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## Urbanization and Urban Sprawl in the Post-Colonial Era Douala City, Cameroon

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### ABSTRACT

*The history of the port city of Douala spans pre-colonial period, colonial period of the Germans and French occupation, the post-colonial era and the contemporary situation with continuous occupancy of the coastal environment. This article looks at the relationship between the history of the city of Douala to the resulting urban situation focusing on governance structure as well as rapid urbanization. The findings show that governance structure allowing for a duality of modern political system and traditional cultural system of kingships and chiefdoms has an effect to the resulting urban sprawl. Moreover, rapid urbanization under this condition has an overall impact to the challenges resulting from urban sprawl including development of settlements that do not have basic services. Developing comprehensive urban planning policies that prioritize sustainable and green building practices and transport systems, promoting the use of locally sourced building materials, use of technology to encourage generation of renewable energy, encouraging a broader participation of local communities in the planning and development of the city are some possible interventions recommended to ensure a more sustainable and resilient city of Douala.*

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### INTRODUCTION

Over the past five decades, developing countries have experienced a profound and rapid urbanization surge (Gollin *et al.*, 2016; Guan *et al.*, 2018). This global phenomenon has placed cities worldwide on the brink of critical urbanization challenges (UN-Habitat, 2016). The 2016 World Cities Report highlights the staggering rate of urbanization, especially

in the world's least developed regions, with Africa leading the way. Sub-Saharan Africa and the poorest regions of South Asia will experience a trebling of development over the next two decades, with Sub-Saharan Africa possessing the highest annual urban growth among Global South nations over the preceding two decades (UN, 2017). Urbanization has disproportionately affected Sub-Saharan Africa, a formidable

and global challenge for many countries in the Global South. Rapid urbanization has increased the demand for urban spaces that can accommodate the diverse activities of a developing population (Dhari, 2020; Gouellain, 1973). Although urban sprawl is not a novel concept, it remains a challenge for policymakers around the globe.

Central Africa's Cameroon is not immune to the forces of urban expansion. The lack of a universally recognized definition of urban sprawl (Ngoran & Xue, 2015) further complicates this issue. Aretouyap et al. (2022) have recognized that the Cameroonian coastal city of Douala is coping with significant, unplanned urban expansion resulting from industrialization and urbanization. Douala is the economic capital, main seaport and the industrial nerve of Cameroon. Douala city harbours about 80% of the Cameroon's industries (Ngoran, 2014). Due to the centralized nature of economic activities in Douala by the State, the city has witnessed a tremendous growth, more than any other city in Cameroon (Ngoran, 2014).

Douala's route to urbanization is distinctive because it neither parallels the path of industrialized economies nor replicates the models observed in developing nations. Despite this, accelerated urbanization and economic growth have spawned a multitude of environmental, social, and governance challenges (Zhang, 2016; Guan *et al.*, 2018). The fast-developing nature of the city coupled with limited human and physical capital and poor management policies have resulted in intense anthropogenic pressure on limited coastal resources.

In response to these intertwined challenges, sustainable urbanization (Njoh, 2002; Kessides, 2006; Cobbinah & Darkwah, 2017; Kimengsi & Fogwe, 2017; Yeyouomo & Asongu, 2023) have been recommended as an effective strategy for promoting the sustainable development of urban regions in Cameroon. Multiple cities nationwide have pursued sustainable urbanization from various perspectives,

resulting in many experiences and lessons. However, a comprehensive evaluation of these experiences, informed by current research on sustainable urbanization in Cameroon, particularly Douala, is surprisingly absent. Therefore, this article aims to analyse the evolution of the city of Douala and how integrated planning and sustainable construction can be used as a tool towards sustainable urban development.

## **MATERIALS AND METHODS**

This paper presents a broad literature review albeit with a limitation on availability of published data that analyse the evolution of the city of Douala through the lens of its history and the resulting challenges that faces the city today.

This paper works on the hypothesis that urban planning strategies employed throughout history has influenced urban sprawl and the resulting challenges in the city.

### **Douala: A Geographical and Historical Overview**

Situated in Central Africa, Cameroon on the Gulf of Guinea shares borders with Nigeria to the west, Chad to the northeast, the Central African Republic to the east, the Republic of Congo, Gabon, and Equatorial Guinea to the south, and the Atlantic Ocean to the southwest (Murielle *et al.*, 2020). It's inland capital, Yaoundé, is a political and administrative capital whilst its busiest city, the seaport Douala, is the economical capital (Figure 1).

Cameroon's history is replete with indigenous cultures and kingdoms, such as the Tikar, Bamum, and Duala. After World War I, Cameroon was divided into French and British territories during the colonial era (Awasom, 2003) where Douala, located in the French-controlled region, became a major economic hub. In the early 1960s, when Cameroon obtained independence from France and the United Kingdom, Douala remained a vital economic and

commercial centre for the newly established nation (Figure 2).



Figure 1: Map showing the location of Douala (Johnson, 2009).

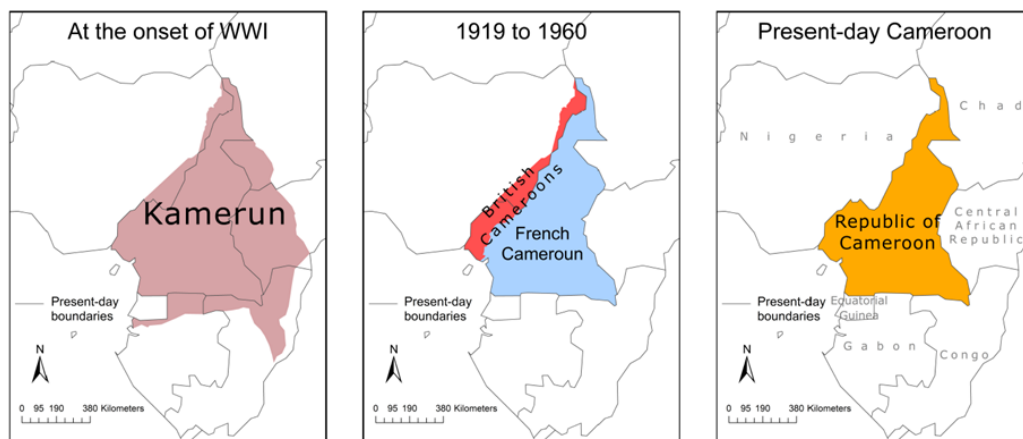


Figure 2: Evolution of Cameroon (Gifford et al., 1967; as cit. in Guarnieri & Rainer, 2021).

Douala is situated at  $4.0511^{\circ}$  North latitude and  $9.7679^{\circ}$  East longitude inland within the Cameroon estuary, strategically positioned along the banks of the Wouri River. Its location is characterized by the narrowing of the Wouri river, which naturally facilitated the formation of a channel suitable for a port. The city's current site is defined by distinct natural boundaries: the Dibamba river to the east, the Bomono and Moungo creeks to the west, the Nsapé watershed to the north, and the Manoka Bay to the south, where the Dibamba joins the Wouri covering a total of  $923 \text{ km}^2$ .

The climate is equatorial with four seasons, comprising two rainy seasons and two dry seasons. The relative humidity is high at about 85%, especially during the rainy

season. The average temperature is  $28.7^{\circ}\text{C}$  with small thermal amplitudes that vary little depending on the location. Due to the tropical climate, Douala receives high annual rainfall with an average of 4400 mm. A normal year in Douala witnesses between 230 and 250 days of rainfall, with a peak in precipitation during the months of July to September. The dry season, on the other hand, is relatively short and spans approximately two (2) to three (3) months each year (BTI, 2022).

