some people especially arrivals to occupy risky zones in a haphazard/uncontrolled manner.

3.2.2. Political Dynamics

The political dynamics in the status of Bamenda from 1973-2023 has also contributed to increase in urbanization and consequently to urban problems in Bamenda. The change in the status of Cameroon from federal to a unitary state through a referendum in 1972 brought great changes in Cameroon and Bamenda in particular. With the creation of the unitary state in 1972, the Bamenda Town Council (Mankon Area council) was changed to Mankon Rural Council. In November 1977, the status of the council was raised to an urban council. This brought significant infrastructural development like roads linking the Central Business District (CBD) and residential quarters like Musang, Ngomgham, and Azire. This attracted more people into the town leading to urbanization and eventually, the habitation of ecological fragile areas like the hill slops of Sisia and the swamps of Ntamulung (urban problems).

Equally, the presidential Decree of January 2008 which upgraded Bamenda from an urban to a city council contributed to the increase urbanization and subsequently urban problems.

This brought significant changes in terms of infrastructural development like roads (the tarring of the below Foncha-Ngomgham road, Musang-Ngomgham and the extension of pipe born water and electricity to quarters that lacked these facilities (for example Bangshie and Ntahnka). These facilities attracted more population into the town opening flood gate for uncontrolled urban expansion.

Beside the change in the status of the town, the Anglophone crisis that started in 2016 also brought a significant change in the population of Bamenda. This led to an increase in urbanization and eventually urban problems. Prior to the crisis, Bamenda being the head quarter of the northwest region of Cameroon, acted as a receiving town to those that leave the interior villages in search of work, educational opportunities. The crisis forced many people from the region to Bamenda due to insecurity. These crises attracted many people into leading to increase in urbanization. This increase in urbanization resulted to uncontrolled expansion of the town into ecologically fragile areas.

3.2.3. Economic Factor

Commercial activities and to a lesser extent agriculture and light industrial activities have been the major economic activities that have significantly contributed to increase urbanization rate and urban problems in Bamenda. Bamenda town is the major commercial center of the North West Region. The town had three markets and one shopping center (CBD) in 1985 (1985 Bamenda master plan). Today, there are 7 daily markets (Bamenda Main Market, Nkwen market, Ntarkon market, Bali Park Market, mile 4 Nkwen Market, Mbengwi Park Market and Mile 8 Mankon market). This has attracted a lot of people who are interested in commercial activities into the town. Apart from commerce, agriculture is carried out in the wetlands like Musang, Mulang, and Ngomgham while processing industries include, metal works, soap industry and furniture workshops. Financial institutions like Banks and micro-finance institutions are also growing in Bamenda. These activities are population pull factors and as such contribute to urban problems.

3.3. Population characteristics of Bamenda Town

3.3.1. Level of Education

A consideration variation in the level of education exists in the study area. This is stratified into 4 groups; uneducated formally, primary education, secondary education and higher education levels (Table 18.

Table 18: Education level of respondent in the selected quarters

Municipalities	Quarters	Effective resp.	Sectors of economic activities			
			Primary	Secondary	Higher Edu.	Uneducated
Bamenda I	Abangoh Ntangang	8	2	2	4	0
	Bamenda-nkwe	20	4	10	5	1
Bamenda II	Mulang	17	3	7	7	0
	Lower ngomgham	50	4	11	32	3
	Ntamulung	25	3	13	7	2
Bamenda II	Sisia 1	7	0	4	3	0
	Sisia 2	18	3	5	6	2
	Mbefi	5	0	0	5	0
	Mbesoh	2	1	0	1	0
	Total	152	18	52	65	8
	%		12	34	42.76	5.2

Source: Field work 2023

Those who had attended higher education made up a greater proportion of respondents in the selected areas (42.76%) followed by the secondary education level (34%). Such a high proportion of those in the higher and secondary levels can be justified by improvement in literacy level due to increasing creation of private universities and the University of Bamenda and also the creation of many secondary schools in Bamenda today. Uneducated people had the lowest number of respondents (5.2%) followed by primary education (12%). Primary educational level is slightly higher because many people go through primary education in this generation as compared to the past. However, a majority of those with low educational level are more vulnerable to urban problems as was discovered during field work. This is because these people have limited knowledge and poor perception on urban problems. According to many of them, they aid less than 50000frs a month as they mostly work in the informal sector while some practice agriculture especially residents of lower Ngamgham and Abangoh Ntangang.

3.3.2. The Rate Formal jobs and Informal jobs

The types of jobs were divided into informal and formal jobs operated by most of the youths in the town of Bamenda. It was important therefore; we classify these jobs to understand appropriately elements of job creation in heaven (Figure 15).
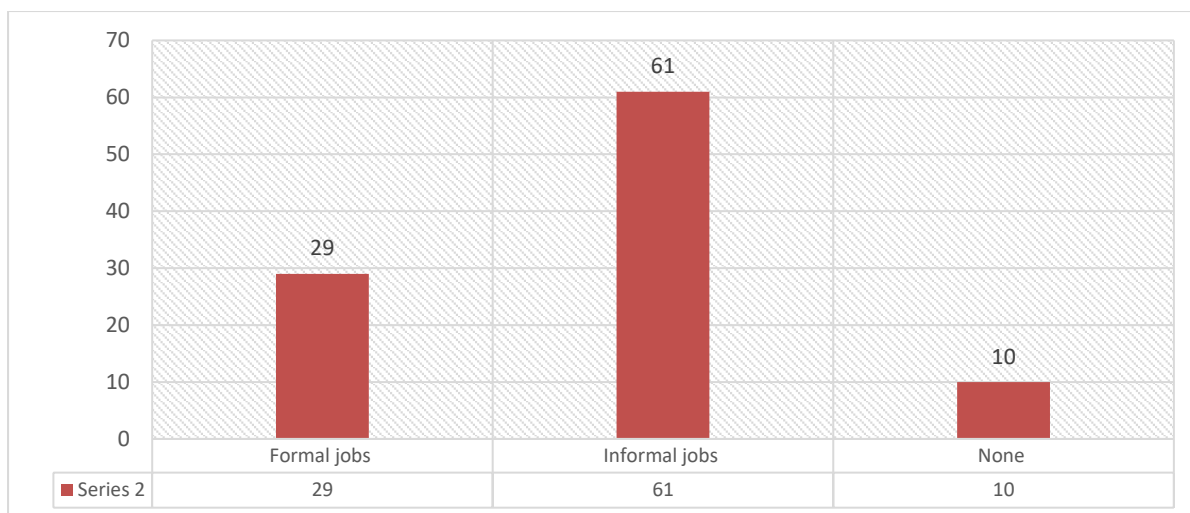
Source: Field work by, 2023

Figure 15: Cumulative Responses on informal and formal jobs in the selected quarters

A greater proportion of people in the Bamenda municipality do informal jobs (90%) as against 29% who do formal jobs. And 10 percent to whom have no jobs. This is because of limited formal jobs in the town of Bamenda. These people working in the informal sector are considered to be underemployed, Tufoin (2020) writing on motorbikes in Fundong Sub-division, defined underemployment as a condition in which people in a labour force are employed at less than full time or regular jobs or jobs inadequate to their training or economic needs. The same situation can be witnessed in Bamenda town as many youth who leave their quarters in the morning to go hawking along major market in Bamenda while others engaged in commercial bike riding as seen in (Plate 6).
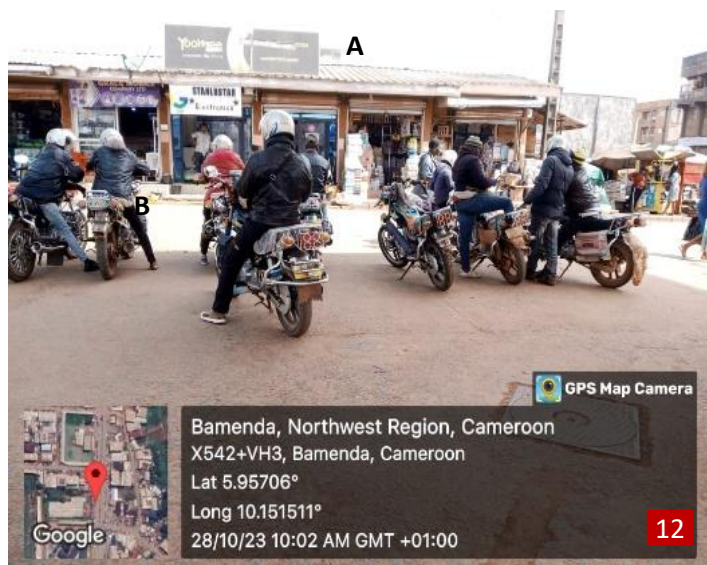
Source; FONKI, 2023
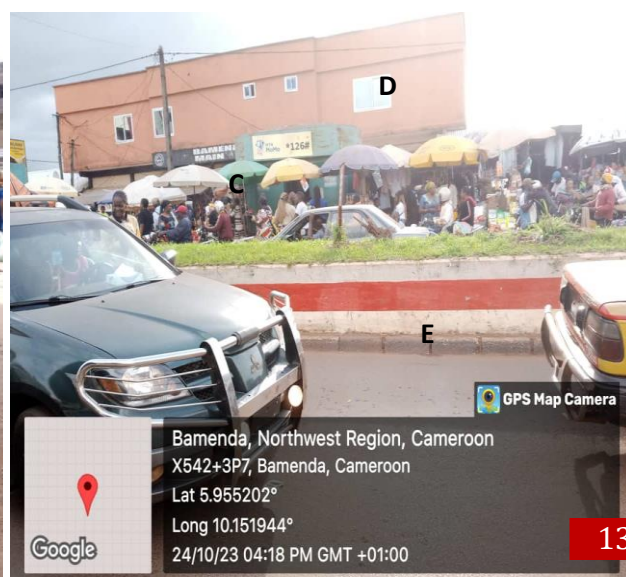
Source; FONKI, 2023

Plate 6: Commercial bike Riders and Hawkers in Bamenda-Nkwa

A shows a market ,B shows bike riders, D shows a shopping mall , C Shows retailer's and hawkers in the market while D shows a roundabout in Bamenda Nkwe

Photo 12 shows motorbike riders in the Bamenda urban area waiting for customers. Photo 13 demonstrate how youth are in the street of Bamenda hawking different types of goods. According to field surveys and investigation, it was found out that hawking and motorbike riding create employment to both educated and uneducated young people in the Bamenda municipality. The phenomenon of unemployment in Cameroon keeps increasing paving the way for the proliferation of the informal sector in the country.

3.3.3. Employment rate and sector of employment

Employment was sub-divided into self-employed and unemployed. For those employed, sector of employment was either public sector or private sector (Figure 16).
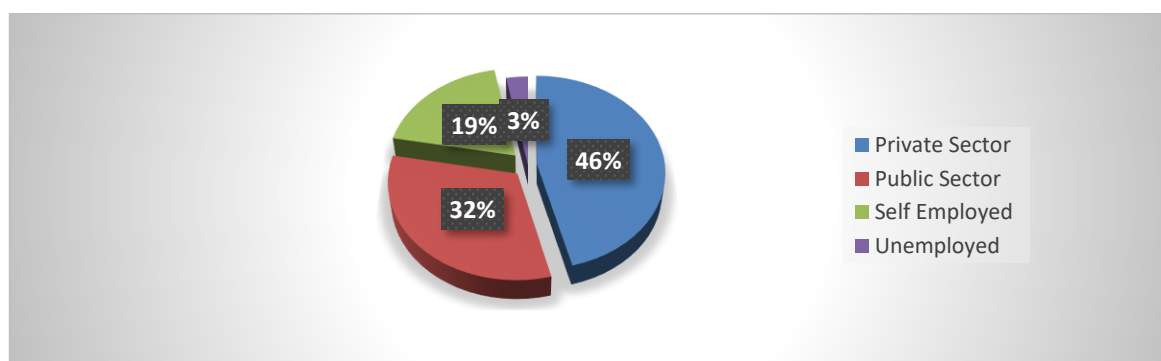
Source: Field work 2023

Figure 16: cumulative responses on employment rate and sector of employment

A greater proportion are employed in the private sector (46%) against (32%) in the public sector with just (19%) being self -employed living the number of unemployed at just (3%) This is because, those who migrate to urban centers have the search for jobs as their paramount objective. However, a majority of those employed are in the private sector (46%) due to limited opportunities and specialized skills. Besides, a majority of inhabitants in these quarters are the working age group and due to low rate of employment in the Cameroon formal sector compared to the private sector reason to why only (32%) of inhabitants in the selected quarters worked in the public sector. Thus, urban challenges in Bamenda is highly witnessed by those in the private sector, those being self-employed and those who are totally unemployed have low income rate.

Majority of those in the private sector have secondary education and few having higher education. According to dwellers in Bamenda, they hardly visit the hospital when they are sick and that most of their children end their education at the level of the primary education and secondary schools. Some even went to the extent of saying that, they were going to parked out of Bamenda if the prices of basic commodities did not reduce. In 2005, unemployment rate was estimated at 15% of the active population compared to 6.7% in the 1987. For the past decades, it has been observed that the level of unemployment rises simultaneously with the level of education (Njie, 2016). In line with 12 interviews conducted with hawkers, motorbike riders and others in different sectors, 70% of them ascertained that they are underemployment because they have obtained the GCE A/L, Bachelor's Degree and Master Degree which does not permit them to be involved in these types of activities.

