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Original Paper

Assessing the Impacts of Urban Sprawl on Suburban Villages in the Bamenda Metropolitan Periphery, North West Cameroon

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Abstract

Man has been and remains mobile, conquering and impacting every space he occupies. Man's impact on space has been more accentuated since the 20th century than erstwhile in history, owing to demographic explosion and more advanced technological innovations. Urban space and adjoining lands are impacted most compared to the rural milieu. This study examines the ramifications of rapid and disordered urbanisation on peripheral villages to the city of Bamenda. This is crucial in understanding the threats and consequences of the phenomenon of unending urbanisation on contiguous agricultural land. The trend of urbanisation and resultant impacts were ascertained by analysing data drawn from national census figures, LANDSAT satellite images and suitable field surveys. Analyses revealed that a growth of 14.6% of the population between 1973 and 2018 produced a corresponding sprawl of 97.54% of the spatial extent of Bamenda metropolis, which presently covers 40.96 times the spatial area it occupied in 1973. This has grave repercussions for contiguous agricultural land and urban food security. The paper posits that a scrupulous compliance with existing urban master plans and implementation of carefully designed policies to protect agricultural land are inevitable in checking urban growth and its induced effects; and guaranteeing urban food security.

Keywords

urban sprawl, precarious peripheral communities, growth corridors, socioeconomic dynamism, metropolitan periphery, Bamenda

1. Introduction

During the last fifty or sixty years the highest rates of urbanisation have been in the less economically developed regions of the world. The start of this phenomenon coincided with when most countries in the African continent gained independence from the colonial powers of the North. New economic,

administrative and educational structures were set up leading to the development of many towns and big villages into growth poles that attracted population from the more rural areas. In the 1970s, one in four people living in the developing countries were urban dwellers (Clive, 2000); in 2017, UNECA figures indicated that 38% of the population of sub-Saharan Africa was urbanised, higher than that of Asia. By 2035, it is estimated that the rate of urbanisation in Africa will double. This same trend prevails in Cameroon whose urban population in 1960 stood at 13.94%; in 2005 at 48.8% (RGPH (Note 1), 2010) and 54.94% in 2016 with an urban growth rate of 3.63% (World Bank, 2016). This growth rate is even higher for some of the major towns of the country, for instance, Bamenda in North West Cameroon, the third most populous town, which recorded an urban growth rate of 4.9% in 2005.

The implications of such rapid urban growth are far reaching considering the housing and food needs of the ever growing population. The influx of population into urban areas and the incapability of public supply systems and structures to meet up with the soaring demand for these basic needs has caused a gross mismatch between supply and demand. The contiguous villages to large urban centres are increasingly faced with a mixed blessing of new marketing opportunities amidst increasing loss of farmland and farm labour owing to exurban growth. On the one hand there is a high demand for land: to construct new residences or speculators hold land in anticipation for future price hikes. This spurs neighbouring rural dwellers to sell off agricultural land to urban land speculators and individuals aspiring to own individual homes as the urban area sprawls. On the other hand, marketing opportunities for food stuffs increase as the rural population takes advantage of a growing market potential offered by the growing urban population. The question whether these marketing opportunities are to the benefit of rural dwellers remains unanswered to a large extent. The former is short-lived owing to the fact that most rural land owners permanently lose their land and chances of making money once the land is sold. The latter hinges on the former because the loss of the farmlands diminishes the agricultural potentials of the rural dwellers, the available market opportunities and consequently their principal means of survival. In the long run, these rural land vendors are plunged into a vicious cycle.

2. Geographical Setting

This study was carried out in the city of Bamenda, chief town of the North West Region of Cameroon and third most populous town of the country (RGPH, 2010) (Note 2). Bamenda is located between latitudes 5°50′ and 6°02′ north of the Equator and between longitudes 10°07′ and 10°16′ east of Greenwich Meridian (Figure 1).