The population of the Douala region has increased considerably since independence. In 2019, the urban population in Cameroon was estimated at 57% with an urban growth rate of 3.59% where the urban population in Douala accounted for 13.9% and

expected to reach 15.1% by 2030 (UN-Habitat, 2022). In 2021, there were an estimated 3,793,363 inhabitants in the city. The average annual growth rate of Douala’s population over the last 40 years (1964-2005) has been +5.3% with projections estimating that this population will reach 6 million inhabitants by 2035 (World Population Review, 2022). The demographic distribution shows around 10% children under six years, 12% youth (from 7-17 years), 43% adults until 59 years, 22% that reached the age of 60 and older, and only 1.2% above the age of 80 (BUCREC, 2020).

Although Cameroon is described as a hard-line autocracy with weak governance structures and a limited economy (BTI, 2022), the governance of Douala entails a combination of two systems: a modern political system, represented by an elected Mayor who exercises political authority, and a traditional cultural system, represented by a hereditary King who performs symbolic and cultural functions.

The city’s administrative structure consists of six districts, each headed by a district chief, and 47 quarters, each headed by a quarter head. Bertelsmann Stiftung’s Transformation Index as shown in Figure 3 shows that although the economic transformation of Cameroon is faring well at 4.61 out of a scale of ten, the political transformation is at 3.62 giving an overall governance index of 3.95.

One of the areas that is rendering difficult in governance is the duality in ownership of land. The presence of the indigenous chiefdoms and kingdoms have made it increasingly difficult for planning authorities to implement various masterplans and urban design strategies as land in these areas is owned by the Chiefdoms and Kingships (Denis, 2011). Hence the government finds it difficult to enforce laws and development guidelines as the land is owned and sold by negotiation from the owners of land to respective buyers.

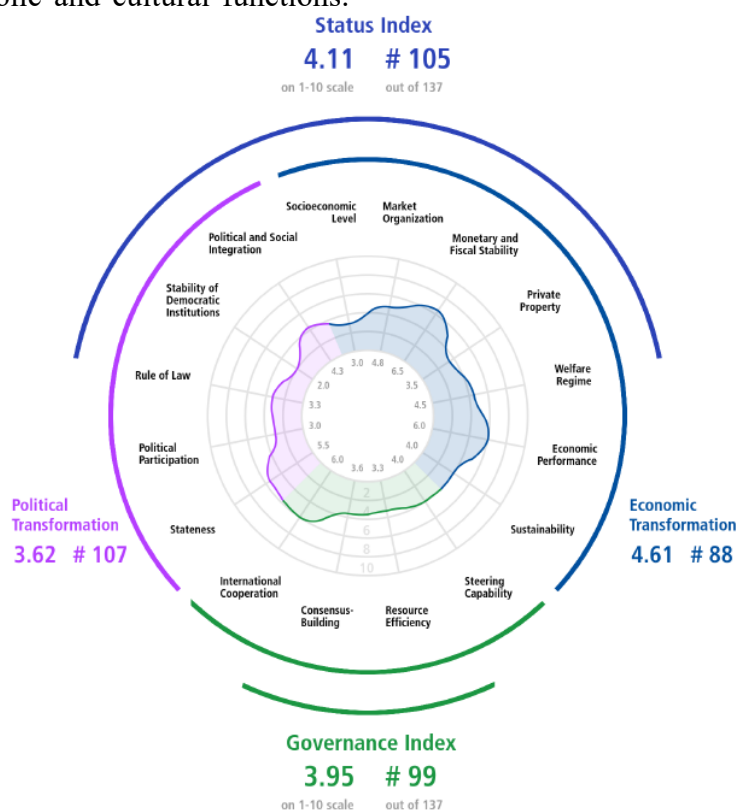


Figure 3: Bertelsmann Stiftung’s Transformation Index – Cameroon (BTI, 2022).

### History of Urbanization



The agglomeration of Douala, the largest city in the Republic of Cameroon, differs significantly from the political capital, Yaoundé, in terms of its functions, appearance, and mindset. The area of Douala has been inhabited by several ethnic groups for thousands of years. Its name originates from the “Duala” people who settled along the Wouri River. Originally, Cameroon was the exonym given by the Portuguese to the Wouri River, which they called Rio dos Camarões meaning "river of shrimps" or "shrimp river", referring to the then abundant Cameroon ghost shrimp. Today the country's name in Portuguese remains Camarões (Pondi, 1997).

Initially, trade operations were conducted from pontoon boats anchored in the middle of the river. Over centuries, it served as a hub for Portuguese, English, and French traders engaged in the exchange of tropical goods and the slave trade with the residents of Douala compelled to facilitate and act as intermediaries (Ottou, 2020). In the second half of the 19th century, maritime trade began to flourish, but also, German, and English commercial enterprises started colonization. After 1884, the name "Cameroon Town" was translated to "Kamerunstadt" (Weber, 2012). Douala was initially the political capital, then replaced by Buea, and finally by Yaoundé. The city of Douala developed at the pace of the economic development of the Cameroonian territory with its port function being the driving force behind its evolution. During the German occupation, Douala was one of the leading trans-African routes; and by the time they were ousted in 1915, the city was a modest port of 100,000 tons of annual traffic, with ships docking at small public and private wharves. The urban population at that time numbered around 15,000 (Gankam & Fondze, 2020). During the interwar period, the French constructed a deep-water wharf and developed the right bank of the Wouri River in Bonassama. By 1939, the city's population had increased to approximately 35,000 residents. It was not until the 1950s

that significant investments began to transform Douala into a port city of African significance. In 1950, annual port traffic exceeded the 500,000-tonne milestone, and the agglomeration increased to 100,000 urban dwellers (Gankam & Fondze, 2020). Furthermore, Douala's growth was driven by its role in financial and commercial transactions with both local and foreign markets; and industrialization increased. National local consumption markets became important. Douala's port and industries played a vital role in serving a larger hinterland, including North Cameroon, Chad, and the Central African Republic. As the port reached its capacity limit, ship rotations slowed down, and traffic peaked at two million tons.

Figure 4 shows the expansion of the city resulting from land-use changes. From a small city area in 1975, the built-up area grew rapidly to deplete the greenery area in the next four decades. By 2015, more than 80% of the total city area is already built-up.

### **Colonialism and Urbanization: Douala's History from 1881**

Anglophone origin cities sprawl compared to Francophone ones. Anglophone cities have less intense land use and more irregular layout in the older colonial portions of cities, and more leapfrog development at the extensive margin (Henderson *et. al.*, 2017). The British operated under indirect rule and a dual mandate within cities, allowing colonial and native sections to develop without an overall plan and coordination. In contrast, integrated city planning and land allocation mechanisms were a feature of French colonial rule, which was inclined to direct rule (Henderson *et. al.*, 2017).

Cameroon however was first colonized by the Germans, then the land was later colonized by the British and the French. This meant that each of the three colonizers left a long-lasting impact on the area they colonized in terms of urban zoning, infrastructure and mode of governance.

Cameroon further has the French-speaking and English-speaking nationals hence the effect of colonialism is deep rooted in the country's governance, operations and urban form. Cameroon is a unitary state today, with a Francophone majority, but it

has a separate education subsystem in its Anglophone part. Local protests to defend the Anglophone specificity began in 2016 and have since turned into a violent conflict (Dupraz, 2019).