It is equally observed that the number of young graduates are in a gradual rise in the labour market reason why these type of activities is in a continuous increase. Contrary to the past decades, the actual unemployment rate since 2000 affects more and more degree holders (Kengne, 1991). About 500 Degree holders from higher educational institutions arrives the labour market every year and similar number is offered by secondary education with professional qualification in Cameroon (Njie, 2016). According to Kaffo (2006), when comparing the level of unemployment in Cameroon realized that unemployment has been on continuous increase. This study compared unemployment levels in line with the levels of education from the year 1987 to 1993 (Figure 17).
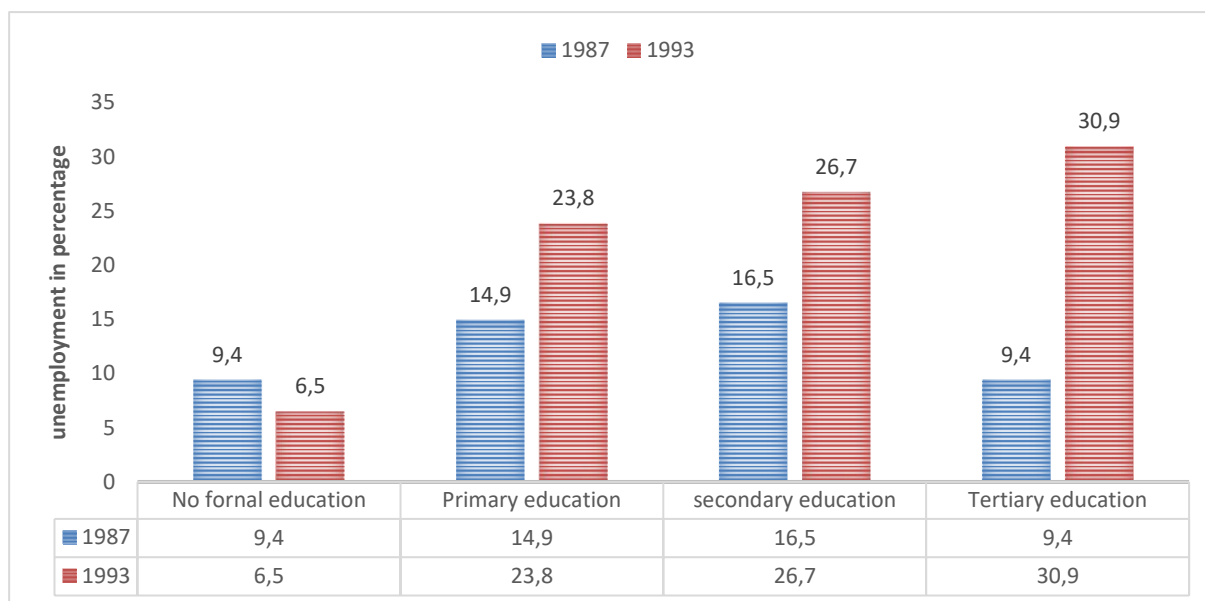
Source: Computed from statistics presented by Celestine (2006)

Figure 17: The unemployment level in Cameroon by educational levels 1987 and 1993

According to the author, the level of unemployment in Cameroon is on a continuous increase affecting those within the ages of 15 to 30 years constituting 57% of those seeking for jobs. This falls in line with the study which found out that most people that are unemployed in Bamenda falls within the ages of 15 and 30 which constituted the most of those seeking for jobs.

3.3.4. The State of roads and traffic within Bamenda Town

Inter-urban transportation is a common phenomenon in the Bamenda municipality. However, the activity is plagued by numerous challenges, ranging from traffic congestion, parking scarcity, car dependency. These problems are mostly common in central areas like Mobile Nkwen and Hospital Round About as presented in (Table 17).

Table 19: Effective respondents on crowdedness, limited space, traffic jam among others

Municipalities	Quarters	Effective resp.	Urbanization		Reasons			
			Yes	No	Crowd-edness	Limited space	Traffic jam	Others
Bamenda I	Abangoh Ntangang	8	3	5	4	1	3	0
	Bamenda-nkwe	20	11	9	9	4	6	1
Bamenda II	Mulang	17	8	9	4	7	4	2
	Lower ngomgham	50	38	12	27	11	19	3
	Ntamulung	25	12	13	13	8	2	2
Bamenda II	Sisia 1	7	2	5	3	4	0	0
	Sisia 2	18	10	8	6	11	0	1
	Mbefi	5	3	2	4	1	0	0
	Mbesoh	2	2	0	1	0	1	0
	Total	152	89	63	71	47	35	17
	%		58.6	41.44	46.71	30.92	23	11.81

Source: field data, 2023

As illustrated in table 19, crowdedness contribute greatly to the problem of road network in the Bamenda with largest proportion (56.6%), followed by limited space (30.92%), traffic jam taking 23% and the other taking 11.81%. After so much has been said concerning the poor road network in Bamenda and beyond, one is still hyping on the issues, as road users and car owners continue to cry foul about how they visit the garage more often than the church. The roads have not only turned to sing song but is now a call for concern in order to curb road accidents

Below are sample opinions of some individuals at the start of the dry season in Bamenda. A period considered to be dusty given the nature of the road.

"As a road user in the town of Bamenda, considering the state of the roads, it's by no means favoring us because just to navigate these roads is not easy. Potholes, stones, everywhere dust. This endangers the carat we use, I even frequent the garage more than I frequent the church because of bad roads"

"I don't know if we are evolving with time, look at our era considering globalization and our city roads are as such. It is embarrassing, as a Cameroonian I feel ashamed it's better to go on foot than use a car. The distance one needs to cover may be inconveniencing because of dust"
Emmanuel Tamanji

"I am very disappointed with the type of roads we have. It makes transportation very difficult, be it public or private. I visit the garage frequently because of these bad roads and it cost a lot of money. Health wise, the roads produce a lot of dust that makes many sick. I really hope our leaders can do something about these roads. No matter what is happening in town, we deserve good roads." he states devastatingly.

Below are some plates demonstrating the bad state of the roads and others showing the various problems caused by this bad roads in the Bamenda municipality.

Source: Photo by Fonki, J., 2023

Plate 7: Poor Road network and high traffic

*A shows the bad stage of the roads in the Bamenda municipality while **E** and **D** 16 traffic jam and the issues of waste management in open spaces in the town of Bamenda*

*While **B** and **C** shows how the people of Bamenda are crowded taking taxis and motorbikes. With building along the road side as demonstrated on the photos above, it is clear that people, vehicles and bikes*

Photo 7 also show how waste material have taken half of the road causing traffic jam in the town. It was observed that distances that should be covered in less than 30 minutes are covered for more than an hour because of the bad stage of the roads as seen in the photo 14 above. The road network is an additional source of expenditure to the vehicles users who most often take their vehicles for repairs in the garages daily. This has directly or indirectly increase the cost of living. To make matters worse, the increase in the cost of fuel in 2024 has influence the living condition of the population and most transporters transfer the increased cost to passengers by increasing transportation fares with disregard to prices fixed by the government which stands at 300FCFA during the day and 350FCFA during the night (Table 20).

Table 20: Traffic jam irregularities in the town of Bamenda

Occurrence of traffic jam morning rush hours				Traffic congestion evening rush hours		
Working hours	Frequency of traffic	Lateness	Time difference (l:ateness-working hours)	Time	Frequency of traffic	Delays
7:00	High	7:20	15minutes	2:00-3:00	High	High
7:30	High	7:50	20 minutes	3:00-4:00	High	High
8:00	Very high	9:00	60 minutes	4:00-500	Very high	High
8:30	Very high	9:30	60 minutes	5:00-6:00	Very high	Prolonged
9:00	Very high	10:00	60 minutes	6:00-7:00	Very high	Prolonged
9:30	Very high	10:05	65 minutes	7:00-8:00	High	High
10:00	High	10:40	40 minutes	8:00-9:00	High	High
10:30	High	11:30	30 minutes	9:00-10:00	Moderate	Average
11:00	Moderate	11:05	10 minutes	10-11:00	Moderate	Average
11:30	Moderate	11:03	5 minutes	11-12:00	Low	Non
12:00	Moderate	12:02	5 minutes	-	-	-
12:30	Moderate	12:00	-------	-	-	-
13h00	Moderate	13h00	-------	-	-	-
13h30	Moderate	13h00	-------	-	-	-
Total			370	-	-	-

Source: Field data, August, 2023

Table 20 shows that due to high traffic, workers frequency lost out some minutes, hours or even above of the work time which in most cases, they are being sanctioned by their proprietors. As earlier noted, these are consequences of mobility challenges that they have to pay. It is seen from the table that during the morning hours 7:00am to 7:30am traffic is simply being high but

from 8:00am it becomes very high since most people are the streets going to work. To this effect, workers loss up to an hour and more because of traffic jam. Similarly, during evening rush hours, it becomes high again, and very high between 4:00pm to 7:00pm or exceeds at times. So, inhabitants have to adapt to these knew trends to cope.

The absence of parking spaces, poor parking, inappropriate use of pedestrian's pavements and the non-respect of traffic regulation only complicate the situation further as clearly seen in plate E and F above. The road infrastructural development within the city has not been sustainable enough to sustain the economic activities or transportation demands of the growing population. These roads are deplorable in such a way that they have been reduced to patches of tarred surfaces.

According to the respondent's responses, this waste make more than months before those in charge of collection come to collect it. Since the termination of HYSACAM contract in 2018, the problem of waste deposited in Bamenda municipality have been a call for attention for this reason abandoned waste is found all over the town including market places. During an interview with the head of council development for Bamenda II, he made it clear that the city mayor has made matters worse as they are not allowed to collect daily tax from those selling in public places which in return makes them to have limited resources to engage in all activities with the council area which also include dump collection. He went further to say that decentralization has not fully taken place which make the Mayors of Bamenda municipality not to fully execute their yearly projects. To him, the amount of cabbage in town is a result of limited resources to fully engage in its collection. Table 10 below shows the frequency of cabbage collection in the Bamenda

Table 21: The frequency of cabbage collection in the Bamenda

Municipalities	Quarters	Effective resp.	Frequency of waste collection			
			Very often	Hardly	Once a week	Rarely collects
Bamenda I	Abangoh Ntangang	8	0	1	2	5
	Bamenda-nkwe	20	3	3	4	10
Bamenda II	Mulang	17	1	2	3	11
	Lower ngomgham	50	2	6	9	32
	Ntamulung	25	2	13	7	3
Bamenda II	Sisia 1	7	0	4	3	0
	Sisia 2	18	2	5	6	3
	Mbefi	5	5	0	0	0
	Mbesoh	2	0	0	1	1
	Total	152	15	34	33	60
	%		9.86	22.4	21.71	39.47

Source: Field work, 2023

From to table 21, the frequency of waste collection within the Bamenda municipality is very low as companies involved attribute only 9.86 effectiveness role. Waste stays in the dump sites for weeks, months and rarely collected in some cases. This alone says why the whole town is saturated with waste material of all categories like liquid and solid waste though the town is mostly dominated by solid waste.

3.3.5. The Challenge of portable water

One resource that has a direct bearing on human community sustenance is water for the multifunctional role it plays in human metabolism and ecological dynamics equilibrium. Water development should make it readily available in too much or little amount. The western high Lava Plateau is reported to be a high population cluster and one of the highest population density areas in Cameroon since independence in the 1960s for reasons of a long dating civilization and soil fertility among others. Most Cameroonian towns are only faced with water scarcity especially during the dry season with Bamenda Municipality not being an exception. According to field investigation, the issue of water crisis became worst in the Bamenda municipality when the Anglophone crisis took a different dimension in 2018. Because of this crisis, so many water projects and water catchments were abandoned. During an interview with the Head of Urban development in Bamenda II, he made it clear that the council was building a water catchment in Mankon that could supplied the whole of Bamenda with water but because

of the crisis, the project was abandoned. Below are some plate of abandoned water catchment in Bamenda.