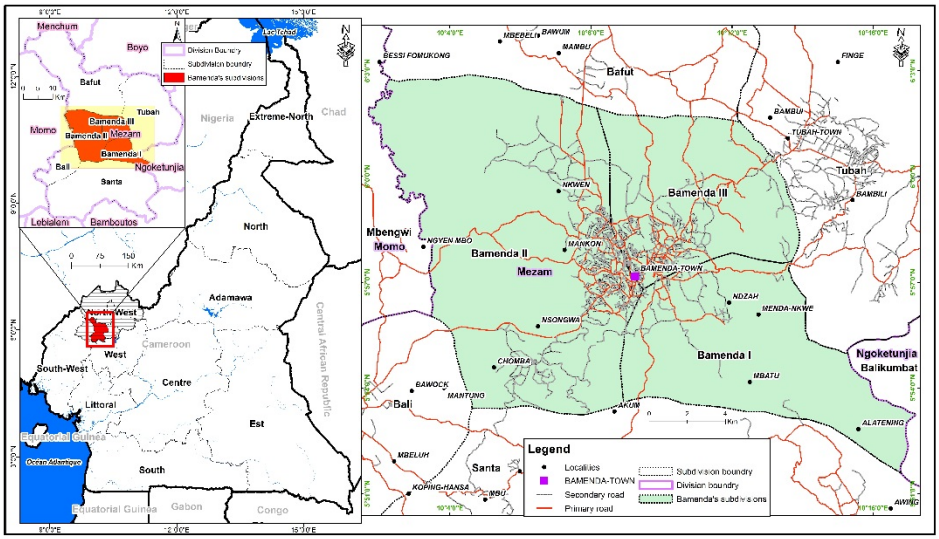

Figure 1. Geographical Setting of Study Area

The study area covers the city of Bamenda and its metropolitan periphery which is in constant evolution. The city spreads over seven chiefdoms viz. Bamendankwe, Mankon, Mbatu, Nsongwa, Chomba, Nkwen and Ndzah. From a small nucleus in Bamendankwe in 1973 that covered an expanse of only 117.72 hectares the metropolitan periphery in 2018 covered 4790.61 hectares (Note 3). The city comprises three administrative subdivisions namely Bamenda I, II and III (Figure 2).

3. Method and Data Sources

Data for this paper was sourced out from existing literature and Landsat images P186R056 captured by TM and ETM of waves 1, 2, 3, 4, 5 and 7 for 1987 and 2000 and OLI (Landsat 8) of waves 2, 3, 4, 5, 6 and 7 for 2018 on 30m spatial resolution each. Analyses of these images provided insight on the spatial and temporal evolution of the land use and land cover of the city of Bamenda and its periphery. This aided in assessing the changing patterns and the degree of urban sprawl.

4. Key Findings

4.1 Rapid Population and Spatial Growth

Rapid urbanisation is a common phenomenon the world over. Sub-Saharan Africa is said to experience the largest urban growth in the world. Today, Africa records over 30 millionaire cities, two of which are in Cameroon. According to the third general census on population and housing in 2005, the city of Bamenda is the third most populous city of Cameroon (RGPH, 2010) with a population of 269 530 inhabitants and an annual growth rate 4.9% after the bi-primate cities of Douala and Yaounde, first and second respectively. This rate exceeds the annual average urban growth rate of Cameroon which stands at 3.9% (UN data, 2018). Thus, the city of Bamenda grows faster than the national average. Considering the intercensal period, the population of Bamenda town has grown from barely 48 111 inhabitants in

1976 to 322 889 inhabitants in 2005. Basing on the growth rate of 4.9%, current assessment of the metropolitan population places the population at above 560 212 inhabitants, thus a growth by over 512 101 inhabitants in the last forty years. In like manner, a further extrapolation of the entire population including the periphery stands at 705 062 inhabitants up from 406 376 in 2005, with a population density of 99.9 inhabitants/km^2 above the national average of 37.5 inhabitants/km^2. This evidently has implications on the sprawling of the city and changes in patterns of land use and land cover. Figure 2 depicts the spatial growth of the city in response to increasing population growth.