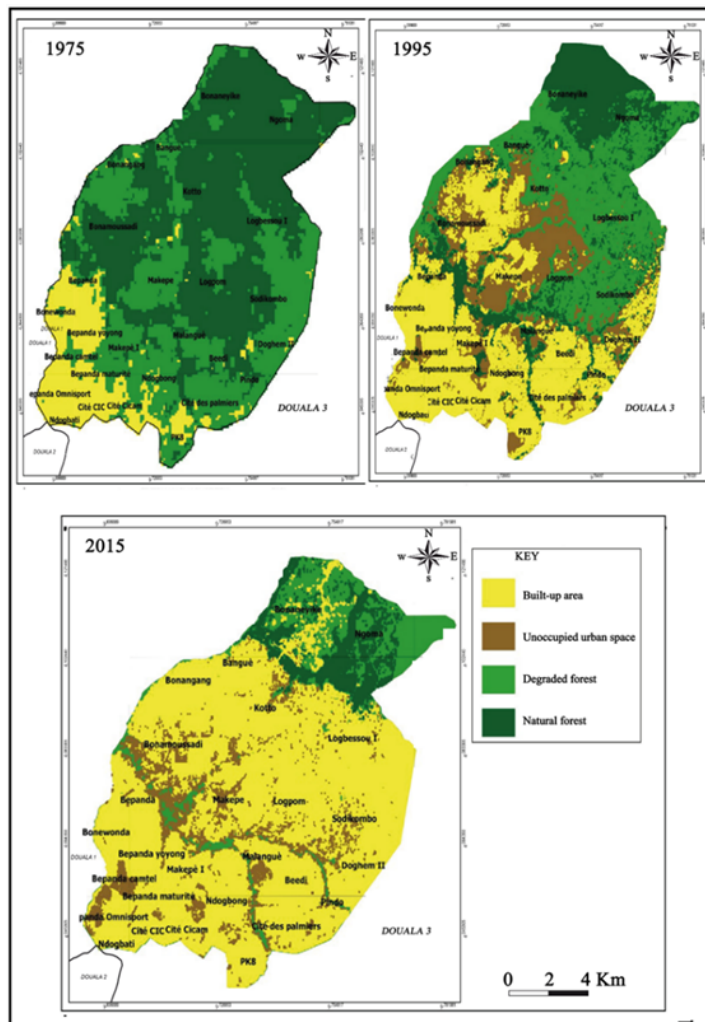


Figure 4: Land use progression from 1975 to 2015 in Douala region (Sources: 1975 Landsat, 1995 Spot, 2015 Landsat Satellite images as cit. in Renz, 2018).

#### German protectorate: 1881-1914

The development of the port in Douala traces its origins back to 1881 when the German company Woerman Linie, in collaboration with the Douala kings, had negotiations with Governor J. von Puttkamer (Wilcox, 1994). This partnership started port infrastructure in the region. The choice of Douala as a port site was motivated by its geographical characteristics,

particularly the absence of any sandbar in the Wouri estuary, which facilitated maritime trade (Wilcox, 1994).

In 1884, following the Berlin Conference, that partitioned Africa, Germany officially occupied Cameroon and made Douala its main base. The German project for the organization of urban space of the city of Douala was based on the development of three plateaus which served for the colonial administration and allocation for European settlers, while the indigenous population

was relocated to the east. The three districts, each situated at the Wouri estuary, were Joss, Akwa and Deido (from south to north). Beyond these plateaus, the surrounding areas, are often characterized as marshy and poor. The area formed the backdrop to the city's development. The relocation placed the indigenous population a few kilometres away from the European city, with a buffer zone of approximately 1 kilometre, known as the "freie zone," completely encircling the European city (Figure 5). Consequently, the city parts were renamed New-Bell (originally Bell), followed by New Akwa and New Deido (Ottou, 2020; Schler, 2005; Njoh, 2002). This spatial arrangement was part of the broader strategy employed by the German colonial oppressors in the late 19th century to segregate and control different population groups within the city. A focus of the German urbanization strategy was the construction of infrastructure, with some remaining impacts until today. This included the establishment of a railway terminus connecting Douala to Yaoundé,

positioned at the mouth of the Besseke River. The station was completed in 1920, after German oppression had stopped, and was given to the next colonialists. Particularly in the Joss plateau, administrative buildings and infrastructure were created, mainly because of its location overlooking the Wouri. Several administrative buildings were built at this time and remain today (Schler, 2005). The first masterplan of Douala is given in Figure 6.

The German shaping of Douala stopped with the outbreak of World War I. The war caused a change of colonial control of Douala from Germany to the Allies. The first violent eviction operation took place in 1914, shifting the indigenous population from the Joss plateau to the New-Bell district. The colonial rule, conflicts and disputes with Germany and subsequent change of colonization affected the land management, urban planning and especially distribution of civilization in Douala (Donald, 2009; Schler, 2005).

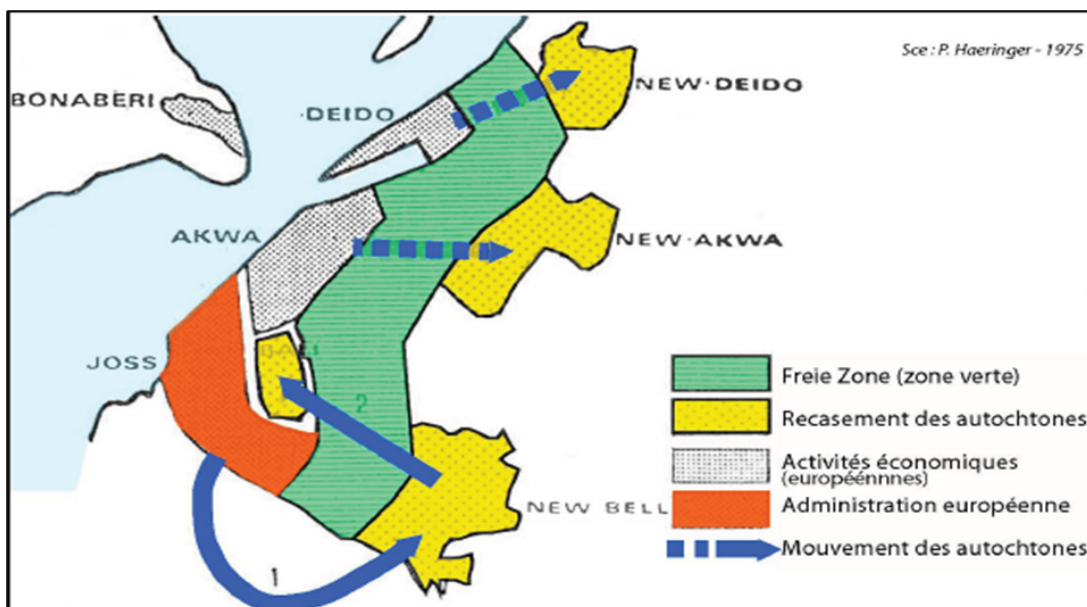
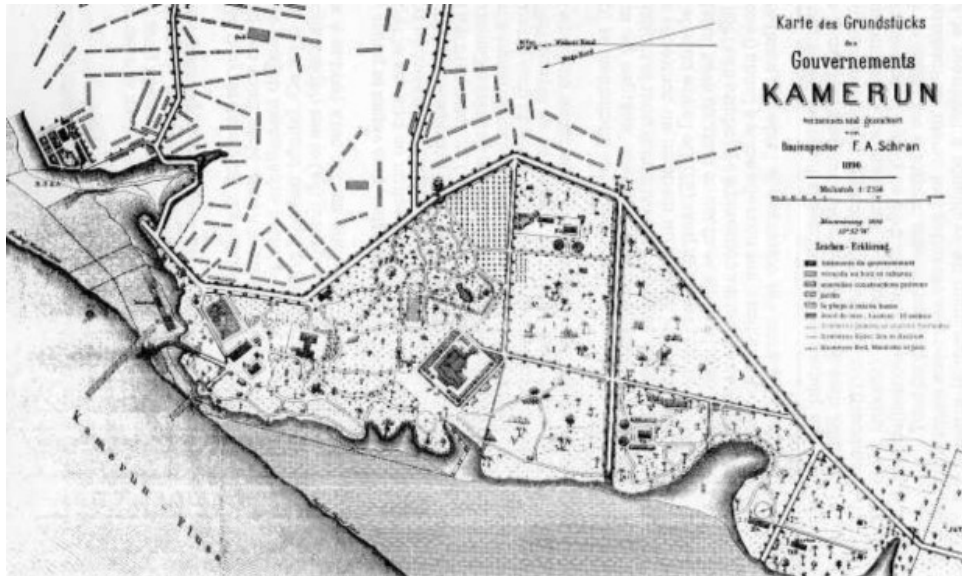


Figure 5: First Cameroon urban plan by German (Source: UMP, 2025).