N*Sources: photos by Fonki, J., 2023*

Plate 8: Abandoned water catchments and residents

A shows abandoned house, and B shows a water catchment while C shows a bore hole in Alakuma

Photo A,B and C shows the abandoned water projects in the Bamenda municipality. This had led to a serious problem of water shortage within the council areas. People now trek long distances in the early hours of the morning in search of springs. Many go to the extent of digging bore holes in their homes to supply them with water. The photo below show a stream arranged by the people of Sisia to supply portable water.
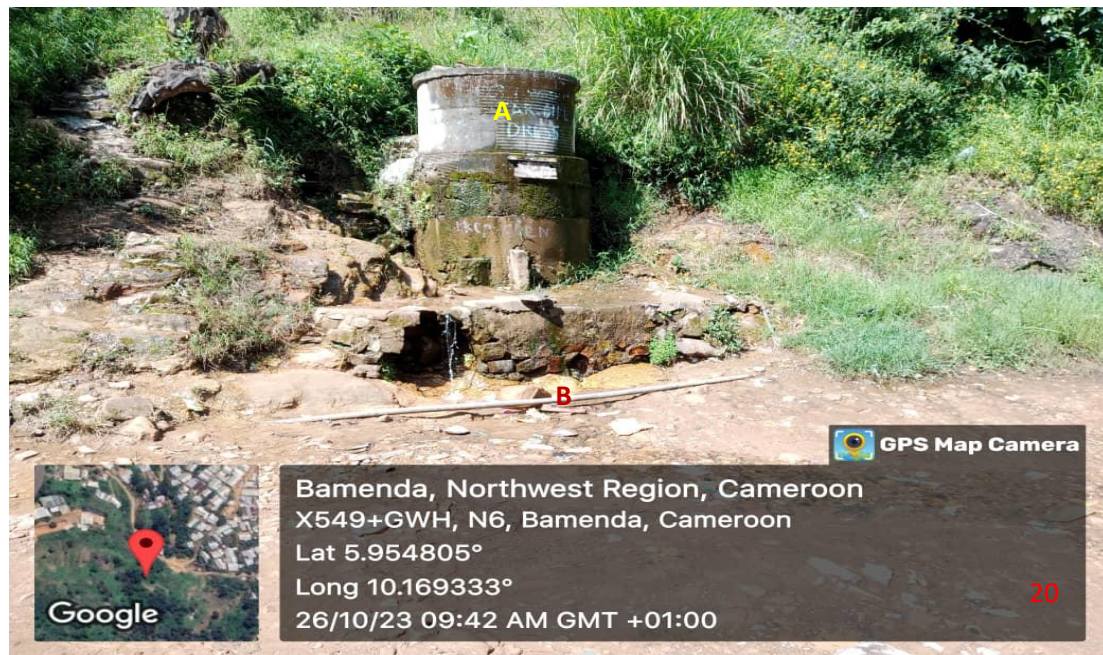
Source: Photo by FONKI, J., 2023

Photo 2: Stream in Sisia serving as Portable water

*A shows an abandoned and broken water catchment while **B** shows and exposed pipe beside the water catchment.*

3.4. The effects of the socio-political crises on sustainable urban development

Higher level radicalism is being observed as the youth and other segment of the population engage in more or less guerrilla warfare as the crisis continue. No form of economic venture nor any meaningful development can survive in the face of such conditions. In particular, the army that used to be a symbol of national pride and highly respected is now being confronted on regular basis. Other security services have to work 24/24 to keep the momentum and gain the necessary authority it once had. Given the disconnection in the social fabric of the system, businesses have been paralyzed in the town of Bamenda. Apart from the Cameroon Development Corporation (CDC), UNVDA Ndop and a few other agro industrial plantations such as Cameroon Tea Estate, Delmonte Banana Plantation in the Regions, no major manufacturing company exists. Repeated call for *ghost town* has compounded the effort to make ends meet. According to the general manager of CDC over the famous CRTV radio programmed-Cameroon Calling on Sunday

August 5th, 2018, out of 11 estates in operation prior to the crisis, none is working normally. The report further suggests that all the rubber estates have been shut down, leading to the loss of 7000 direct jobs in rubber, over 5000 job loss in Banana and 4500 lost jobs in the Palm

sector. The few individuals who attempt to bridge the odds of the ghost town calls are met with the "weapon of fire" that has ravaged hundreds of business units in the two regions. At least 500 business entities have been damaged in separate locations in connection to the uprising, including but not limited to the burning of markets, shops, individual stores, taxi cars and other transport buses, just to name a few. Over 2000 residential houses have also been burnt down in more than 50 communities across the region according to the separatist spokesman.

The loss of lives that according to media report were in their thousands since the start of the crisis has serious social consequences on living in these two regions. The BBC Focus on Africa (2018) reports that in an interview with General Agha Robinson of the Cameroon army, over 1200 lives have been lost so far made up of separatist fighters and the security and defense forces. According to field observations, the more the separatists call for ghost town, the more potential lives are to be lost because the government is determined to combat them with the full force of the law. Lives lost can never be regained and the warring parties are advised to understand the value of human lives within the context of the bible principle of "thou shall not kill". In this respect, it is only God that has the power to give and therefore to take life.

Table 22: Variation in the industrial Characteristics before and during the crisis

Product/institution, variable	Year 2016	Year 2022	% change
UNVDA (tons of output)	2000	<5 tons	-99.75%
Budget of UNVDA			-40%
Effective labour force (CDC)	21,000	2,500	-88.1%
Cocoa production			-75%
GAICAM job situation			-6000

Source: Forbe and Vukenkeng, 2022

In specific terms, production of goods and services in the town of Bamenda have dropped by more than 75% as the main agro industries are almost completely paralyzed. At the CDC, bananas, palms, rubber and other cash crops have been abandoned to themselves with no possibility of short term revival. According to the General Manager of the Upper Noun Valley Development Authority (UNVDA) Ndop, output dropped from about 2000 tones to less than 5 tones in the harvest period principally because farms cannot be accessed due to road blocks and general insecurity. Individual productions have also fallen significantly as farmers have

abandoned their farms, reduced farming hours due to ghost towns, closure of rural financial institutions that has compromised producers" ability to seek for funding. As a consequence, the budget of UNVDA dropped by about 40% for the 2019 financial year. According to GAICAM, at least 6000 jobs have been lost as a result of the crisis. To summarize, Table 1 shows that all economic and social indicators for the two regions are negative. The Mutation Newspaper reports that at least 29 billion FCFA is required to revamp the Cameroon Development Corporation.

Persistent road blockade and ghost town calls have devastating consequences on the flow of goods and services and on income of businessmen and also on infrastructural development in the town of Bamenda. This is compounded by the burning of shops and associated killing of corporate personnels. Many teachers in private, lay private, confessional and religious schools have now gone for at least 24months without salary with threat to complete job loss as the sector finds it increasingly difficult to bounce back into business.

The security system and general governance of the two regions are on the verge of collapse. Administrative orders are openly violated by separatists who are trying to map out a state within the present day Republic of Cameroon. It is no longer easy to travel between major towns of the regions such as Kumba-Buea, Kumba-Mamfe, Mamfe-Bamenda etc for business. Traders have reportedly abandoned business trips to Nigeria resulting in empty shops. The level of risk that currently exists along these major cities is so high that no amount of profit can motivate people to undertake business trips. At least 50 cars have been burnt down and passengers kidnapped between Buea and Bamenda passing through Mamfe. So, travelling have been very challenging in and out of the town of Bamenda

Table 23 Consequences of crisis on the educational sector (sampled areas/institutions)

Variable	Year 2016	Year 2022	% change
Number of students Bamenda (Secondary education)	213,277	2,908	-198.65%
Registered students in The University of Bamenda	15,898	14,164	-10.91%
Students registered for GCE Examination (O/L & A/L)	138.000	130.000	-5.79%
% of students who passed the GCE examination (O/L & A/L)	74.84	54.60	-27.04%

Source: Forbe and Vukenkeng, 2022

Education is the sector that has suffered the most from the conflict as the separatists from the onset used education as a political tool to mount pressure on the state for political reform. Unfortunately, as the conflict was developing and changing forms, the ideology was hard to wipe from the minds of the fighters on the ground as kidnapping, killing and ransom request characterized the later stage of the conflict. Table 2 shows that enrolment in the basic and secondary education sector in the North West region alone dropped by 198.65% between 2016 and 2018. The performance of students at the GCE Examinations also dropped in terms of quality and quantity. Success rates at both the ordinary and the advanced level examination dropped by over 27% for the period under review. While the level of illiteracy, teenage pregnancy, household burden, and poverty have risen significantly because of no school, the future consequences on the economy as a whole cannot be underestimated. Armed robbery, stealing, settling of scores have also intensified within this crisis period.

While the short-term infrastructural damage in schools, roads and markets can be evaluated at over trillions of FCFA, the long term effect of such consequences is even far reaching. The persistent call for ghost towns and school boycott have increased the school dropout rate in the two regions by over 80%, increased crime rates by over 45%, alcohol consumption and drug abuse by over 35% though with diminishing income and income sources. It should be noted that the consequences of school boycott can hardly be evaluated in the short term. The long-term effect of no school in an economy is much more severe to include but not limited to fall in the supply of labour and consequences on output and economic stability, high crime wave, juvenile delinquencies, drug abuse, fall in taxable income, just to mention these few.

Social services have also broken down completely in some areas with the population being the victims. Water systems have broken down, electricity supply in many areas are no longer functional, health centers burnt to ashes and those in remote areas abandoned because of the fear of being caught in cross-fire or abducted for ransom. Many social services in rural areas are managed by institutions in other to meet up with the corporate social responsibility articles of their contracts. It becomes increasingly difficult to send staff for their upkeeps and proper maintenance. While the communities have sufficiently recovered from the three months internet shut down by the government, its effects on income and general welfare could not be underestimated as many start-ups depends on internet to do business and earn a living.

The effect of the crisis on the culture of the people cannot be left out. In some communities like Belo, for example, women had the opportunity to bury corpses for the first

time, in defiance of cultural and traditional norms. Traditional rulers considered as custodians of the tradition has been publicly attacked, kidnapped and taken ransom from. Some of them have been killed in the crisis, things that should not happen. There are over four hundred thousand internally and externally displaced internally displaced persons as a result of the crisis. Traditional rulers too have abandoned their chiefdoms/palaces for safety in other regions and towns of the country. This crisis has triggered a wave of forceful migration that the UN says is the fastest growing conflict in Africa.

Huge sums of FCFA have been lost in the two regions of the country. The North West custom department reported loss revenue of over 200million FCFA for the 2018 financial year alone. At least 90% of all the public contracts awarded in the two regions for the 2017 and 2018 financial years have not been executed or poorly executed. Contractors have abandoned machinery and equipment's because of threat or actual attacks from separatist forces. In this perspective, many farm-to-market roads that had to be rehabilitated were not. The crisis, it must be mentioned, has hit the rural areas much harder than the major cities of Bamenda and Buea where some degree of relative calm is reported. This has contributed to the falling total output of the two regions. Cocoa production from the South West region has particular suffered because of this as the farms are largely in remote and inaccessible areas.

The overall effect of falling output, dwindling income, deteriorating security conditions, distant governance, poor or no social services and no education on the general welfare of the population is huge. Meeting basic needs is now more of a luxury than necessity in the two affected regions of the country. Priority for many now is to be alive and not to be caught in fighting. Many households can no longer afford two square meals per day as a result of souring inflation driven by two key factors: fall in output as a result of fighting and inability to receive supplies especially of manufactured goods from other parts of the country due to regular road blockade. People now live to eat and not eat to live as it was in the past. The negative effect on poverty and hunger are immeasurable.

The crisis has presented the ugly side of social media as the separatists used it as their stronghold to pass information and to influence the population. Through the spread of false news, rumours and propaganda, the separatist based abroad succeed to influence the minds and actions of many of the youths based in the two regions. Photo shopping in part has been responsible for the deteriorating security conditions in the two regions as graphic images quickly moved the masses. This led to the band of social media through internet shut down in the two regions for at least 91 days. Liberty and freedom of the people was also severely

restricted as persistent curfews continue to be instituted by the government, blocking of borders and the band on motorcycle as a means of transportation in some major cities. All these made life unbearable for a majority of the citizens especially as unemployment had forced a good number of university graduates to depend on motorcycle transport for livelihood.

Contrary to the negative consequences presented above, the Anglophone crisis presents opportunities to other interest groups such as those who deal with arms and ammunitions. While the government has spent billions of FCFA to buy arms, equipment's, logistics and to maintain the army and security services on the ground, the separatists have also invested though not to the same extent on war facilities. Contractors supplying the government and separatists" movement, lawyers, and others have had direct share of benefit in the crisis. In fact, it created political jobs for others as the crisis saw the creation of the Commission for the Promotion of Bilingualism and Multiculturalism, The National Disarmament, Demobilization and Reintegration Committee as well as the appointment of two Anglophones for the first time to head the Ministries of Secondary education and Territorial Administration. It also paved the way for the opening of new schools especially of the common law system such as the Common Law Department at ENAM, and other state universities and the creation of the Common Law Bench at the Supreme Court of Cameroon.

The effects of these crises have been felt heavily on the sustainable development of the town of Bamenda. Structures such as, roads, taps, waste management have become very challenging in the town of Bamenda. In fact, life itself have been very difficult in the town of Bamenda since the crisis began in 2016. The government have not been able to concretely resolve the crisis in town and the town regions in general.

3.5. Conclusion

Hypothesis 1 states that "ill adapted urbanization process in Bamenda town is negatively affecting the socioeconomic life of the urban population in the town". To verify this hypothesis, data from respondent's awareness on the determinant of urban growth in the Bamenda municipality were analyzed. This was to determine whether socioeconomic challenges in the municipality are being caused by rapid population growth or whether other factors are involved in this urban challenges.