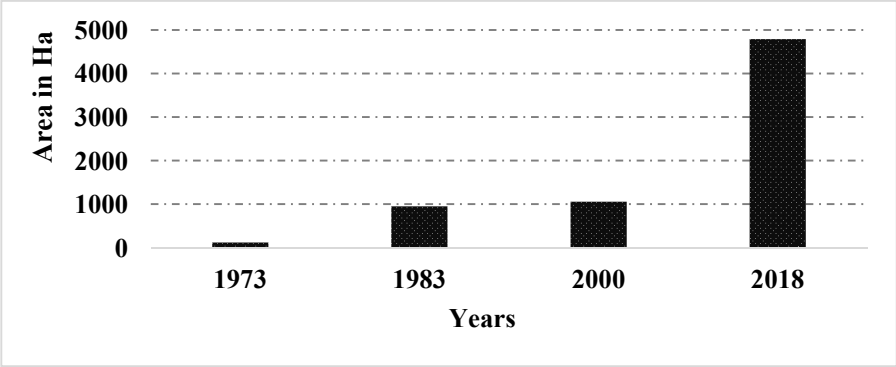

Figure 2. Evolution of Land Cover in Bamenda Metropolitan Periphery (1973-2018)

Bamenda developed its roots as a city during the colonial period when it was established as the regional administrative centre. Bamenda metropolis has witnessed a total addition of 4672.89 hectares in the last forty years. This depicts that a growth of over 14.6% of the population between 1973 and 2018 has produced a corresponding sprawl of 97.54% of the spatial extent of the Bamenda metropolis. This implies that in 2018 the Bamenda metropolis occupied 40.96 times the spatial area it occupied in 1973. This sprawl is mostly unplanned and uncontrolled and dispossesses indigenous rural land owners, creating impoverished and precarious peripheral communities and increased outmigration of new landless natives from these proximal rural areas.

4.2 Exurban Growth and Growth Corridors

Suburbanisation often yields to certain environmental, socioeconomic and cultural dictates which may either hinder or enhance exurban growth. In most cities, sprawling does not occur uniformly in the peripheries, thus some edges develop faster than others. In the main, socioeconomic factors promote the development of growth corridors and edge cities (Note 4) which are a characteristic feature of exurban growth. They generally develop along major transport routes and motor-way intersections away from large urban centres respectively. This phenomenon is common place in developed countries, however, it is increasingly being observed in developing countries. In the case under study, exurban growth is mostly in the form of growth corridors. Two major axes constitute growth corridors around the Bamenda metropolitan periphery, notably the Bamenda-Mankon-Bafut axis to the north and the

Bamenda-Nkwen-Bambui-Bambili axis to the north east (Figure 3, 2018). These growth corridors owe their growth to the location of the Bamenda airport (IATA code: BPC, ICAO code: FKKV) and the private and State universities respectively.