**Figure 6: First modernist urban plan of German colonial Cameroon, Douala Joss Plateau, in 1890. (Communaute Urbain de Douala, 2009 as cit. in Njoh & Bigon, 2015).**

### The French colonial period: 1914-1959

After Germany was defeated in World War I, German Cameroon was divided into two mandates: France was given the eastern zone, which included Douala. The remaining area became British protectorate. Under French colonial administration, French became the language of administration, education, and governance. Initially, France followed the spatial plans set up by the German rule: Joss plateau remained the administrative district. European residents stayed in Akwa and Deido. However, the colonial administrators abandoned the German "freie zone": It was no longer separate but integrated into the city planning. The initial urban planning followed the French style of city planning that included a clear separation of districts for administration, living and commerce (Elate, 2004).

However, unlike the other towns in its African colonial empire, the French administration had to consider the town's particularly delicate land situation, inherited from the period of the German protectorate. Therefore, in 1932, a significant development occurred in land ownership and property rights in Douala. The colonial administration recognized that local individuals had individual ownership

of their customary land. This recognition was formalized through the institution of registered land titles, which granted individuals the legal right to engage in transactions involving their land. This change marked a shift in the legal framework governing land ownership in Douala (Loh, 2023).

At this time, Cameroon's land law was based on two principles: recognition of acquired rights (or "recognition" of customary rights) and land registration. Under this framework, customary chiefs played a significant role in land management, particularly in areas where European influence and pressure for land were pronounced. Additionally, as migration from other parts of the country increased, customary chiefs were instrumental in managing land allocation and transactions (Wily, 2011).

Historically, private property in Douala did not come from the State's private domain. Before independence, this principle was applied to European homes and businesses, which gradually extended beyond Joss, from Bonanjo to Akwa. Land remained owned by the Douala people. The occupants were therefore tenants and had leases (particularly for industrial activities); property profits constituted a significant



source of income. The expansion of working-class and unregistered neighbourhoods in Douala, characterized by a lack of urban planning policies, led to a decrease in segregation within the city. This phenomenon occurred in tandem with the development of the port and the repopulation of Douala's original neighbourhoods. The colonial administration pursued a policy of encouraging people from various regions, including Bassa and Bamileke to settle, initially in the New-Bell neighbourhood (Ngoran *et. al.*, 2015). After the Second World War, Douala experienced a significant influx of migrants due to the growth in port traffic and economic opportunities in the city (Tambe, 2022). The bridge over the Wouri was opened in 1955; the airport opened in 1958.

Following this, the population was estimated to be 130,000 inhabitants, of whom only 24,000 were from Douala (Tiafack *et. al.*, 2014). The neighbourhood of New-Bell, which had initially been encouraged for settlement by the colonial administration, had, by this time, faced challenges and was often characterized as an "urban disaster." The rapid growth and informal settlement in areas like New-Bell highlighted the need for urban planning and infrastructure development to accommodate the burgeoning population. During the French colonialism period, two Douala plans were developed – the Calsat plan of 1950 and the Dorian plan of 1959 (Figure 7). The Dorian plan was taken as the only urban development document to be used by the newly independent government in 1960.

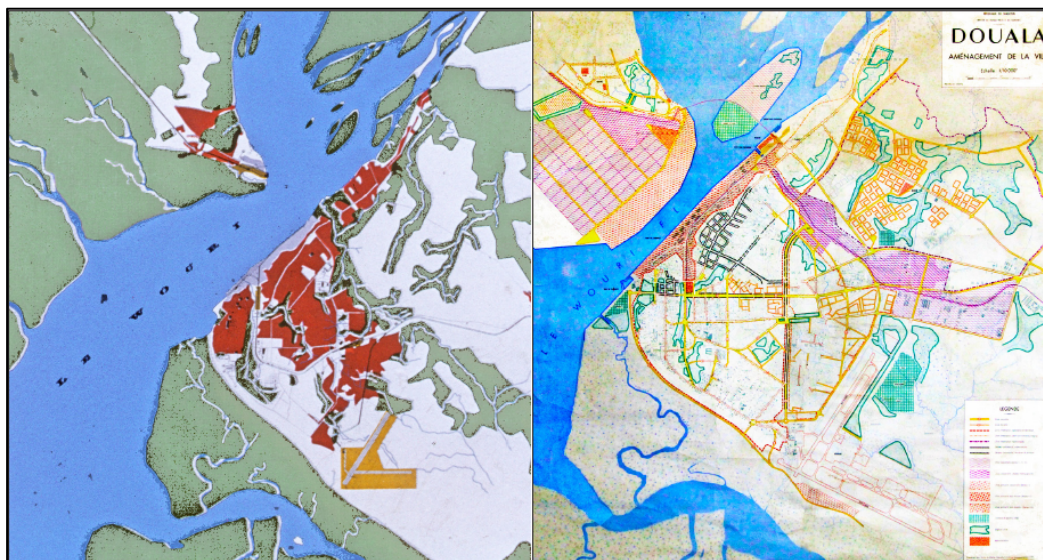


Figure 7: Calsat plan in 1950 (left) and Dorian plan in 1959 (right) (Noubouwo, 2014).

### Post-independence: 1959-today

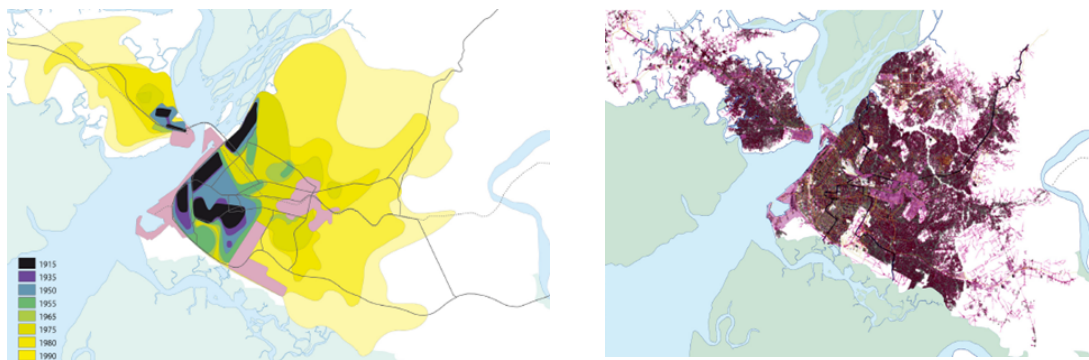
Urbanization after independence occurred without a structured system of land tenure, largely due to resistance from local communities who considered the land as their own, much like earlier situations in the Akwa and Bonadoubé districts. The lack of a formalized land tenure system in the rapidly urbanizing areas created tensions between local communities and migrants.