Further findings revealed that, urban problems are not only caused by rapid population growth in the Bamenda municipality but other factors are also involved. The outcome of the data

collected, treated, analyzed and interpreted revealed that rural-urban migration are the main determinants of urban growth which led to urban problems in the Bamenda municipality with the percentage of 62%, political factors with 15% and commercial factors with 23%. A majority of respondents with 83% responded positively that there is serious urbanization challenges in the Bamenda municipality. Also, 9% of the respondent did not even accept the phenomenon to be existing in reality and 8% of them did not answer anything or decide anything for their personal reasons best known to them.

 Moreover, characteristics of these socioeconomic problems in the Bamenda urban area was also discuss and how the urban dwellers are perceiving these problems as seen in the tables, figures, plates and photos. The next chapter focusses on the Environmental challenges of urbanization in the Bamenda municipality.

Research hypothesis 2

 This hypothesis attempts to establish a link between urbanisation and socio-economic challenges which are barriers to sustainable urban management in the town of Bamenda. Research hypothesis 1 guided the study to collect relevant data to establish a link between ill adapted urbanization process and socioeconomic challenges and the extent to which urbanization process is negatively affect the socioeconomic of Bamenda town. The urban population of Bamenda has witnessed a significant increase in its population over the years due to natural increase and rural exodus. This increase has greatly affected the people in terms of informal settlement, waste saturation, traffic jam, job scarcity and overcrowding, limited space and among others. In order to verify this assertion, the responses of the respondents were exploited (Table 27).

Alternative hypothesis (Ha): socioeconomic challenges in Bamenda town are of different types which results from weaknesses of urban laws and are caused by high birth rate and in-migration

Null hypotheses (Ho): socioeconomic challenges in Bamenda town are not of different types and are not caused by weakness of urban laws and high birth rate and in-migration.

CHAPTER 4

ALTENATIVE OPTIONS TO SUSTAINABLE MANAGEMENT STRATEGIES OF URBNA CHALLENGES IN THE TOWN OF BAMENDA

4.0 Introduction

Sustainable urban development and planning is very vital in achieving long lasting sustainable urban development. Urban planning is the process of anticipating, representing and regulating development in an urban area so as to ensure an effective and harmonious organization of the urban space through a master plan for a town aims at organizing urban space so as to create a comfortable environment for human settlement Kimengsi et al. (2017). The plan equally aims at demarcating land between private and public uses and carving out the location and extent of new development sites in the town. The sound implementation of urban planning regulations is thus, an effective tool to curb urbanization challenges and ensure the sustainable evolution of urban centers. However, Cameroon and Bamenda in particular faced challenges in implementation development policies as they mostly adopt foreign norms in implementing urban laws and development processes. This chapter therefore examines and analyses deficiencies and effectiveness of sustainable urban development strategies in the town of Bamenda.

4.1 The state of urban development strategies in Cameroon

Since in the days of the independence in the 1960, less attention was paid to the foreign policies of developing countries particularly in Africa and Cameroon particular. African countries are often working on tight financial constraints, most struggle to fund even a few embassies and lack skilled personnel and financial power to engage in various issues of international affairs. Because of the diversity of African nations, there is no single African foreign policy but many, portraying the varied national interests, weaknesses, strength and national histories. In some fields, African foreign policies exhibit great resemblances; in others they differ across critical cracks. Just as Russians, Britain, France and Americans do or might have dissimilar view of causes of threats in international relations; countries in Africa also differ, among themselves and with former powers, in their perception of risks and of how and what foreign policy areas should be focused on. The states in African are unquestionably aware of the pluralities that characterize their continent. Nevertheless, they have identifiable urban laws and foreign policy preferences and strategies. Africans perceive themselves as evolving a collective personality to protect their continents' international interest.

4.2 Urban law and use in the Town of Bamenda

African cities tend to be shackled to inappropriate, ineffective and redundant laws and policies for managing them. These laws run deeply through each country's social, economic and political systems and are often based on assumption that there is a strong national government that is able to implement them. For example, many urban land laws especially Cameroon and Bamenda in particular assume that the state has the capacity to manage long-term land registration systems. This is often not the case, resulting in legal uncertainty and vulnerability.

Over the past two decades especially, African countries have been urged to reform their urban policies, practices and laws in order to turn cities into more effective engines of economic growth and shift from an extractive to a more developmental and inclusive system of urban governance letting go of colonial urban policies since it has proven to be a failure in the African society as it is the case in the study area. Despite making global commitments to better urban management, few countries including Cameroon have made significant changes to their urban governance and land management legislation. In some cases, new laws have been written and finalized but not actually approved by relevant law-making bodies as it is the case in Bamenda municipality. Where new laws have been enacted, only a few have been fully implemented. This lack of productive change is partly due to the "export of regulatory rules and practices from major powers to weaker states" a practice that is common in international economic law but has spilled over into urban law because of urban law's importance in shaping property law. The view is often that if a country is to have an urban development and real estate sector that mirrors that of more developed countries, it needs to have those countries' laws, too. New urban laws may draw on international experience but should not be dominated by it. Cameroon lawmakers should rather focus on the context within which other countries' laws have worked: what were the political, administrative and legal factors in those countries that led to a particular type of law's success or failure? The answers to this question could reveal what might work in their context. Lawmakers should also consider the substance and principles of global commitments, and turn them into practical steps for improving urban law.

3.3 The Implementation of urban planning laws in Bamenda in view of the Master Plan

Urban planning in the Bamenda municipality like any other municipality in Cameroon is enshrine in good laws and regulations. The challenge always lies with the implementation of these urban planning laws. Urban planning after independence in Cameroon began in 1966

with the enactment of laws N0 66/10 of November 18th 1966 which laid down the urban planning code of the former east Cameroon and decrees guiding the implementation of these planning laws (law No. 66/10 of 18th November 1966). After the reunification of Cameroon in 1972, two major laws (1973 and 2004 urban planning laws) guiding urban planning in the country have been enacted which corresponds to the two master plans of Bamenda municipality.

4.4 The 1973 urban planning law and the first Master Plan of Bamenda town

To guide urban developments in Cameroon, the first law regulating urban planning in the United Republic of Cameroon was enacted in 1973 (Ordinance N0 73/20 of May 29th). This ordinance was signed to effectively manage urban challenges in the town of Bamenda and Cameroon in general.

Provision of the 1973 urban planning law

The 1973 law laid down rules guiding development in urban areas and so called on all the town in Cameroon to develop a town planning document to guide developments in their various jurisdiction. Following the law, several towns in Cameroon developed town planning documents including Bamenda town that developed it first master plan in 1985.

4.4.1 Implementation of the 1973 law in Bamenda using the 1985 master plan

Following the provision of the 1973 urban planning law in Cameroon, the first master plan of Bamenda town was conceived in 1981 and published in March 1985 (1985, Bamenda master plan). This plan was drawn based on two target periods; a short-term target period that was to last up to 1989 and a long-term target period that was to last up to 2004. The plan particular defined;

- Land use (residential, industrial and commercial land use)

- Localization of major facilities (education, health, administration and other facilities like sport and leisure facilities)

- Extension sites

- Major roads system

According to the plan, the built-up area of Bamenda in 1981 was 10.78km2. This area constituted; 65% for housing, 10% for facilities and 25% for roads.

4.4.2 Evaluation of the 1985 master plan

Efforts were made to implement the 1973 urban planning law in Bamenda through the 1985 master plan. Unfortunately, the implementation of this law in Cameroon and Bamenda was characterized by a lot of misunderstanding during this period until the early 2000. Coupled with the galloping effects of the population growth and the economic crisis of the late 1980s and 1990s that aggravated urban poverty, the master plan was poorly implemented. This was because; the various economic policies implemented under the Structural Adjustment Plan (SAP) virtually under look the urban sub-sector. Instead of the government galvanizing efforts towards ensuring the effective implementation of the urban master plan, her attention was now titled towards fighting the economic crisis. This led to the poor implementation and final abandonment of the 1985 master plan and subsequent growth of haphazard and uncontrolled development (urban challenges) in the Bamenda municipality

4.5 The 2004 urban planning law and the second Master Plan of Bamenda

In 2004, the 1973 law was revised through the enactment of law N0 2004/003 of 21/2004 regulating town planning in Cameroon.

4.5.1 Awareness on the existence of the 2004 urban planning law

The development of the urban planning regulation aimed at guiding urban dwellers in the habitation of urban space so as to ensure a harmonious, organized and sustainable development of the urban centers. The awareness on the existence of urban planning regulation therefore, set a base for the respect of these regulation. Priso (2011) held that, they continue to be problems regarding implementation and compliance with town planning laws in Cameroon cities. In a bit to confirmed this findings, the opinion of the inhabitants on the awareness of the existence of urban planning regulation in Bamenda municipality (68.2%) were not aware while (31.8%) of the respondents were aware of this regulation. This is in line with the UN habitat (1999) which opined that, the greater proportion in urban areas are not aware of urban planning regulations. Some of the inhabitance complained that they have never seen a hard copy of this laws or have been sensitized on it existence. This is a direct contradiction to section 49 of the 2004 law on town planning and urban development in Cameroon which state that "the involvement of the population, organized groups and civil societies in the implementation of general of town planning and management and construction should be encourage through free access to town planning documents as well as sensitization, training, research and education in the area of the town planning and management".

4.5.2 Provision of the 2004 urban planning law

This law called on all the urban towns in Cameroon to developed documents guarding development in their respective areas. The law equally gave provisions on the content and drafting of town planning documents and categorized town planning documents into, the urban master plan (UMP), the land use plan (LUP), the urban sector plan (USP) and the area plan (AP) are the main administrative documents that guide urban development in Cameroon. In 2008, the 2004 law on town planning and urban development was supplemented by 5 decrees aimed at improving the legal situation that have existed for several years in the areas of urban planning (law N0.2004/003 of 21st April 2004 decrees N0 2008/0736 of 23rd April 2008).

- Decree N0. 2008/0736 of April 2008 laying down condition for drawing up and revising town planning documents.

- Decree N0. 2008/0737 of 23rd April 2008 laying down safety, hygiene and sanitation rules applicable for construction works.

- Decree N0. 2008/0738 of April 2008 organizing land-use procedures and processes.

- Decree N0. 2008/0739 of 23rd April 2008 laying down land use and construction rules.

- Decree N0. 2008/0740 of 20th April 2008 specifying rules on penalties for violation of town planning rules.

The five decrees set the bases for demarcation of urban spaces into different land uses and eventually the development of new master plans for the towns of Cameroon. As a follow up to this, the town of Bamenda developed it second plan in 2012 that was finally adopted in 2014.

4.5.3 Implementation of the 2004 law in Bamenda via the 2012 Master Plan

The new and recent master plan of Bamenda was conceived in 2011, publish in 2012 and adopted in 2014. The plan critically examines the land use classification and the road network in the town. Land use classification is the systematic grouping of land into different uses based on common relationship. The essence of classification is to create order, eased communication to users of land and also help correct utilization of land by land users. It is basic tool in decision and policy making especially when land users are well understood. There exist different land users in Bamenda which have been classified into zones and roads network by the 2012 master plan to guide development in the town and check urban problems. The World Bank urban

development support projects (PNDP) are on-gong in the city of Bamenda to ensure this interconnectivity of land users. The different land users defined in the plan include:

- Residential land use (high, medium, low and mix density residential areas) with a total of 77.9% of the total urban land use

- Commercial land use (0.5% of the total urban land)

- Public and social service area with a total urban of about 6.3%

- Others land uses like road network (13.8%)

Field implementation of this plan was sub-divided into short-, medium- and long-term projects earmarked to cover the period 2011-2027. The short-term projects were estimated to run for a period of 4 years (2011 to 2015), the medium-term projects for a period of 4 years (2016-2020) and the long-term project for a period of 6years (2021-2027). The earmarked projects in the master plan were to be implemented by the different ministries and other stakeholders in the municipality.