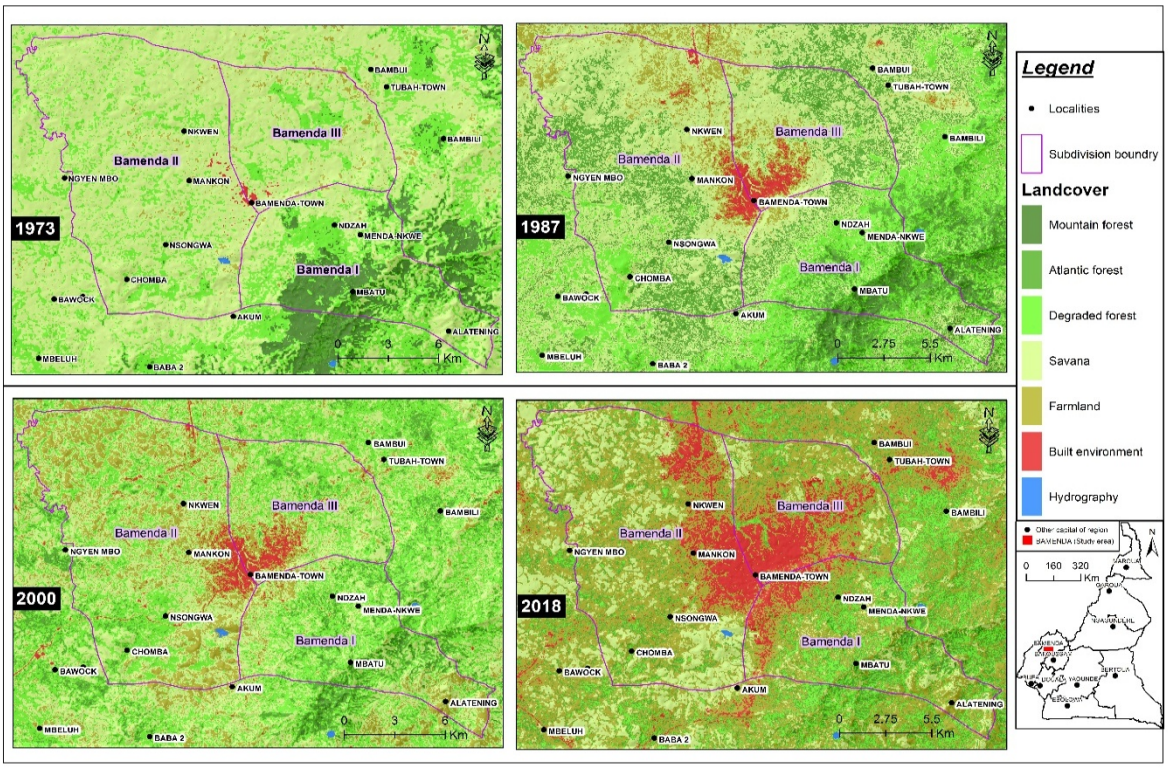

Figure 3. Spatial Pattern of Land Use and Land Cover in Bamenda Metropolitan Periphery

The development of the growth corridors began in the 1980s as depicted by Figure 3 (1987) with a marked development of the northern corridors. Figure 4 further illustrates the development of Bamenda metropolis and these growth corridors. Urban sprawl became accentuated between the years 2000 and 2018, especially along growth corridors 1 and 2 to the north east and north of Bamenda respectively. This can be accounted for by the creation of growth poles viz. the National Polytechnic in 2005 (Note 5) and the University of Bamenda in 2010 along growth corridor 1. Sprawling along growth corridor 2 ensued from the siting of the Bamenda airport along the Bamenda-Mankon-Bafut road in 1986, but this corridor witnessed a slow rate of development owing to controlled urban growth around the airport. Corridor 3 to the south of the town witnessed the slowest growth, despite the presence of the major entry axis into the town from Yaounde and Douala, the major cities of Cameroon. This can be accounted for by the hilly terrain with altitudes ranging from 1350m-2500m asl and the presence of the Bamenda escarpment (1400m asl). The western periphery—Figure 4-E—has not experienced marked urban sprawl due to the absence of any major growth factor.