Local communities viewed the land as their own, rooted in their historical connection to the area, while migrants sought opportunities in the expanding city. Conflicts between customary land practices and the influx of migrants complicated land ownership and land use issues. Traditional customary practices often clashed with the needs and expectations of migrants and the evolving urban landscape.

The "foreign town" spread very quickly to Bassa and on the Deido side, partly orchestrated by the customary landowners concerned, with an effort to set up gridded housing estates with large plots and single-family dwellings (Chenal, 2014). These subdivisions were built without policy where the 1959 Dorian Plan is the only regulatory document available to the authorities. The Douala Urban Community (DUC), which replaced the Douala Commune, created four arrondissement communes. The DUC confirmed its role in urban planning and land management with the creation of the SAD (Society for the

Management of Douala) in 1998 (Chenal, 2014). However, these operations remain marginal in relation to the challenges facing Douala today in terms of managing expansion, restructuring of older neighbourhoods and equipping intermediate neighbourhoods.

Figure 8(a) shows the expansion and development of the city of Douala, that started as a very small district along the estuary of the river in 1915 (in black) to the sprawl of 1990 (in yellow). Figure 8(b) on the other hand shows the distribution of people in the year 2000.



**Figure 8: (a) Spatial evolution of urbanization since 1915 to 1990. (b) Urban population for 2000 (UMP, 2025).**

Both figures show the urbanization as well as the sprawl of the city up to the year 2000. In the early 2000, new laws and plans were proposed. The 2004 laws on urban planning and decentralization have had a significant impact on urban management in Douala, particularly through the involvement of the Douala Urban Community (DUC) and the districts in the city's development. However, acting on existing neighbourhoods and reaching agreements with locals for the development of new areas, have become the main challenge facing the city in terms of housing management even though the decentralization of responsibilities allowed for more localized decision-making and planning.

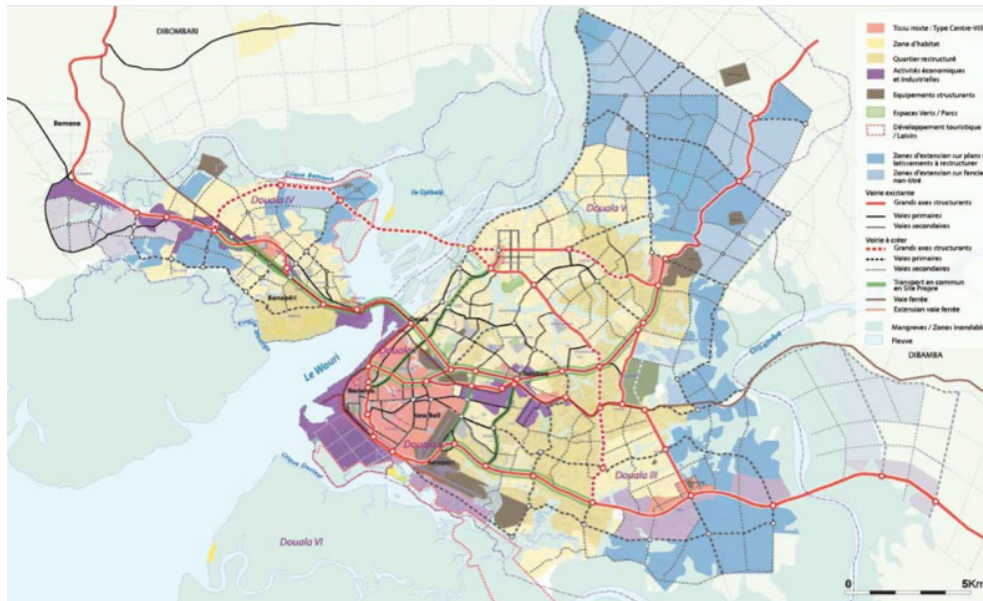
### Contemporary Urbanization

Existing or partially developed urban development areas by 2014, were estimated at around 25,700 ha. They were estimated by the Urban Development Master Plan (SDAU) in 1983 at around 20,000 ha (Chenal, 2014). The specialization of districts within the modern city of Douala is evident, and the city can be divided into distinct sectors, each serving different functions and housing diverse populations. The modern city of Douala has two distinct sectors: the Akwa district serves as commercial and economic centre, including the port and several shops and businesses whilst Bonanjo is the administrative plateau of Douala. Pericentral neighbourhoods envelop the downtown towards the east, juxtaposed with neighbourhoods populated by natives and/or migrants. Towards the periphery, in an external halo, the succession of





continuously, it likely became denser in these newly developed areas.



**Figure 10: Influence of transport network to the development of Douala (Le Arteliers, 2013).**

While Douala's urban fabric exhibits coherence and development, undeveloped land and challenges related to spontaneous and poorly managed habitats increase. These informal settlements lack proper planning, infrastructure, or sanitation facilities, which can lead to problems with systematic drainage and flooding during periods of heavy rainfall. Some parts of the city, there are areas such as Bepanda, Nylon, Maképé, and Bonabéri, where spontaneous popular habitats have emerged, in contrast to the neighbourhoods in the south and west, including City SIC, Bonapriso, and Bonanjo, that are well-delineated and planned.

Overall, Douala's economic activity is characterized by its intensity and diversity, setting it apart from Yaoundé, which primarily serves as an administrative centre. Commercial buildings play a significant role in shaping the city's architectural landscape. Behind the harbour, the old warehouses; obsolete buildings, large old import-export companies are written off. The construction of taller and more prestigious buildings, ranging from 5 to 12 floors in Douala reflects the city's ambition for growth.

Several commercial buildings are planned and under construction, i.e., the new agency of the Cameroon Airlines (Camair-Co), the new building for the Social Security Fund, and the National Office of the Marketing of Products (ONCPB).

In summary, initial urbanization plans have been restrictive and have been surpassed by reality. The rapid urbanization faces challenges to meet the needs for sustainable, inclusive, and healthy urbanization. The discrepancy between the original Urban Development Master Plan (SDAU) in Douala, as defined in 1983, and the actual situation on the ground, highlights the challenges of urban planning and development in a rapidly growing metropolis such as Douala. Managing and integrating the diverse urban elements while addressing issues of infrastructure, land tenure, and urban planning remains a key challenge for the city's authorities and urban planners.

### **Sustainable Urbanisation in Douala**

Sustainable urbanisation refers to the development and management of cities in a way that addresses environmental, social,



and economic challenges while promoting long term viability. The notion of “sustainable urbanisation” takes a view that recognise the regional, national and global significance of an urban area whilst defining and achieving the desirable state of sustainability (Roy, 2009). It involves creating urban spaces that minimize resource consumption, prioritize green infrastructure, foster social inclusivity and support economic resilience. The goal is to envision cities that are environmentally friendly, socially equitable and economically viable for current and future generations.

### **Sustainability and urbanization**

Sustainability incorporates the crucial characteristic of long-term endurance. As defined by Cambridge University Press (2019), it is the belief that commodities and services should be produced in a manner that preserves finite resources and does not damage the environment. In addition, sustainability is ecologically defined as the capacity of biological systems to maintain diversity, vigour, and productivity over time, which is an essential condition for the well-being of humans and other species (Kopnin & Blewitt, 2018).