4.6 Awareness on the existence of urban planning tools in Bamenda municipality

Four urban planning tools exist in Cameroon (the urban master plan, the land use plan, the urban sector plan and the areas plan). The urban master plan (UMP) is the most important as it embodies all the other three planning tools (Ndi et al 2017). It guides the development and allotment of land use in and urban areas and as such, an essential document in the sustainable development of an urban area. Despite the importance of this document, it is disheartening to observe that, majority of the urban dwellers in Bamenda municipality are not aware of it existence. Field data revealed that, 68% respondents were not aware of the existence of the Bamenda master plan as against 31% that were aware. Out of the 31% who were aware of the existence of the master plan, a majority of them testified that, they have never been sensitized or seen a copy of this master plan. They only hear of it existence from council officials when they pass around their construction site to stop the construction. Since the abandonment of the old master plan till 2014, Bamenda existed without any planning document. Based on this observation, it is clear that the haphazard and disorganized developments carried out in Bamenda municipality today is largely as a result of the ignorance on the existence of the recent master plan and non-implementation of the old master plan as shown in (Figure 18).
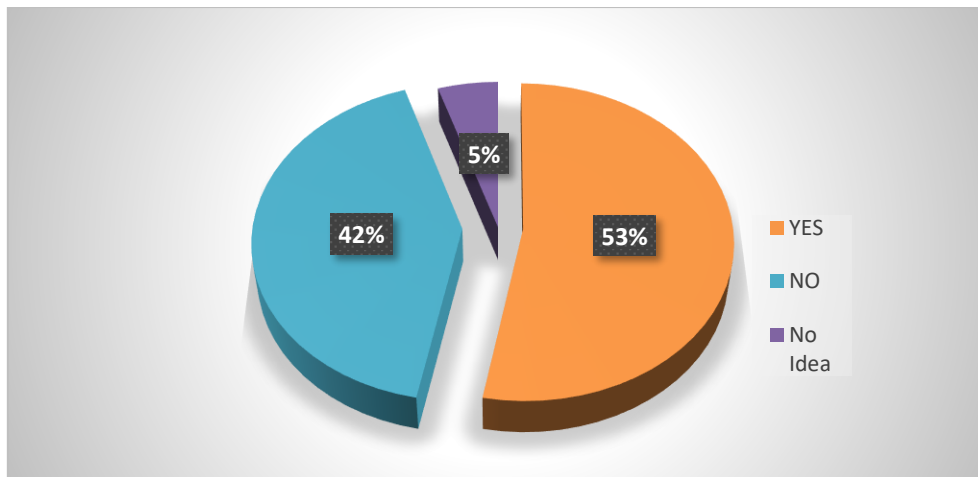
Source; *Field work, 2023*

Figure 18: The level of awareness of urban planning policies

Figure 18 present respondent response awareness to urban planning tools. Results from the table shows that a greater percentage of the respondents in the field answered yes with 53% of the respondents standing on this view and 42% of the respondents in the field rejecting this view that there are not aware of urban planning tools in Bamenda municipality while only 4% of the respondents stood on the view for no idea for reasons best known to them.

4.7 Evaluation of the 2012 Bamenda Master Plan

This section evaluates the relationship (match and mismatch) between developments and the Bamenda master plan. An integrated approach based on the different land uses will be used to compare the match and mismatch of development and the master plan. Reasons responsible for the match or mismatch will also be advanced.

4.7.1 Residential Areas

Residential areas in the town are mixed with other land uses. A total of 77.9% of the total urban space of the town is proposed for residential purposes (PDPBC, 2012). The master plan earmarked the different quarters of the town to be used for residential purposes which match with field realities. All the quarters of Bamenda like Bamenda-Nkwe, Menda-kwe, Ntafebu are proposed for residential purposes because Bamenda especially Bamenda is multifunctional municipality sharing residential function with other functions like administrative, religious and educational functions. These quarters are all used for residential purposes as proposed in the plan and as such match with master plan.

The probable reason for the match of some residential areas with the master plan is because, residential function is highly compatible with other land use functions like administrative,

religious, commercial and educational function. Equally some urban dwellers of the town actually consult the city authorities and follow up all necessary administrative procedures like obtaining a land title and building permit before carrying any developmental project on their land. During field study, it was discovered that some people had land titles and building permits to confirm this. However, building in most authorized residential areas of Bamenda do not appear in an organized manner as there do not follow a precise order and layout and as such create urban slums in the Bamenda municipality.

4.7.2 Unplanned areas

A total of 1.5% of urban land in Bamenda is proposed in the master plan for commercial activities. Commercial land uses in the town include building and offices used for business transactions and professional activities. Commercial activities in the master plan of the study area is restricted to the CBD, district center, markets, motor parks, shopping centers, Neighborhood center and corner shop spaces. As such, commercial land use greatly matches with the master plan of the municipality though with limited spaces reason to why shops are found along road side in the Bamenda municipality leading to urban disorder.

- **Road Network**

The major communication land use in Bamenda is road network. The master plan has classified urban roads in the Bamenda municipality. That is; regional roads, primary distributor roads, secondary distributor roads and collector or access roads. Regional roads are major roads that provide access in to the urban area and linkage with other regions. They are classified as N6 roads and have been designed for dual carriage way purposes (PDPBC, 2012). Primary distributor roads are roads linking other towns and suburban areas into the city center and are linked to regional roads. Secondary distributor roads are roads linking primary distribution roads and neighborhood within the town. These roads are 6-7m wide side drains. Collector roads are those that link secondary distribution roads and homes or business places. They are design to convey traffic from the secondary distributor roads and distribute to home and business places. However, some roads axis in Bamenda municipality do not respect planning. They exist some narrow collector roads linking some residential houses in some neighborhood like Abangoh that are less than 7meters wide. This is direct contradiction of the master plan part 1, chapter 4 of the 2004 town planning law in Cameroon which state that "Urban renewal and expansion shall be approved for building purposes only where it is served by a public or

private roads of at least 7 meters wide except specially prescribed by town planning documents or by the mayor of the council concern".

4.7.3 Urban agriculture and planning problems

According to the master plan, land for urban agriculture should be large enough to accommodate the growth and development of crops. Livestock areas should also be large enough for the animal to be raised in a fenced and gated area. Farming in the town according to the plan is restricted in areas prone to erosion, densely populated areas, flood plains that do not have adequate setbacks in the river channel or banks and farming activities that results to risky health and environmental degradation.

Unfortunately, some of the agricultural activities taking place in the Bamenda municipality like Bamendakwe and Ngomgham do respect planning. Agricultural site are not respected in the Bamenda municipality as unplanned agricultural activities is taking up space in Bamendakwe, Ngomgham and Abangoh central. Most of the crops cultivated here are mainly for home consumption with little of it being sole in Bamendakwe main and food market.

4.8 Contribution of Alien norms to underdevelopment of the Bamenda municipality

Cities in developing countries face acute problem of poverty, exclusion, insecurity and environmental degradation. The ever-widening gap between rich and poor is symbolized by the stark disparity of the living environment. This is reflected in the contrasting urban forms-exclusive gated communities are developing side by side with rundown neighborhood and slums as it is the case in the study area as the 1985 and 2014 master plan was drawn using colonial norms not taking into consideration the nature of the town.

Proper urban planning is the key to bridging the urban divide and is an essential tool to make cities inclusive, environmentally friendly, economically vibrant, culturally meaningful and safe for all. To be successful in helping to achieve urban development, planning need continuous updating. Great strides have already been made, but more is needed. This is evident in the study area as most works are still in paper with little implementation in the field. More so, they adopt their development strategies but from colonial masters which are not applicable in the present day society.

Urban planning does not achieve better cities automatically. Neither urban planning nor spatial design are ethically neutral activities. They translate-through resource allocations and budgeting exercise-political visions and values into the physical realities of cities. In many countries planning systems and decisions often protect the interest of the rich or are limited to

beautification and decoration of urban spaces. This very true in the Bamenda municipality as some areas are decorated and planed than the others. A good example is found in the around the up-station where most administrative offices are concentrated (Bamenda I municipality)

In many developing countries, (Cameroon and Bamenda municipality) planning systems and processes are still largely base on colonial laws, design to support spatial segregation and population country. They fail to reflect the need and urban priorities of urban residents. The urban model they have promoted has proved both unaffordable and inadequate for catering to the diversity of ways of life and need of developing world cities.

In the develop world, urban planning was originally conceived as a tool for the development of newly industrializing cities. Today, cities in many developed countries have to contain with processes of deindustrialization and shrinking population. Moreover, cities forms which were proposed as progressive and more efficient are under increased criticisms for the patterns of consumption they command, in the face of growing awareness of global climate change. Despite the fact that urbanization process adopted by the colonial master have failed to be applied in the western world, Cameroon and Bamenda town still continue depending on this fail urban development process that was once used by the colonial master and it failed them. This is a clear evident that urban development in Bamenda is going nowhere.

The failures of planning to come to terms with informality and poverty and to go beyond the modernist dream, has partly to be blame for the failure of cities as engine of economic growth and absorbers of surplus labors from rural area. This result in exacerbation of ecological crisis, hinders agricultural development and install a vicious cycle of poverty with more poverty-driven growth of the cities. This why urban sprawl is very common in the Bamenda municipality as people are seen living the town to the peripheries where living condition are affordable and favorable.

For urban planning to play a positive role in urban development, it need to vigorously access and reinvent itself-through a serious analyzing on the new context of urban planning and responses it can offer, by learning lessons from stories of innovation and success, and on this bases advocate vigorously for better and more appropriate planning for sustainable development.

Indeed today, like rarely before, there is global consensus on the need to reflect on modernist development patterns. Urban planning can be at the forefront of this and provide important responses.

4.9 Adaptation Strategies by the local population to urbanization challenges

In order to meet the problem of urban challenges, local planning policies can be quite effective. This means that municipalities take efforts that people stay in cities and do not settle down in the peripheries or ghettos.

This can be accomplished by increasing the living quality in cities compared to the peripheries. This is an easy but yet quite effective way. If these limits are quite strict, they lead to a significant reduction in urban problems since people are simply not able to build their homes in restricted areas. Moreover, by setting strict building permit limits, it is likely that the prices for buildings in suburbs increase. This makes it even more favorable for people to stay in the cities instead of settling in risky zones or creating urban ghettos as shown in (Table 22).

Table 24: Presents strategies of urban problems in the Bamenda municipality

Selected quarters in Bamenda municipality	Sensitization	Building permit	Land title
Abangoh Ntangang	17	1	1
Mulang	11	5	3
Ntamulung	10	6	1
Lower Ngamgham	12	4	5
Sisia I	7	1	3
Sisia II	6	3	1
Mbefi	2	10	5
Mbesoh	4	11	2
Bamenda-nkwe	18	12	10
Totals	87	53	31

Source: Field work July 2023

Table 24, present strategies of urban problems in Bamenda municipality in the various quarter which shows that sensitization is one of the best strategy with 87 respondents accepting that sensitization is one of the ways to prevent people from settling in risky zones in the field and building permit with 53 respondents, land title 31 of the respondents stood on the facts that building permit and land title are measures that be used to solve urban problems and avoid people from settling in areas that are prone to environmental risks in the study area.

4.9.1 Urban growth boundaries

Another related measure is urban growth boundaries. This means that a specific area is an area inside the boundary is used for urban development while the area outside the boundary is used for agriculture or other purposes, but not for settlement.

By using these boundaries, urban problems can be effectively mitigated since it is clear in advance where buildings are permitted and where they are prohibited.

- **Tax inversion**

Local authorities are also using tax discrimination in order to fight urban problems. Municipalities charged fewer taxes on certain services which make people to avoid settling in some part of the town.

This include the tax on housing. The council lower taxes in the city center to encourage people to settled around the city center, this discourage from going far since housing around the urban area is cheap.

- **Land acquisition by local governments**

Another measure against urban problems is land acquisition by local authorities. Through this acquisition, the local authorities decide on how the land acquired are be used which to an extent prevent people from settling in risky zones. Buildings are some prohibited from this lands acquired by the local authorities and are instead for reforestation or farming purposes.

- **Reduction in the number of private car ownership**

A rather unpopular but quite effective way to reduce urban problems would be to reduce the number of private car ownership. Setting limits for the overall number of cars that can be registered would give people the incentive to stay in the city center since they have not the necessary mobility to commute to work. This can also greatly reduce the rate of traffic jams in some areas in the municipality.

- **High taxes on fuel**

Some urban problems can also be mitigated effectively by raising the prices of fuel. This could be accomplished by setting higher tax rates. Through the increased price of fuel, people would have an incentive to reduce commuting which in return will reduce pollution in the town and also reduce the rate of traffic.

- **Higher taxes on change in land use**

If people own pieces of land that they now want to use for housing purposes, they have to get a permit for the change in the land use. These changes in land use could be taxed at a higher rate so that it would become more unattractive for people to turn their agricultural land into housing land.

4.9.2 Assure affordable housing

Housing prices are a big issue, especially in big cities. It is quite common that people are not able to afford a house with an average income in these areas. Thus, people have the incentive to leave and settle down in areas with lower housing expenses. Local authorities may therefore subsidize living in these areas in order to prevent people to leave. Education is an important incentive for people to stay in the cities, especially for families with young children. If the level of education is much better in cities, people will have an incentive to stay or move there. Hence, local authorities have to make sure that the education level in cities is better than in the suburbs in order to make people stay in the cities. The local authorities have put in some measures to mitigate this problems though not quite effective.

4.10 Conclusion

Hypothesis 3 states that "the use of alien urban development norms in Cameroon has rendered the process of urbanization in Bamenda less sustainable". To verify this hypothesis, data on respondent's awareness on the existence of urban planning tools (master plan and urban planning documents) in the Bamenda municipality and the relationship between urban planning and observed ground development (matching of actual urban landscape with urban planning tools) is used (Chebe 2019) working on urban problems and planning in Bamenda town.