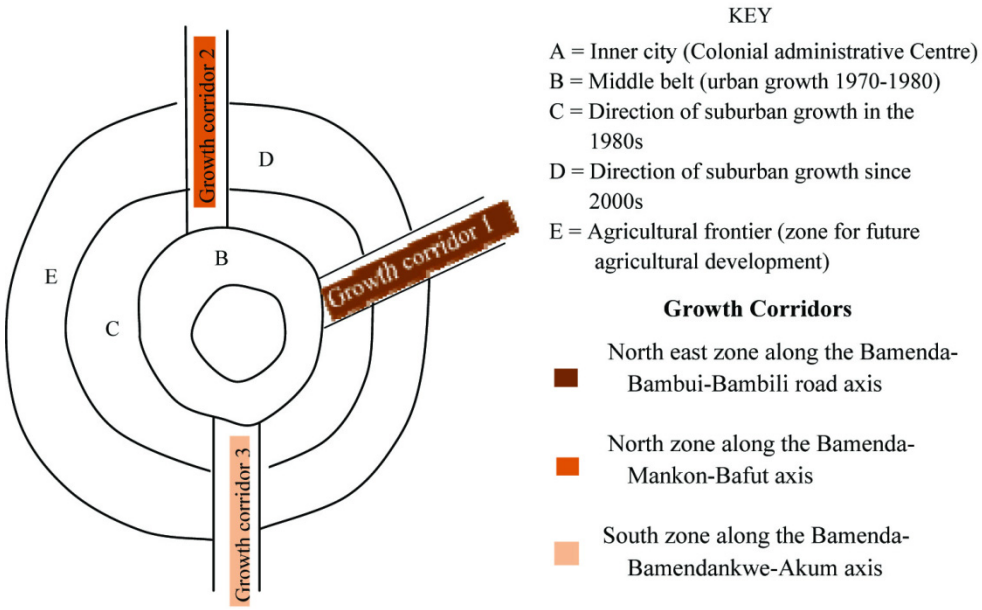

Figure 4. Growth Corridors around Bamenda Metropolitan Periphery

This new suburban growth (zones C and D) has extended the geographical limits of Bamenda metropolis into the adjoining rural areas over a distance of over 10 km to the north and more than 15 km to the north east. Between 1980 and 2018, the built up environment of Bamenda city has increased by 3,843.4 ha up from 947.2 ha. In 2018, the city occupied 80.2% more space than it did in 1973. Besides the siting of public facilities that have triggered growth along the growth corridors, the city of Bamenda sprawls uncontrollably in all directions yielding an amorphous structure. The rate of spatial growth is however heterogeneous as the north east (growth corridor 1) experiences the fastest rate as depicted by Figure 3 (2000 and 2018) and Figure 4.

4.3 Loss of Contiguous Agricultural Land and Farming Further Afield

FAO (2010) placed the per capita availability of cultivated land in developing countries at 0.2ha/person in 2000 and estimated that the per capita availability of land in developing countries is expected to halve to 0.12ha/person by 2050, under strong demographic pressure. In the case under study, farm land is subjected to demographic pressure as perceived through urban sprawl. The loss of peripheral agricultural land is accentuated on the northern frontier of the Bamenda metropolitan periphery owing to the fairly level nature of the terrain and extant growth poles. This portion is characterised by an undulating plain with altitudes ranging from 1200m to 1850m asl. On the other hand, urban sprawl is slower on the southern frontier due to the hilly nature of the area and the presence of the Bamenda cliff, and on the western frontier due to the absence of growth poles.

The Bamenda metropolis is located in a milieu where there are strong cultural beliefs and imprints that shape land occupancy and ownership of landed property that depict manhood. Culturally, individual ownership of land and a house are indicators of having attained manhood and a respectable position in the

society. It follows, therefore, that with demographic increase there is a corresponding increase by the male folk striving towards individual ownership of land and abodes that accentuate the spatial growth of the city contrary to a vertical growth.

It is common knowledge that cities expand spatially at the expense of adjoining agricultural land. An interesting phenomenon around the Bamenda metropolis is that the loss of the adjoining farm land is compensated with farming further afield owing to the absence of greenbelt around the city. Consequently, findings revealed that the proportion of farm land has rather increased (Figure 5). However, this increase is characterised by more distant farm fields. This trend confirms Robert Sinclair's model of agricultural land values where agricultural intensity and efficiency tend to increase away from city centres in response to the blight effect of urban sprawl on land values for agriculture. In a study of the impact of socioeconomic and environmental changes on food security in the southern periphery of Bamenda, Ngwasiri (2012) also underscored that more than 60% of farmers have taken up opening up new farms further afield as a response to urban sprawl. This corroborates the increase in farmlands over the years and helps to curb food insecurity; nonetheless, farming further afield is plagued by problems of accessibility and evacuation of farm produce.

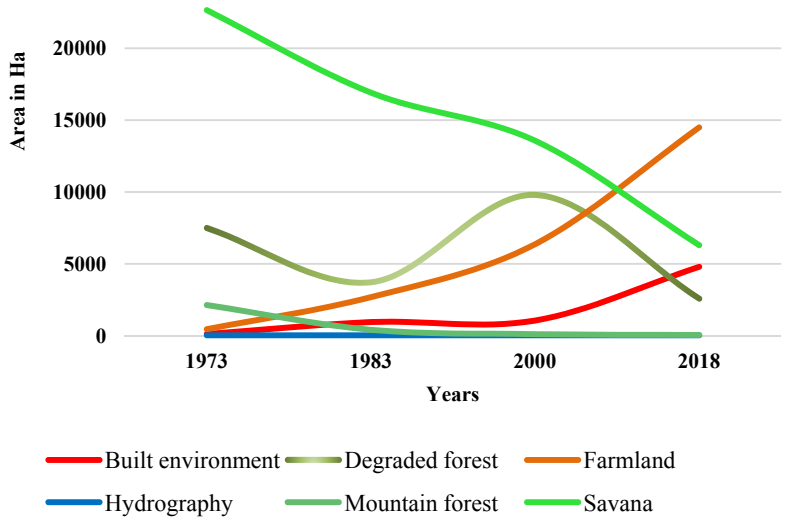

Figure 5. Land Use Dynamics around Bamenda Metropolis

Farming further afield has developed at the expense of vegetation cover. As depicted by Figures 3 and 5, much of the forest vegetation is degraded or has almost disappeared while savannah has witnessed a marked decrease. Mountain forest vegetation has reduced from 2,127.2 ha in 1973 to 50.9 ha in 2018 and savannah from 22,657.1 ha to 6,289.8 ha within the same period. In relative terms, 97.6% of forest and 72.2% of savannah have been lost as farm land has increased further afield by 96.6% over a period of forty-five years as the city has sprawled.