The concept of a sustainable city refers to the current conditions of cities, emphasizing eco-environmental preservation, prudent resource utilization, individual well-being, and the satisfaction of fundamental human needs (Shen *et. al.*, 2011). A sustainable city is an economic space where complex social, economic, and ecological challenges are managed proactively and strategically (Whitehead, 2003). Alternatively, sustainable urban development is a dynamic, ongoing process emphasizing social, economic, environmental, and governance sustainability in equal measure (Shen *et al.*, 2011). It entails holistically incorporating these diverse aspects into the urbanization process to ensure long-lasting and sustainable progress.

The growing emphasis on sustainability catalyses transformation within the construction industry and the administration of the built environment (Klemes, 2015). The built environment significantly influences human and environmental health (Bardage, 2017), therefore, a significant imperative exists for a sustainable built environment to propel progress. To realize this vision, incorporating sustainability concepts in the design and their continuance throughout the building procurement process are essential.

### **Sustainable urbanization concepts vs. Douala’s rapid urbanization**

The significance of sustainable development has been emphasized in the urbanization processes of countless cities and nations in recent years. Sustainable urbanization, as defined by the principles of sustainable development (Roy, 2009) resides at the intersection of urbanization and sustainability (Bugliarello, 2008). The sustainable city and sustainable urban development are two distinct levels (Rasoolimanesh *et. al.*, 2012). The main difficulty in sustainable urbanization is the rapid global urbanization boom caused by accelerated population growth (Pomponi & Moncaster, 2017), rural-to-urban migration and changes of economic systems. Cameroon, specifically the city of Douala, is not an exception to this pattern.

Unchecked urban population growth and decentralization have spawned a variety of issues, such as social inequality, informal settlements, land scarcity, and climate change (Marshall & Farahbakhsh, 2013; Simon & Adam-Bradford, 2016; Milano *et. al.*, 2020). Collectively, these issues cast a shadow on the city’s pursuit of sustainable development and ultimately sustainable urbanisation. Main challenges include informal settlement and uncontrolled urban sprawl, unregulated extension development, inadequate urban transportation and congestion, and lack of administrative order.

### **A closer look on uncontrolled urban sprawl**

Spread in the strict sense is measured primarily from a demographic point of view. This demographic change is projected in land use. The process of spreading the city of Douala has been identified for several years as a harmful phenomenon for its agglomeration. Inexorably, the city continues to spread under different urban dynamics with determinants that contrast with planning tools developed to organize urban development. The urban footprint of Douala has more than doubled over the last 30 years. The city is found to be developing within a rapid and uncontrolled expansion, with a large area of informal housing, often on non-buildable land (UN-Habitat, 2022). The city is also experiencing lack of good and quality transport network and basic services especially in the informally built areas (Loe & Albert, 2004).

This large increase in the urban population is sustained by a multifunctional migratory phenomenon, and above all, by the migration of asylum from poverty, where people who come every day from the countryside and conflict zones invent networks and illegal practices that compromise the effectiveness of a real urban policy.

The lack of resources to implement planned projects, the failure to respect the rules of urban planning and construction as well as the non-involvement of the populations, who have always perceived urban planning as a means of domination and exclusion that do not respect their habits and customs, were at the origin of a disordered and extensive spatial development. Here, the demands and perceptions of housing conditions are changing necessarily according to the technical, economic, and social development accompanying the consequent changes in habitat types, lifestyles and associated socio-cultural perceptions.

On the one hand, it is essential to separate housing from the living environment in which it must register. Traditional habitat quality criteria based exclusively on convenient indicators are increasingly marginalized. As a result of proactive practices, the city of Douala presents itself as a juxtaposition of fabrics, corresponding to the different times of its history. A “fragmented city” made up of fragments or strata that are juxtaposed without real coherence: fragments of colonial and traditional centres, reconstructed neighbourhoods, large complexes of the 1970s and 1980s, subdivisions of the 1980s, 1990s and 2000s, small public operations or private promotions in the interstices of previous spaces. This production by fragments shows a strong urban disorder that is at the origin of a breakdown of the urban landscape and the aesthetics of the city.

## **RESULTS AND DISCUSSIONS**

### **Insight: The Public Space in Douala, Territory of the Informal**

When one first arrives in the city of Douala, one is immediately struck by the anarchic occupation of space, which makes it difficult to distinguish between public space and private space. Indeed, as soon as we realize that a space is unoccupied in the city, which knows a constantly increasing demography, it is rare not to find someone to exploit it in one way or another. We even have the impression of witnessing a race to exploit public spaces by individuals.

The visibility of activities belonging to what we have come to call the informal is one of the most striking and recurrent figures. Here, the occupation of physical public space poses the problem of its occupation by informal commerce and the related allocation procedures. This concerns both itinerant or street vendors, small traders and the owners of drinking establishments distilling music at will, restaurants, sewing workshops,

hairdressers who set up stalls or kiosks on the estate.

The presence of open-air garages on sites reserved for green spaces, on sidewalks and central reservations of paved roads, the fanciful parking lots of motorists, the proliferation of religious communities, including prayer practices with noise emissions, in the name of freedom of worship, considerably disturbs the neighbourhood, in defiance of the neighbours' right to tranquillity. An uncontrolled number of motorbike drivers cause road insecurity in the city.

In most districts, there is no longer a clear demarcation between residential and commercial districts. Activities are developing in all interstices of the city without any real control or constraint from the authorities.

The speeches of actors concerned by the conflicts of space show that the practices are divided between legal procedures and anarchic occupations which legitimize a social power on space. The lack of civic engagement fosters a deep-seated scepticism towards authority, perpetuating and prolonging this phenomenon. Similarly, society does not repress with the necessary severity. Certain forms of deviations, such as the development of a behaviour of total disrespect towards the norm because of numerous manifestations of collective life, where there reigns a tense atmosphere, impregnated with selfishness, casualness and often rudeness. These types of behaviour are very often the result of certain uneasiness that may exist between the individual and society and can give rise to other dangers.

Faced with the magnitude of this situation, which dishonours the city of Douala, the local authorities are trying to curb the problem. The will of the State to enforce its control and its power over the organization of the city vis-à-vis the "people", who conceive the occupation of places as free, and there is no clearly identified limits, is coupled with a problem of allocation of spaces, methods of allocating land,

administrative reserves, and the destination of these places.

But when the discipline of the populations cannot be obtained by sensitization and information campaigns calling for good behaviour or the example to be followed, the embellishment of Douala is done by means of energetic actions; salutary, sensitive, and highly unpopular. Thus, the municipal police in the perspective of a better control of the city generally resort to the practice of raids, evictions and major operations commonly described as "punch". These are urban planning operations, restructuring the renovation of anarchic neighbourhoods established in total disregard of topographical conditions, investing in turn steep slopes, lowlands or un-serviced plateaus or settling on poorly drained and sometimes flood-prone land.

In addition, cleaning and combing operations include the release of public rights-of-way with the confiscation of goods and the sealing of illegal businesses, the impoundment of cars or motorcycle taxis parked outside the spaces marked out for this purpose or abandoned on sidewalks or central medians, and the demolition of constructions undertaken without a building permit. Chasing out troublemakers to urban order reassures populations and discourages potential repeat and recalcitrant offenders. Implicitly, the action also makes it possible to square the space, to classify its actors there and to control them even if the defendants very often find the means of clearing customs invoking unemployment and the hardness of life.

Therefore, the occupation of space being the main constituent element of these disorders, the challenges of urban planning in a current context of crisis of decentralization arise for the municipalities.

### **Possible Solutions and Interventions for Douala City**

The challenges experienced in Douala city are complex and intertwined in different levels and dimensions. Sustainable

planning and construction can be a tool to assist sustainable development and consequently sustainable urbanization. Implementing these sustainability strategies requires collaboration between government agencies, local communities, businesses, and other stakeholders. By adopting a sustainable development framework, Douala can pave the way for a resilient, equitable, and thriving urban environment.