Table 18 present respondent response awareness to urban planning tools. Results from the table shows that a greater percentage of the respondents in the field answered yes with 53% of the respondents standing on this view and 42% of the respondents in the field rejected this view that they are not aware of urban planning tools in the Bamenda municipality while only 4% of respondent stood on the view of no idea for reasons best known to them. The researcher foresees that they are some of them with ignorance of urban problems in the study area. Further findings revealed that some developmental projects in the Bamenda municipality do not match with urban planning tools. They exist residential houses in some restricted areas of the town like hill slopes of Abangoh and Bamenda-kwe escarpment that do not match with the master plan. Even commercial activities like the street vendors along the up-station road, industrial activities like motor garages and furniture workshops all over the town were observed not to match with the provisions of the master plan. This is an indication of poor implementation of urban planning regulations that have subsequently resulted to urban disorder in the Bamenda municipality.

Apart from ignorance of existence of urban planning tools and their ineffective implementation, finding revealed that, some urban dwellers constructed houses over night without the knowledge of council officials which do not respect town planning regulations. Others who are aware of these regulations refused to respect them for selfish reasons. Filed work also review that, the vision of urban planning in Bamenda is almost impossible as most of them are adopted from the western countries and so makes it illusion since the level of technology is not the same with that of the western countries. The towns in the western worlds are built in line with their temperature. The constant floods in the town are as a results of poor town planning. The type of temperature and rains that we have here are different from that of Europe. We generally have high intensity of rain and our nature of slopes are different. At such, water channels, drainage were supposed to be built using our type of temperature. Based on this, hypothesis 3 which states that; "the use of alien urban development norms in Cameroon has rendered the process of urbanization less sustainable" is accepted to an extent.

CHAPTER 5

GENERAL CONCLUSION

VERIFICATION OF HYPOTHESIS, SUMMARY OF FINDINGS AND RECOMMENDATIONS

Introduction

This study concentrates on urban challenges and sustainable management strategies in the town of Bamenda. In an attempt to sufficiently diagnose the problem stated which is based on urban challenges to sustainable urban development (waste management, traffic jam, related environmental issues and many others) in the town of Bamenda, a general objective and three specific objectives were set. These objectives had as main goal to evaluate how far certain urban challenges in the town of Bamenda has created problems of sustainable urban development. Data on the extent to which the objectives of the study have been attained is presented in the three chapters of this study. This same data is used for the testing and validation of the stated hypotheses.

Testing of hypotheses, analysis and discussions of the results

The testing of each hypothesis was based on the theory of perception in action that was drown from respondents' views and quantified through the survey instruments administered. The notion that perception is a requisite property of animate action; that without perception a research would be unguided, and without taking an action on that perception, it would serve no purpose constituted the departure point for a series of verification and validations of the stated hypotheses. Knowledge is the foundation of a process in which attitude, norms and perceptions of possibilities to act are carefully monitored to clarify and decide between behavioural alternatives. To verify these hypotheses a statistical tool was used notably the Chi square to analyse the data obtained in the field through direct observation, interviews, focus group discussions and the administration of questionnaire. After testing each hypothesis, some analyses and discussions of the results of the test exercise were made. Research hypothesis 1 is first tested, followed by hypothesis 25

Municipalities	Quarters	Effective resp.	Urbanization process has led to socioeconomic challenges	
Municipalities			Yes (x)	No (Y)
Bamenda I	Abangoh Ntangang	8	3	5
	Bamenda-nkwe	20	11	9
Bamenda II	Mulang	17	8	9
	Lower ngomgham	50	38	12
	Ntamulung	25	12	13
Bamenda II	Sisia 1	7	2	5
	Sisia 2	18	10	8
	Mbefi	5	3	2
	Mbesoh	2	2	0
Total		152	89	63

Table 25: Urbanization process have caused socioeconomic challenges
Source: Field work, 2023

The alternative hypothesis revealed that socioeconomic challenges of Urbanization in are of different types and are not caused by high birth rate and im-migration. Based on the respondents' views in table 21, research hypothesis 1 was tested using "Yes", "No" options. According to the results of the respondents' view, 89 responded yes and 63 responded no.

The validity of hypothesis 1 is also tested using the correlation index analysis which have the condition $-1 \leq rxy \geq 1$. This means that if the calculated correlation is less than or equal to negative one (≤ -1), it signifies that the hypothesis has not been affirmed (null). On other hand, if the calculated correlation is greater than or equal to one (≥ 1), it means the hypothesis has been affirmed (attained).

Conclusion and discussions

Urban sustainability in the 21st century should be pivotal to urban planners especially in developing countries. This is an era where western countries are already operating within the concept of "smart cities" while developing countries Cameroon inclusive are still facing

challenges of urban sustainability particularly the of Bamenda municipality. Informal and haphazard settlement, improper waste management, illegal occupation of public spaces, pollution just to mention a few, still characterizes our towns. The state organs and bodies concerned into the process of urban planning and dealing with the challenges needs to take quick and urgent actions to deal with such urban issues that do not even fits into the currents debates of this era. The paradigm shift from economic development to sustainable development requires that the city be built on a more respectful interrelationship of economic, social and environmental well-being. Conventional planning is about nudging the accommodating prevailing trends, but ecosystem planning is about choosing and pursuing a desirable future. It is clear that a new way of addressing urban problems is needed to encourage inter-jurisdictional decision-making, overcome the present fragmentation, isolation with integrated planning and implementation and to ensure consultation, facilitate cooperation, partnering, involving the widest range of stakeholders effectively and openly in the planning process to initiate long term monitoring, feedback, and adaptation of plans to assess what happens to communities and ecosystems as plan implementation unfolds.

Ngoran et al (2015) concluded that, urban planning in Douala and Cameroon in general is built in good laws and regulation but its implementation is inadequate. This is complemented by Ndi et al (2017) who held that, having a proper regulatory framework is not enough, but a sustained implementation and enforcement is more important. Results from this study corroborate the above findings as field work revealed that Bamenda is enshrined in good laws but implementation and enforcement is inadequate as seen with the outdated 1985 master plan that was neglected and recent master plan whose existence is largely not known by the population. The situation is further complicated by the fact that urban planning in Bamenda was done at a time urban challenges had engulfed the town. The time lapse between the old and recent resent master plan (1985-2014) was too long leading to the emergence of disorganized and haphazard developments which is difficult to redress. Urban planning deficiencies in Bamenda has therefore resulted to environmental socioeconomic and planning problems which hinders the sustainable urbanization of the town.

More so, population adaptation to urban problems planning strategies and effects in Bamenda municipality with all the stakeholders involved in urban planning and implementation of urban planning laws and the master plans in Bamenda municipality should be a focal point to both the government and the city council of Bamenda. Also, all the strategies

used by the people and local planning policies should be taken into serious consideration because it is these strategies that can solve urban challenges in the Bamenda municipality.

In a nutshell, the situation of urban challenges in Bamenda municipality is largely as a result of inadequate policy implementation and enforcement, insufficient flow of information to the population and tradition form of land acquisition. To curb urban problems and improve the sustainable growth of the study area through planning is a major call for concern, the researcher recommends the effective implementation of the recent master plan of Bamenda, the development of diverse methods of information dissemination to the population on urban planning regulation, putting in place a public structure that ensure transparency and accountability in the management of urban funds. Also, the existing town planning laws should be reviewed and made more participatory while decision making should be made more inclusive with all stakeholders in the town involved.

RECOMMEDATION FOR SUSTAINABLE URBANIZATION IN BAMENDA MUNICIPALITY

General Recommendation

The findings of this study revealed that rapid population growth, consummation, and poor waste disposal are some of the challenges to sustainable urban development in Bamenda. This study therefore recommends amongst other measures the strict implementation of planning regulation and the development of a roadmap that encapsulate the sustainable city development goals. In addition, the recycling of food and other solid wastes, reduction of industrial waste, enforcing air, and noise pollution controls, increasing investment in services in rural areas targeted to reduce rural-urban migration and a reduction in the national population growth rate are some of the measures that can be leveraged to achieve sustainable urban development in Bamenda.

Furthermore, land use maintenance measures such as ecological land use planning, open space preservation, tree planting and the creation of community gardens can be a cornerstone for sustainable urban development. Other specific recommendations are suggested as follows:

For parks: parks can provide places to gather, rest, meditate, and rejuvenate and if large enough, places to play. They should be well distributed throughout the city and other urban areas. Community gardens should be encouraged by greening-the-city movement.

For water management: City water resources are limited, wastage from leaks and abuse is high, and water quality is not monitored by WHO international guidelines for drinking water. Much remains to be done in terms of quantity, quality and financing. Certainly, efforts at reducing waste and improving water efficient are imperative. Water conservation initiatives involving metering and leak detection work by water agencies, as well as customer demand management strategies, must be supported by public education and incentive programs. There is a need to maximize the use of available water supplies before attempting to explore and expand new supplies at higher costs.

For solid waste management: The solution is generally considered to be prevention rather than clean-up, and the preferred options are; Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Re-manufacture Repurpose, and Recycle, Recover.

For energy: one of the strategies in any energy conservation program is the use of renewable energy options, such as photovoltaic (solar electric) power. Such panels produce electricity for independent systems with batteries for storing energy or supplying electricity to the power grid; solar thermal energy: solar hot-water systems typically provide water for showers and baths, and some solar thermal projects are designed to convert heated water into electricity for rural homes, and farms. Also, wind farms-cluster of wind turbines generate power for the electrical grid in some countries. Biomass: Agricultural plants or organic waste provide fuel-methanol or ethanol for use as an alternative for most oil or gas needs. Further recommendation goes as follow;

Recommendation to public authorities

Public authorities here include the different public stakeholders involved in urban planning (municipal councils, the Bamenda city council and the different ministries). The following suggestion may help to reduce urban challenges and improve the sustainable urbanization of Bamenda if enforced by these public authorities.

Effective implementation of the master plan

The new master plan of Bamenda town is enshrined with sound planning policies that can reduce the rate of urban problems if effectively implemented. The issue of good paper work but poor ground execution in Cameroon like the case of the 1985 Bamenda master plan that was neglected and abandoned is the problem. Good policies are always developed in the country but their implementation is a problem. Most of the short-term projects earmarked in the new master plan to be executed from 2011-2015 are still to be realized. Unfortunately,

construction of new houses is still on-going in the risky neighborhood yearly. If the authorities of the city council and MINDHU effectively implement the new master plan and prevent further settlement in these risky quarters, a sustainable urbanization may be achieved in the town.

Diverse method for sensitization of town planning regulation and the master plan.

Findings revealed that many urban dwellers in Bamenda town have little knowledge on the existence of urban planning regulations and the master plan. The development of diverse method for the sensitization of the population on urban planning regulations and the master plan like the use of mass media communication (Radio and TV programs on the City council projects and policies), city council publication like a magazine containing their projects and policies and organization of community base seminars especially to those in risky environment may help reduce the rate of urban problems in Bamenda. Thus, the BCC and MINDHU who are the main actors in urban planning needs to step up their methods sensitization so that the population can be aware of their plans and policies.

Creation of a structure that ensure transparency, accountability and enforcement of policies

One of the problems limiting the effective implementation of urban planning norms in Bamenda is the lack of strict enforcement mechanism to defaulters of urban planning norms. In this light, the research recommends the establishment of an enforcement and implementation structure that deal with council and state officials who mismanage public funds and defaulters of urban planning regulation by punishing them according to the law. This structure should also carry out regular monitoring and evaluation of town planning norms and its projects to ensure their effective implementation, accountability and transparency

The institution of an urban Growth Boundary UGB in Bamenda

The institution of an UGB in Bamenda as proposed in the idea of smart growth through the establishment of a greenbelt especially in the risky areas by the BCC and other state agencies may also help to reduce urban problems in Bamenda. This UGB show were the city is expected to grow and end. Modification of the UGB could only be made if the state confirms the expansion of the town following planning goals and standards. Some quarters like Sisia and Abangoh could totally be transformed into a green zone to limit the encroachment of people into these areas. The UGB should be well demarcated showing the limits of expected growth. This may eventually help to control urban problems in the town

Creation of rural development programs

One of the main causes of urbanization in Bamenda town and eventually urban challenges is the high rate of rural exodus in the country. Many young people in the villages of the North West region and other parts of the country see Bamenda town as a place to improve their lives. Most of them migrate to the urban center without any vision or what to do. This results to high unemployment in the town forcing some of these migrants to settle in low quality areas such as risky zones. The formulation and implementation of rural development programs by state agencies like ministry of youth and civic education and the ministry of agriculture and rural development may help retain youths in rural areas and limit the number of people migrating in to Bamenda. This may eventually help to reduce urban challenges in the town.

Recommendation to the population

The population of Bamenda equally have a role to play in controlling urban challenges in the study area. The following recommendation should be taken into consideration by the urban population to limit urban challenges in the town.

Respecting urban planning regulation

The non-respect of urban planning regulations by the population of Bamenda has aggravated. Most urban dwellers do not respect urban planning regulations. They violet these rules and carryout development projects in restricted areas like reclamation of land in Ngongham and Mulang for house construction. In addition, Sisia and Abangoh neighborhood are declared restricted areas for settlement, known by urban dwellers yet they continue to construct residential houses in these neighborhoods. It is thus recommended that, urban dwellers should play their role by respecting urban planning regulations in other to limit urban challenges in the town.