The degradation of this vegetal cover poses enormous concerns for the climate-environment-food security nexus. The uncontrolled degradation of vegetation around Bamenda impinges on Cameroon's laws on town planning (Note 6) and environmental management (Note 7) and, COP 21 2015 programmes on Reducing Emissions from Deforestation and Forest Degradation (REDD) in view of a sustainable use of the natural resource base. The Bamenda municipality stands to benefit from a recourse to strict adherence to national laws and to ratified international accords on restoration of forests and forest landscapes, and environmental protection. Bamenda municipality cannot boost of any standard park or open space and there is a complete absence of green spaces. It is only in 2012 (MINDUH) that the physical development plan of Bamenda allocated 3.8% of the total land area for recreational facilities for prospective development of standard parks and green spaces, which is yet to be undertaken. The most feasible options to curb further degradation will be to create green spaces within the municipality and agricultural parks in the western edge of the city (zone E Figure 4), in a bid to check excesses on the climate and environment, and to safeguard contiguous farmland to provide food for the urban dwellers in the long run.

4.4 Preservation of Agricultural Land

As indicated in Figure 4, the western frontier of Bamenda city has experienced the least sprawl, consequently prospective agricultural frontiers to guarantee food supply to meet the growing needs of an ever growing metropolis still exist on this western edge. Based on the three administrative subdivisions of the city (Figure 3: 2018), the peripheries of Bamenda II followed by Bamenda I still offer sizeable agricultural land.

Bamenda I: on the southern periphery with one zone

1) Outskirts of Bamendankwe which for now is uninhabited, however the problem for agricultural development will be the high altitude (1800-2500m) and no practical roads. This hilly terrain offers the possibility of developing terracing to extend agricultural land.

Bamenda II: the western edge constitutes the major prospective agricultural frontier with three sub zones

1) Outskirts of the northern periphery towards Bafut and Mankon rural;
2) North western frontier towards Mbengwi and Bali;

Sub zones 1 and 2 are low lying areas (below 1400m) which would facilitate agricultural production. Bafut and Bali lie along major access roads which provide an added advantage for the evacuation of farm produce.

3) South western periphery towards Mbatu rural, Nsongwa rural and Chomba rural are small in surface area and, Mbatu which lies at the foot of the Bamenda escarpment is hilly.

Bamenda III: eastern edge of the city, which has suffered most from urban sprawl has little available farm land still left in isolated places.

1) Ndzah after the palace of the traditional authority is still basically rural;

2) After Mile 6 Nkwen along the Bamenda-Bambui-Bambili road axis, precisely near Magzi zone however, this sub zone is not very suitable as an agricultural zone because it is near the previewed heavy industrial zone.

These identified prospective agricultural frontiers need to be conserved in order to curb the impact of uncontrolled sprawling of the town on adjoining farm land and its ensued incidence on future food supply. This can be achieved if the government of Cameroon perceives the imminent dangers of uncontrolled spatial growth and embarks on policy options that will designate areas where no urban development is allowed. This can be achieved through coordinated efforts between the municipal authorities in collaboration with the traditional authorities of these adjoining villages. Alternatively, the current urban sprawl can be controlled by channelling population growth to small towns or cities (through the creation of growth poles in smaller towns) and by increasing urban density through compaction or consolidation.