### **Integrated Urban Planning and Transportation**

Apart from strategies related to urban planning and sustainable construction, cities such as Curitiba in Brazil and Portland in the United States have demonstrated the positive outcomes of involving local communities in urban planning (Noubouwo, 2014). Engaging citizens ensures that urbanization decisions align with the needs and concerns of the population, fostering a sense of ownership and creating more inclusive and sustainable urban environments (Kopnina & Blewitt, 2018).

Many successful urban centres worldwide have embraced comprehensive urban planning policies that prioritize sustainability and green building practices. Cities such as Copenhagen, Denmark and Vancouver, Canada, have implemented policies promoting renewable energy sources, low-carbon transportation options, and green infrastructure. This approach not only addresses environmental concerns but also enhances overall urban resilience and liveability.

Addressing challenges such as infrastructure, transportation of people and goods demands specific attention. Learning from successful models implemented in other nations provides valuable insights and benchmarks, offering Douala the opportunity to create a resilient and environmentally conscious urban landscape for its residents.

Research shows that one of the most important strategies for sustainable

urbanization is development of city planning policies that integrate land use plans with transportation (Dargahi *et al.*, 2021; Spirin & Enin, 2022; Ilchenko, 2021). Understanding the dynamics between settlements, informal settlements especially, with transport habits and options is essential. Redevelopment of informal settlements that incorporate mixed land uses including housing, retail, offices, open spaces, light industries and walkable streets (Carlton, 2009; Fourchard, 2006) will reduce transport distance and time.

Moreover, to enhance public transportation, Douala can benefit from a cost-effective and efficient system. This involves investments in new buses, dedicated bus lanes, and contemporary bus shelters. Drawing inspiration from successful Bus Rapid Transit (BRT) systems in other countries, such as Dar es salaam and Addis Ababa where streamlined and reliable public transportation has significantly reduced traffic congestion and air pollution, Douala can design its system with a similar vision. Translating this vision into reality necessitates robust government support, involving granting decentralized territorial communities, greater autonomy and providing the essential resources to empower local authorities who are intimately acquainted with the needs and challenges faced by their communities. This aligns with the principles of democracy and good governance. Furthermore, addressing urban growth and its associated problems, such as overcrowding, insecurity, unregulated land use, and haphazard expansion into unsuitable areas, requires a fundamental shift in approach. Rational urban development has become a political and economic imperative, and it is crucial for enhancing the living conditions and urban framework for citizens.

### **Sustainable Urban Construction**

Urban engineering emerges as a strategic response to the imperative need for stability



and sustainable development within cities. It entails a focused approach to the structural and formative aspects of urban growth, employing deliberate planning and execution of engineering initiatives aligned with broader urban development strategies. While the rapid urbanization has brought challenges to the city of Douala, the demand for construction also brings an opportunity for sustainable development when policies and strategies are enforced. Two opportunities lie in the use of locally sourced materials and the generation of renewable energy.

The use of locally sourced construction materials has been a successful strategy in various regions. In places such as Mali and India, communities have embraced traditional construction methods and local materials, contributing to cultural preservation and reduced environmental impact. In addition to the low carbon footprint of locally sourced materials, this approach also enhances sustainability by minimizing transportation-related emissions and supports local economies.

The city of Douala has an abundant availability of lateritic soils (Penka *et al.*, 2022) that can be stabilized to make sustainable and cost-effective adobe bricks (Rahman, 1986; Ukwizagira & Mbereyaho, 2023) for low income and affordable housing and in the process educating the society and alleviating poverty. Stabilization of laterite soils can also be done using agricultural wastes and products such as rice husk ash, corn cob ash, cassava starch etc. (Rahgozar *et al.*, 2018; Sanga *et al.*, 2022) that in turn can boost the economy of farming areas near the city.

On the other hand, the use of technological advancement to generate renewable energy on construction sites and buildings can be one of the strategies towards sustainable urbanisation. The geographical positioning of Douala offers ample potential for the installation of photovoltaic systems for electricity generation – for connection to the national grid or for consumption of individual buildings (Molu *et al.*, 2024;

Mfetoum *et al.*, 2023). With the current technological advancement, future high-rise buildings that are major consumers of energy can integrate solar PV technology in building facades, windows and other areas as a means to promote sustainable development as well.

Strategies, such as passive designs for indoor temperature control inspired from local vernacular architecture can also contribute towards sustainable construction.

## CONCLUSION

In conclusion, this paper has delved into the multifaceted history of Douala, examining its evolution from a vibrant pre-colonial settlement to a city deeply influenced by the forces of colonialism. The impact of European powers on Douala's social, economic, and political landscape has left an indelible mark, shaping the urban environment and the lives of its inhabitants. The lens of history has allowed us to comprehend the complexities of the city's development and the challenges it faces in the contemporary era. Moreover, the dual existence of governance systems – modern political system and traditional cultural system of kingship and chieftdom, affects landownership and as a consequence enforcement of land development policies. However, the exploration of sustainable practices offers a glimmer of hope for Douala's future. Recognizing the need for a harmonious coexistence between urbanization and environmental preservation, proposed sustainable practices aim to mitigate the adverse effects of rapid urban growth. From integrated urban planning to sustainable construction, these strategies seek to create a balance that promotes resilience, inclusivity, and environmental stewardship.

As Douala navigates the path towards a sustainable future, it is imperative for stakeholders, policymakers, and citizens alike to embrace these proposed practices. By fostering a collective commitment to

sustainable development, Douala has the potential to redefine itself as a model city that harmonizes its rich history with a progressive and environmentally conscious urban future. In doing so, the city can build a legacy that not only honours its past but also ensures a resilient and sustainable tomorrow for generations to come.