Infilling of the town

Land in many planned residential areas in Bamenda is poorly manage with vast unoccupied land between buildings in some areas. They exist vast unoccupied land in some planned residential area owned by people who are not willing to sell it for house construction in Bamenda. This forced some urban dwellers to be involved in sprawl. It is recommended that, land policies especially the land tenure system in Bamenda should be redressed and infilling of houses carried out as proposed in the smart growth theory. This should be done in planned residential areas like; Mulang, Ngomgham, Alakuma and Nkwen that are not prone to any risk

but having unoccupied land. Infilling of houses within the town may help to reduce the rate of sprawl in to ecologically fragile areas.

Recommendation to NGOs, other organization and traditional authorities

Non-governmental organization CBOs and traditional authorities also have a role to play in reducing urban challenges in Bamenda. The following recommendations should be considered by NGOs and other organization interested in urban challenges and planning in the study area.

Educating the population on urban planning norms.

NGOs, CBOs and traditional rulers can help to reduce urban challenges by educating the population on the ills of the disrespects of town planning regulations and the dangers associated with urban challenges. It is recommended that, NGOs and CBOs in the field of planning should organize regular seminars and sensitization forums especially with the population in restricted areas to educate them on the ills and dangers of living in restricted zones. This may help limit urban challenges in Bamenda.

Carrying out research and forwarding proposals to the state authorities

It is also recommended that NGOs, CBOs and traditional authorities interested in sustainable urban development should carry out regular research on planning and publish their findings. They should also work in collaboration with state authorities by providing information relating to un-control development in their communities. Example, people construct houses in restricted zones without the knowledge of the city council officials since there are not close to all the communities. The traditional authorities and CBOs can limit settlement in risky zones by providing regular information to the city council on development that are not in conformity with town planning regulation before their completion.

BIBLIOGRAPHY

Abbott, J. (2002). An analysis of informal settlement upgrading and critique of existing methodological approaches.

Acho-Chi (1998). Human Interference and Environmental Impact; Addressing Environmental consequences of rapid urban growth. In Environment and urbanization, 10(2): 161-174.

Acho-Chi. (1998). "Human interference and environmental instability: Addressing the environmental consequences of rapid urban growth in Bamenda, Cameroon," Journal of Environment and Urbanization, Vol. 10, pp. 161–174, 1998.

Amawa, S.G. and Kimengsi, J.N. (2009). Accelerated Urbanization in the Buea Municipality: The Question of Sustainability in the Provision of Social services. In the proceedings of the International conference on sustainable cities, Yaounde, Cameroon, 10-13.

ADB (2012). The State of Pacific Towns and Cities: Urbanization in ADBs Pacific Developing Member Countries; Asian Development Bank: Manila, Philippines, 2012.

Available online: (2016). https://unhabitat.org/wp-content/uploads/2016/02-old/Slum%20Almanac%202015-2016_EN.pdf (accessed on 31 May 2017).

Available online: *http://www.archnet-ijar.net/index.php/IJAR/article*/view/1094 (accessed on 31 May 2017).

Hyman, H. (1975). Interviewing in Social Research. Chicago. University of Chicago Press. ISBN 0226365387. 414 p.

Ogolo, M. (1996). Students Guide to Writing Research and Project Proposals. Pub: City-Creek Publishers, River state, Nigeria 45 p.

IFAD. (2011). New Realities, New challenges new opportunities for tomorrow's generations. IFAD, Rome. Pup. 18p.

INCOM (International Council of Museums) (2018). Culture and local development: maximising the impacts. Guide for local government, communities and museums. OECD. Pp 23-45. Pub.

Available online: https://unhabitat.org/wp-content/uploads/2014/03/WCR-%20Full-Report-2016.pdf (accessed on 30 May 2017).

Bakicit, T; Almirall, E. and 2012Wareham, J. (). A smart city initiative: the case Barcelona. J Knowl Econs 4 (2): 135-148.

Bayulken, B. (2015). Perceived 'Quality of Life' in eco-developments and in conventional residential settings: An explorative study journal of cleaner production.

Berger, J (2014) World of Mouth and Interpersonal communication: A Review and Directions for Future Research. Journal of consumer psychology, (24) 26.

Berger, M. (2014). The unsustainable city. Sustainability, 6, 365-374; doi: 10.3390/su6010365.

Boo, K. (2012). Beyond the Beautiful Forevers. Life, Death, and Hope in a Mumbai Undercity; Random House: New York, NY, USA, 2012.

Brundtland, G.; Khalid, M.; Agnelli, S.; Al-Athel, S.; Chidzero, B.; Fadika, L.; Hauff, V.; Lang, I.; Shijun, M.; de Botero, M.M.; et al. (2017). Our Common Future. Available online*: http://www.un-documents.net/our-common-future.pdf* (accessed on 31 May 2017).

Brundtland, G.H. (1978). Our common future-call for Action. Environmental Conservation, (14) 292.

BUCREP (2005). Recensement General de la population et de l'Habitat au Cameroun.

Daly, M. (2005). Gender mainstreaming in theory and practice. Social politics. Interntional studies in gender, state and society. DOI: https://doi/10.1093/sp/jxi023. Pp 433-450.

Das, A. A City of Two Tales: (2017). Shelter and Migrants in Surabaya. Environ. Urban. ASIA **2017**, 8, 1–21.

Davis, M. (2006). Planet of Slums; Verso: London, UK, 2006.

Dovey, K. (2013). Informalising Architecture: The Challenge of Informal Settlements. Archit. Des. **2013**, 83, 82–89.

Dovey, K.; King, R. (2011). Forms of informality: Morphology and visibility of informal settlements. Built Environ.**2011**, 37, 11–29.

Drakakis-Smith. (1981). Urbanisation, Housing and the Development Process; Croom Helm: London, UK, 1981.Glob. Urban Dev. **2008**, 4, 1–28.

Reerink, G.; van Gelder, J.(2002). Land tilting, perceived security, and housing consolidation in the kampongs of Bandung, Indonesia. Habitat Int. **2010**, 34, 78–85. Habitat Int. **2002**, 26, 303–315.

Habraken, N. (1998). The Structure of the Ordinary: Form and Control in the Built Environment*; Teicher, J., Ed*.; MIT Press: Cambridge, MA, USA, 1998.

Jones, P. (2016). Unpacking Informal Urbanism: Urban Planning and Design Education in Practice; Penerbit Press: Bandung, Indonesia, 2016.

Jones, P. (2016). The Emergence of Pacific Urban Villages: Urbanization Trends in the Pacific Islands; Asian Development Bank: Manila, Philippines, 2016.

Jones, P. *(2012). The Challenges of Implementing Millennium Development Goal Target* 7D in Pacific Island Towns and Cities. Asia-Pac. Dev. **2012**, 19, 139–162. Sustainability **2017**, 9, 1436 25 of 27 Fox, S. The Political Economy of Slums: Theory and Evidence from Sub-Saharan Africa. World Dev. **2014**, 54, 191–203.

Jones, P. (2016). Will Habitat III defend the Human Rights to the City? Conversation, 27 April 2016. Available online: http://theconversation.com/will-habitat-iii-defend-the-human-right-to-the-city-57576 (accessed on 31 May 2017).

Kamalipour, H. (2016). Urban Morphologies in Informal settlements. Contour Agency/Agents Urban. **2016**, 60–75.

Kimengsi, J.N., Fogwe, Z. (2017). Urban Green Development Planning Opportunities and Challenges in Sub-Saharan African: lessons from Bamenda city, Cameroon International Journal of Global Sustainability. 1(1).

Kimengsi, J.N.; Nguh, B.S,; Nafoin, A.S. (2017). Peri-urban land use dynamics and development implications in the Bamenda III municipality of Cameroon. Sustain. Environ. 2017, 2, 273-288.

Kometa, & Ndi, R. A. (2012).The Hydro-geomorphological Implications of Urbanization in Bamenda, Cameroon.Journ al of Sustainable Development, Vol. 13, No.4;20202345(6).https://doi.org/10.5539/jsd.v5n6p64jsd.ccsenet.org.

L. Motoyana and I. Masserb. (2005). "Management of natural hazard risk in Cartago, Costa Rica," Habitat International, Vol. 29, pp. 493–509, 2005.

Leontidou, L. Afouxenidis, A., and Kourliouros, E. (2002). Causes of Urban Sprawl in Athens

Levine, N. (1997). American Planning Association Journal 63 (1), 279-282. Literature, American Economic Association, vol. 36(3), pages 1426-1464. Longley, P., Batty, M., Chin, N. (2002), Sprawling Cities and Transport: preliminary

Mbanga, L.A. (2018). Human settlement dynamics in the Bamenda III municipality, North West Region of Cameroon. Journal of settlement and spatial planning, 9(1): 52-54.

Michigan Land Use Leadership Council (2005). "Defining Sprawl and Smart Growth"Mills, E. S. (1999), The Brawl over so-called Sprawl, In: Illinois Real Estate Letter, 1-7.

Minnery, J.; Argo, T.; Winarso, H ; Hau, D.; Veneracion, C.; Forbes, D.; Childs. (2013). Slum upgrading and urban governance: Case studies in three South East Asian cities. Habitat Int. **2013**, 39, 162–169.

Naik, M. (2015). Informal rental housing typologies and experiences of low-income migrant renters in Gurgaon, India. Environ. Urban. ASIA **2015**, 6, 154–175.

Nelson, A.C. (2001). Urban Containment Policy, Atlanta GA. Nformi B (2020), Urban Growth and Housing Challenges in the Bamenda Urban Space, NorthWest Region, Cameroon, P h D, University of Buea, Geography.C. Abbott, "Urbanization," Dictionary of American His-tory, The Gale Group Inc., 2003.Encyclopedia.com: http://www.encyclopedia.com/doc/1G2-3401804367.html Agenda 21, United Nations Conference on Environment & Development Rio de Janerio, Brazil, 1992. UN Habitat, State of the World's cities, Harmonious Cities, pp. 1–280, 2008/2009.

Neuwirth, R. (2005). Sha dow Cities: A Billion Squatters—A New Urban World; Routledge: New York, NY, USA, 2005.

Roy, A.; AlSayyad, N. (2004). Urban Informality—Transnational Perspectives from the Middle East, Latin America and South Asia; Lexington Books: Lanham, MD, USA, 2004.

Sakijege, T.; Sartohadi, J.; Marfai, M.A.; Kassenga, G.R.; Kasala, S.E. (2014). **Assessment** of adaptation strategies to flooding: A comparative study between informal settlements of Keko Machungwa in Dar es Salaam,Tanzania and Sangkrah in Surakarta, Indonesia. Jàmbá J. Dis. Risk Stud. **2014**, 6, 1–10.

Satterthwaite, D. (2008). Understanding Asia Cities: A Synthesis of the Findings from Eight City Case Studies.

Satterthwaite, D. (2016). Successful, Safe and Sustainable Cities: Towards a New Urban Agenda; Background Paper; Commonwealth Local Government Forum: London, UK, 2016.

Shen, L.; Peng, Y.; Zhang, X.; Wu, Y, (2012). An alternative model for evaluating sustainable urbanization. Cities **2012**, 29, 32–39.

The public meeting with community residents in RW7, kampung Lebak Siliwangi, 22 February 2017, was facilitated by academics from the Department of City and Regional Planning, School of Architecture, Planning and Policy Development, Institute of Technology Bandung (ITB) University. De Soto, H. The Other Path: The Invisible Revolution in the Third World; I. B. Taurus: London, UK, 1989.

The Urban Book Series; Springer: Cham, Switzerland, (2017). Available online: http://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=8&ved=0 ahUKEwi-1rT5hJfUAhXFj5QKHSMgDyMQFghDMAc&url=http%3A%2F%2Fjournal-dl.com%2Fdownloadpdf%2F5910882e3fbb6e13743eb6d7&usg=AFQjCNHG4foAl ucZVjlYZZbwTj2oRxhSw (accessed on 31 May 2017).

UN Millennium Development Goal Report, pp. 1–54, 2008.

UNESCO. (2002). "Education for sustainability, from Rio to Johannesburg: Lessons learnt from a decade of commitment," World Summit on Sustainable Development Johannesburg, pp. 1–46, 26 August–4 September 2002. C. Toulmin, "Securing land and property rights in Sub-Saharan Africa: The role of local institutions," International Institute for Environment & Development (IIED), London, UK. Journal of Land Use Policy, Vol. 26, No. 1, pp. 10–19, 2008.

UN-Habitat and UNESCAP. (2015). The State of Asian and Pacific Cities 2015; UN-Habitat: Nairobi, Kenya, 2015.

UN-Habitat. (2003). The Challenge of Slums: Global Report on Human Settlements 2003; Earthscan Publications: London, UK, 2003. Available online: http://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0 ahUKEwjJv8XvhpfUAhWBzpQKHRrBDg4QFgghMAA&url=http%3A%2F%2Fmi

rror.unhabitat.org%2Fpmss%2FgetElectronicVersion.aspx%3Fnr%3D1156%26alt%3D1&usg=AFQjCNF35f0K3vXL3mvZTAbJLcEDFzR2Uw accessed on 31 May 2017).

UN-Habitat. (2014). *The Evolution of National Urban Policies*: A Global Overview; UN-Habitat: Nairobi, Kenya, 2014.