5. Discussion

Problems caused by urban growth have been felt since the 1930s, however, the most remarkable being those provoked by suburbanisation have been the most daunting to tackle. Urban sprawl, being one of them, engenders a number of problems not only in the urban area, but the resultant problems are also felt in the rural-urban interface and in the rural area as well. Urban sprawl has been viewed as a problem since the 1980s notably through the loss of farm land and natural areas around cities; provoking environmental problems such as air pollution and flooding; spatial spread of urban built-up area creating a mismatch between supply and demand for urban services, amongst others. Considering that urbanisation is one of the driving forces of the development of the planet in the 21st century (UNECA, 2017) and is unlikely to halt in the foreseeable future, it is vital for governments of the South to adopt policies that target potential solutions that are beneficial to the urban, suburban and rural areas alike. Such could include measures to limit construction of low-density settlements in the suburbs by some tax system but this must be preceded by the construction of decent low-cost high-density housing within the built-up area. In addition, the government of Cameroon needs to espouse urban and rural planning as a matter of principle and not just as haphazard documents that are conceived and later shelved without any significant impact. Planning will target the creation and preservation of agricultural land near cities for the development of urban agriculture and State policies to provide amenities in smaller towns or villages to maintain population there. In this regard, coordinated planning and effective execution of development plans ought to become the norm.

Proponents of urban sprawl argue that though urban sprawl is a reality, it is neither a new phenomenon nor does it devour as much land as is blamed on this phenomenon. These arguments, in the case of the USA, hold that less than 5% of land surface is built on and that only a quarter of farmland lost since 1945 has been due to urbanisation (Alisdair, 2000). This view, however, might be tenable for countries where there is adequate farmland like in the USA with large expanse of land and, farming belts are well planned

out and well developed and/or where urban and rural planning is embedded into development policies and are effectively implemented. In the case of Cameroon where development planning is more of a catchphrase than a reality and where the major cities are growing rapidly, urban sprawl is particularly a problem.

6. Conclusion

Urban sprawl has been viewed as a mixed blessing to urban and suburban development. The pull of suburban areas offering better quality and spacious living environments, and sites for new industries in high-tech and financial services harbour in them the problems that these areas face. In countries with small surface areas or with poor or inexistent development planning, urban sprawl poses grave socioeconomic and environmental problems. Many attempts have been made so far in cities of the North to limit the impacts of urban sprawl through planning laws and establishment of green belts, compact and well-connected cities, mixed land use patterns with homes and workplaces and shops together, amongst others with varying degrees of success. All these attempts nonetheless still fall short of addressing the loss of contiguous rural farm lands because human societies just like humans themselves are biotic and they grow. Despite this observation, there is need to address these problems especially in the LEDCs where poor planning is rife. Some Cameroonian cities have designed Urban Master Plans which are either seldom scrupulously used or are completely outdated while rural planning is non-existent. The observed trends of urban sprawl of Cameroon's major cities (Douala, Yaounde and Bamenda) confirm Alisdair Rogers (2002) viewpoint that urban sprawl is often the result of poorly planned or unplanned development and consists of constructing low-density settlements beyond the boundaries of built-up areas. The problems created by urban sprawl cannot be successfully tackled in an isolated manner consequently joint planning through an integrated policy of land use is most reasonable. Cameroon is an LEDCs with only two millionaire cities and whose third most populous town is still currently at about half a million people; hence, political will in tackling the current problems and in charting a way forward especially for small towns is of paramount importance.

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Notes

Note 1. RGPH stand for General Population and Housing Census conducted by Cameroon's national census office commonly known by the French acronym BUCREP-Bureau Central des Recensements et des Etudes de Population (Central Bureau for Censuses and Population Studies).

Note 2. Ibid 1.

Note 3. Bamenda city council surface area is 1076km^2 with a population density of 300 inhabitants per square kilometre.

Note 4. Edge cities are suburban areas that have more office buildings than are found in the CBD; a concept coined by Joel Gerreau who observed this phenomenon outside most US cities in the early 1980s. Edge cities usually have more office space, more shops and less residential space.

Note 5. A broad-based institution of higher learning aimed at providing academic, professional, technical and vocational skills to students and contributing to national development. National Polytechnic Bamenda started off in 1996 at the Comprehensive High School Bambui campus and adopted the name National Polytechnic Bambui, in 2000 it relocated to St Frederick in Bamenda town, and eventually relocated to its present site at Mile 7 Nkwen in 2005.

Note 6. Law N^{o} 2004/003 of 21 April 2004 on Town Planning in its Chapter II section I Article 25 gives dispositions to urban councils on preserving agricultural activities and protecting forest landscapes within their jurisdictions.

Note 7. Law N^{o} 96/12 of August 5, 1996 on the Framework Law on Environmental Management.