UN-Habitat. (2015). Habitat III Issue Papers 22—Informal Settlements; UN-Habitat: Nairobi, Kenya, 2015. Available online: https://unhabitat.org/wp-ontent/uploads/2015/04/Habitat-III-Issue-Paper-22_Informal-Settlements.pdf (accessed on 31 May 2017).

UN-Habitat. (2016). Slum Almanac 2015/2016—Tracking the Lives of Slum Dwellers; UN-Habitat: Nairobi, Kenya, 2016.

UN-Habitat. (2016). Urbanization and Development: Emerging Futures. World Cities Report. Nairobi, Africa, 2016.

United Nation Conference on the Environment 1972 (accessed February 22, 2023)

UNECA, (2016). Greening Africa's Industrialization. Economic Report on Africa by Economic Commission for Africa.

United Nations General Assembly, (2017). New Urban Agenda. Available online: http://habitat3.org/the-newurban-agenda/ (accessed on 31 May 2017).

United Nations Human Settlement programme (UN-HABITAT), 2010.

WCED Report of the World Commission on Environment and Development. Our Common Future (the Brundtland Report), 1987. Available online: http://www.ask-force.org/web/Sustainability/Brundtland   Our-Common-Future-1987-2008.pdf (accessed on 1 August 2023)

Weksea, B.; Steyn, G.; Otieno, F. (2011). *A review of physical and socioeconomic characteristics and intervention approaches of informal settlements*. Habitat Int. **2011**, 35, 238–245.

Werlin, H. Urban development. (2010). The importance of public administration. J. Soc. Polit. Econ. Stud. **2010**, 35, 450–473.

World watch Institute, "Preface," State of the World 2007:

Yin, R. (2014). Case Study Research: Design and Methods, 5th ed.; SAGE Publications: Thousand Oaks, CA, USA, 2014.25.

Zhu, J. (2010). Symmetric Development of Informal Settlements and Gated Communities: apacity of the State—The case Study of Jakarta, Indonesia; Asia Research Institute Working Paper Series No. 135; National University of Singapore: Singapore, 2010. Available online: http://www.ari.nus.edu.sg/wps/wps10_135.pdf (accessed on 31 May 2017).

APPENDICES

The Chi Square Statistics

Types of Data:

There are basically two types of random variables and they yield two types of data: numerical and categorical. A chi square (X^2) statistic is used to investigate whether distributions of categorical variables differ from one another. Basically categorical variable yield data in the categories and numerical variables yield data in numerical form. Responses to such questions as "What is your major?" or Do you own a car?" are categorical because they yield data such as "biology" or "no." In contrast, responses to such questions as "How tall are you?" or "What is your G.P.A.?" are numerical. Numerical data can be either discrete or continuous. The table below may help you see the differences between these two variables.

Data Type	Question Type	Possible Responses
Categorical	What is your sex?	male or female
Numerical	Disrete- How many cars do you own?	two or three
Numerical	Continuous - How tall are you?	72 inches

Notice that discrete data arise fom a counting process, while continuous data arise from a measuring process.

The Chi Square statistic compares the tallies or counts of categorical responses between two (or more) independent groups. (note: Chi square tests can only be used on actual numbers and not on percentages, proportions, means, etc.)

2 x 2 Contingency Table

There are several types of chi square tests depending on the way the data was collected and the hypothesis being tested. We'll begin with the simplest case: a 2 x 2 contingency table. If we set the 2 x 2 table to the general notation shown below in Table 1, using the letters a, b, c, and d to denote the contents of the cells, then we would have the following table:

Table 1. General notation for a 2 x 2 contingency table.

Variable 1

Variable 2	Data type 1	Data type 2	Totals
Category 1	a	b	a + b
Category 2	c	d	c + d
Total	a + c	b + d	a + b + c + d = N

Note: notice that the four components of the denominator are the four totals from the table columns and rows.

Suppose you conducted a drug trial on a group of animals and you hypothesized that the animals receiving the drug would survive better than those that did not receive the drug. You conduct the study and collect the following data:

Ho: The survival of the animals is independent of drug treatment.

Ha: The survival of the animals is associated with drug treatment.

Table 2. Number of animals that survived a treatment.

	Dead	Alive	Total
Treated	36	14	50
Not treated	30	25	55
Total	66	39	105

Applying the formula above we get:

Chi square $= 105[(36)(25) - (14)(30)]^2 / (50)(55)(39)(66) = 3.418$

Before we can proceed we need to know how many degrees of freedom we have. When a comparison is made between one sample and another, a simple rule is that the degrees of

freedom equal (number of columns minus one) x (number of rows minus one) not counting the totals for rows or columns. For our data this gives (2-1) x (2-1) = 1.

We now have our chi square statistic (x^2 = 3.418), our predetermined alpha level of significance (0.05), and our degrees of freedom (df =1). Entering the Chi square distribution table with 1 degree of freedom and reading along the row we find our value of x^2 (3.418) lies between 2.706 and 3.841. The corresponding probability is 0.10<P<0.05. This is below the conventionally accepted significance level of 0.05 or 5%, so the null hypothesis that the two distributions are the same is verified. In other words, when the computed x^2 statistic exceeds the critical value in the table for a 0.05 probability level, then we can reject the null hypothesis of equal distributions. Since our x^2 statistic (3.418) did not exceed the critical value for 0.05 probability level (3.841) we can accept the null hypothesis that the survival of the animals is independent of drug treatment (i.e. the drug had no effect on survival).

Table 3. Chi Square distribution table.

probability level (alpha)

Df	0.5	0.10	0.05	0.02	0.01	0.001
1	0.455	2.706	3.841	5.412	6.635	10.827
2	1.386	4.605	5.991	7.824	9.210	13.815
3	2.366	6.251	7.815	9.837	11.345	16.268
4	3.357	7.779	9.488	11.668	13.277	18.465
5	4.351	9.236	11.070	13.388	15.086	20.517

Chi Square Test of Independence

For a contingency table that has *r* rows and *c* columns, the chi square test can be thought of as a test of independence. In a test of independence the null and alternative hypotheses are:

Ho: The two categorical variables are independent.

Ha: The two categorical variables are related.

We can use the equation Chi Square = the sum of all the $\square$ $(fo - fe)^2 / fe$

Here *f*o denotes the frequency of the observed data and *f*e is the frequency of the expected values. The general table would look something like the one below:

	Category I	Category II	Category III	Row Totals
Sample A	a	B	c	a+b+c
Sample B	d	E	f	d+e+f
Sample C	g	H	i	g+h+i
Column Totals	a+d+g	b+e+h	c+f+i	a+b+c+d+e+f+g+h+i=N

Now we need to calculate the expected values for each cell in the table and we can do that using the row total times the column total divided by the grand total (N). For example, for cell a the expected value would be (a+b+c) (a+d+g)/N.

Once the expected values have been calculated for each cell, we can use the same procedure are before for a simple 2 x 2 table.

Observed	Expected	$\lvert O - E \rvert$	$(O - E)^2$	$(O - E)^2 / E$

Suppose you have the following categorical data set.

Table . Incidence of three types of malaria in three tropical regions.

	Asia	Africa	South America	Totals
Malaria A	31	14	45	90
Malaria B	2	5	53	60
Malaria C	53	45	2	100
Totals	86	64	100	250

Appendix 1: Chi square statistical table

DF	0.995	0.975	0.20	0.10	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	0.0000393	0.000982	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.550	10.828
2	0.0100	0.0506	3.219	4.605	5.991	7.378	7.824	9.210	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.860	16.924	18.467
5	0.412	0.831	7.289	9.236	11.070	12.833	13.388	15.086	16.750	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.690	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.180	11.030	13.362	15.507	17.535	18.168	20.090	21.955	24.352	26.124
9	1.735	2.700	12.242	14.684	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.987	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.275	19.675	21.920	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.549	21.026	23.337	24.054	26.217	28.300	30.957	32.909
13	3.565	5.009	16.985	19.812	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.064	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.307	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.542	26.296	28.845	29.633	32.000	34.267	37.146	39.252
17	5.697	7.564	21.615	24.769	27.587	30.191	30.995	33.409	35.718	38.648	40.790
18	6.265	8.231	22.760	25.989	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.900	27.204	30.144	32.852	33.687	36.191	38.582	41.610	43.820
20	7.434	9.591	25.038	28.412	31.410	34.170	35.020	37.566	39.997	43.072	45.315
21	8.034	10.283	26.171	29.615	32.671	35.479	36.343	38.932	41.401	44.522	46.797
22	8.643	10.982	27.301	30.813	33.924	36.781	37.659	40.289	42.796	45.962	48.268
23	9.260	11.689	28.429	32.007	35.172	38.076	38.968	41.638	44.181	47.391	49.728
24	9.886	12.401	29.553	33.196	36.415	39.364	40.270	42.980	45.559	48.812	51.179
25	10.520	13.120	30.675	34.382	37.652	40.646	41.566	44.314	46.928	50.223	52.620
26	11.160	13.844	31.795	35.563	38.885	41.923	42.856	45.642	48.290	51.627	54.052
27	11.808	14.573	32.912	36.741	40.113	43.195	44.140	46.963	49.645	53.023	55.476
28	12.461	15.308	34.027	37.916	41.337	44.461	45.419	48.278	50.993	54.411	56.892
29	13.121	16.047	35.139	39.087	42.557	45.722	46.693	49.588	52.336	55.792	58.301
30	13.787	16.791	36.250	40.256	43.773	46.979	47.962	50.892	53.672	57.167	59.703
31	14.458	17.539	37.359	41.422	44.985	48.232	49.226	52.191	55.003	58.536	61.098
32	15.134	18.291	38.466	42.585	46.194	49.480	50.487	53.486	56.328	59.899	62.487
33	15.815	19.047	39.572	43.745	47.400	50.725	51.743	54.776	57.648	61.256	63.870
34	16.501	19.806	40.676	44.903	48.602	51.966	52.995	56.061	58.964	62.608	65.247
35	17.192	20.569	41.778	46.059	49.802	53.203	54.244	57.342	60.275	63.955	66.619
36	17.887	21.336	42.879	47.212	50.998	54.437	55.489	58.619	61.581	65.296	67.985
37	18.586	22.106	43.978	48.363	52.192	55.668	56.730	59.893	62.883	66.633	69.346
38	19.289	22.878	45.076	49.513	53.384	56.896	57.969	61.162	64.181	67.966	70.703
39	19.996	23.654	46.173	50.660	54.572	58.120	59.204	62.428	65.476	69.294	72.055
40	20.707	24.433	47.269	51.805	55.758	59.342	60.436	63.691	66.766	70.618	73.402
41	21.421	25.215	48.363	52.949	56.942	60.561	61.665	64.950	68.053	71.938	74.745
42	22.138	25.999	49.456	54.090	58.124	61.777	62.892	66.206	69.336	73.254	76.084

43 22.859	26.785	50.548	55.230	59.304	62.990	64.116	67.459	70.616	74.566	77.419
44 23.584	27.575	51.639	56.369	60.481	64.201	65.337	68.710	71.893	75.874	78.750
45 24.311	28.366	52.729	57.505	61.656	65.410	66.555	69.957	73.166	77.179	80.077
46 25.041	29.160	53.818	58.641	62.830	66.617	67.771	71.201	74.437	78.481	81.400
47 25.775	29.956	54.906	59.774	64.001	67.821	68.985	72.443	75.704	79.780	82.720
48 26.511	30.755	55.993	60.907	65.171	69.023	70.197	73.683	76.969	81.075	84.037
49 27.249	31.555	57.079	62.038	66.339	70.222	71.406	74.919	78.231	82.367	85.351
50 27.991	32.357	58.164	63.167	67.505	71.420	72.613	76.154	79.490	83.657	86.661

We could now set up the following table:

Observed	Expected	|O -E|	$(O — E)^2$	$(O — E)^2/ E$
31	30.96	0.04	0.0016	0.0000516
14	23.04	9.04	81.72	3.546
45	36.00	9.00	81.00	2.25
2	20.64	18.64	347.45	16.83
5	15.36	10.36	107.33	6.99
53	24.00	29.00	841.00	35.04
53	34.40	18.60	345.96	10.06
45	25.60	19.40	376.36	14.70
2	40.00	38.00	1444.00	36.10

Chi Square = 125.516

Degrees of Freedom = (c - 1) (r - 1) = 2(2) = 4

Table 3. Chi Square distribution table.

probability level (alpha)

Df	0.5	0.10	0.05	0.02	0.01	0.001
1	0.455	2.706	3.841	5.412	6.635	10.827
2	1.386	4.605	5.991	7.824	9.210	13.815
3	2.366	6.251	7.815	9.837	11.345	16.268
4	3.357	7.779	9.488	11.668	13.277	18.465
5	4.351	9.236	11.070	13.388	15.086	20.517

Reject Ho because 125.516 is greater than 9.488 (for alpha □□□□□□□

Thus, we would reject the null hypothesis that there is no relationship between location and type of malaria. Our data tell us there is a relationship between type of malaria and location, but that's all it says.

[Chi Square,](#)