## REFERENCES

- Aretouyap, Z., Abdelfattah, M., & Gaber, A. (2022). Urban sprawl analysis and shoreline extraction in Douala-Cameroon city using optical and radar sensors. *Geocarto International*: 1-13.
- Awasom, N. F. (2003). Anglo-Saxonism and Gallicism in nation building in Africa: the case of bilingual Cameroon and the Senegambia confederation in historical and contemporary perspective. *Africa Zamani*, 11(2): 86.
- Bardage, S.L. (2017). Performance of buildings. In *Performance of Bio-based Building Materials*: 335-383. Woodhead Publishing.
- BTI, (2022). Bertelsmann Stiftung, BTI 2022 Country Report — Cameroon. Gütersloh: Bertelsmann Stiftung.
- BUCREC (Central Bureau of the Census and Population Studies). (2020). Population Census.
- Bugliarello, G. (2008). The engineering challenges of urban sustainability. *Journal of Urban Technology*, 15(1): 53-83.
- Cambridge University Press. (2019). Definition of Sustainability. from <https://dictionary.cambridge.org/es/diccionario/ingles/sustainability>. [Accessed: July 20th, 2021].
- Carlton, I. (2009). Histories of transit-oriented development: Perspectives on the development of the TOD concept: Real estate and transit, urban and social movements, concept protagonist. Berkeley, CA: Institute of Urban and Regional Development, University of California, Berkeley.
- Chenal, J. (2014). *The West-African City: Urban space and models of urban planning*. EPFL Press.
- Cobbinah, P.B., & Darkwah, R.M. (2017). Toward a more desirable form of sustainable urban development in Africa. *African Geographical Review*, 36(3): 262-285.
- Dargahi, M.M., Razaviyan, M.T., & Tavakolinia, J. (2021). Regeneration informal settlements using the transit-oriented development model (TOD) (case study: Hamedan city). *Researches in Earth Sciences*, 12(2): 74-92.
- Denis, F.E. (2011). Chiefs, trade and politics along the coast of Cameroon: a historical perspective. *La chefferie «traditionnelle» dans les sociétés de la grande zone forestière du Sud-Cameroun (1850-2010)*: 101.
- Dhari, L.F. (2020). Area Development Strategy to Overcome the Slums in RW 3 and RW 5, Polehan Village, Blimbing, Malang, Using IFAS and EFAS Matrix Analysis. In *Journal of International Conference Proceedings (JICP)*. 3(4): 24-30.
- Donald, J. (2009). Cameroon at Slideshare. Accessed on January 2024. <https://www.slideshare.net/slideshow/cameroon-1187872/1187872#2>.
- Dupraz, Y. (2019). French and British colonial legacies in education: Evidence from the partition of Cameroon. *The Journal of Economic History*, 79(3): 628-668.
- Elate, S.S. (2004). African urban history in the future. *Globalization and Urbanization in Africa*: 51-66.
- Fourchard, L. (2006). The streets of Lagos: spacesdisputed/shared spaces. Paris: Flow 2006/4-2007/1 (n°66-67), p. 62-72. <https://www.cairn.info/journal-flux1-2006-4-page-62.htm>.
- Gankam, A. D. F., & Fondze, G. B. (2020). Port and Industrial Activities in Douala-Cameroon: Socio-Economic Mutations and Environmental Consequences. *Year XVI, Issue 1/2020*: 48.
- Gifford, P., Louis, W. R., & Smith, A. (1967). Britain and Germany in Africa: Imperial rivalry and colonial rule. *Yale University Press*. New Haven.
- Gollin, D., Jedwab, R., & Vollrath, D. (2016). Urbanisation with and without industrialisation. *Journal of Economic Growth*, 21(1): 35-70.
- Gouellain, R. (1973). Douala: training and development of the city during colonization. *African Studies Notebooks*, 13(51): 442-468.

- Guan, X., Wei, H., Lu, S., Dai, Q., & Su, H. (2018). Assessment on the urbanisation strategy in China: Achievements, challenges and reflections. *Habitat International*, 71: 97-109. <https://doi.org/10.1016/j.habitatint.2017.11.009>.
- Guarnieri, E., & Rainer, H. (2021). Colonialism and female empowerment: A two-sided legacy. *Journal of Development Economics*, 151: 102666.
- Henderson, V.J., Peng, C., & Baruah, N. (2017). Colonial legacies: Shaping African cities. *SERC Spat. Econ. Res. Cent*, 44.
- Ilchenko, S. (2021). Reclaiming the City: A Collective Endeavor. *Dimensions. Journal of Architectural Knowledge*, 1(2): 183-202.
- Kessides, C. (2006). *The urban transition in Sub-Saharan Africa: Implications for economic growth and poverty reduction* (p. 116). Washington, DC: Cities Alliance.
- Kimengsi, J.N., & Fogwe, Z.N. (2017). Urban green development planning opportunities and challenges in sub-saharan Africa: Lessons from Bamenda city, Cameroon. *International Journal of Global Sustainability*, 1(1): 1-17.
- Klemes, J. J. (Ed.). (2015). *Assessing and Measuring Environmental Impact and Sustainability*. Butterworth-Heinemann.
- Kopnina, H. & Blewitt, J. (2018). *Sustainable Business: Key Issues in Environment and Sustainability*, 2nd Edition. Routledge Taylor & Francis Group. pp 4-5.
- Le Arteliers. (2013). Douala, the the patchwork city, How can formal and informal activities share the urban space and cross-fertilize? In *International Workshop for Urban Planning and Development - Douala, Cameroon – from June 22nd to July 6<sup>th</sup>, 2013*.
- Lee, A., & Schultz, K. A. (2012). Comparing British and French colonial legacies: A discontinuity analysis of Cameroon. *Quarterly Journal of Political Science*, 7(4): 365–410.
- Loe, M.F., & Albert, C.M.N. 2004. Diagnostic de la delinquance urbaine de Douala. *Villes Plus Sûres*.
- Loh, N.S. (2023). Land Ownership in Cameroon: An Overview. *International Journal of Law and Policy*, 8(2): 49-73.
- Marshall, R.E., & Farahbakhsh, K. (2013). Systems approaches to integrated solid waste management in developing countries. *Waste Management*, 33(4): 988-1003.
- Mfetoum, I.M., Ngoh, S.K., Mboumboue, É., Tonga, A., & Lissouck, D. (2023). Exergoeconomic analysis of solar photovoltaic power plants: case study in different tropicals zone (Maroua and Douala) in Cameroon. *Energy Nexus*, 10, 100206.
- Milano, C., Novelli, M., & Cheer, J. M. (2020). Overtourism and degrowth: A social movements perspective. In *Tourism and Degrowth*, (pp. 113-131). Routledge.
- Molu, R.J.J., Naoussi, S.R.D., Bajaj, M., Wira, P., Mbasso, W. F., Das, B. K., Tuka, M.B., & Singh, A. R. (2024). A techno-economic perspective on efficient hybrid renewable energy solutions in Douala, Cameroon's grid-connected systems. *Scientific Reports*, 14(1): 13590.
- Ngoran, S.D. (2014). *Socio-Environmental Impacts of Sprawl on the Coastline of Douala: Options for Integrated Coastal Management*. diplom. de.
- Ngoran, S. D., & Xue, X. (2015). Addressing urban sprawl in Douala, Cameroon: Lessons from Xiamen integrated coastal management. *Journal of Urban Management*, 4(1): 53-72.
- Ngoran, S. D., Xue, X., & Ngoran, B. S. (2015). The dynamism between urbanization, coastal water resources and human health: A case study of Douala, Cameroon. *Journal of Economics and Sustainable Development*, 6(3): 167-181.
- Njoh, A. J. (2002). Development implications of colonial land and human settlement schemes in Cameroon. *Habitat International*, 26(3): 399-415.
- Njoh, A. J., & Bigon, L. (2015). Germany and the deployment of urban planning to create, reinforce and maintain power in colonial Cameroon. *Habitat International*, 49: 10-20.
- Noubouwo, A. (2014). *Développement urbain et stratégies d'acteurs dans les quartiers précaires de Douala au Cameroun*. Institut National de la Recherche

- Scientifique (Canada).
- Ottou, B. (2020). The Beginning of Urbanization in Douala (1884-1914). *Revista Universitară de Sociologie*, 16(2): 143-151.
- Penka, J. B., Nana, U. J. M. P., Manjia, M. B., Bomeni, I. Y., & Pettang, C. (2022). Hydrological, mineralogical and geotechnical characterisation of soils from Douala (coastal, cameroon): potential used in road construction. *Heliyon*, 8(11).
- Pomponi, F., & Moncaster, A. (2017). Circular economy for the built environment: A research framework. *Journal of Cleaner Production*, 143: 710-718.
- Pondi, J.E. (1997). Cameroon and the Commonwealth of nations. *The Round Table*, 86(344): 563-570. doi:10.1080/00358539708454389. ISSN 0035-8533.
- Rahgozar, M.A., Saberian, M., & Li, J. (2018). Soil stabilization with non-conventional eco-friendly agricultural waste materials: An experimental study. *Transportation Geotechnics*, 14: 52-60.
- Rahman, M.A. (1986). The potentials of some stabilizers for the use of lateritic soil in construction. *Building and Environment*, 21(1): 57-61.
- Rasoolimanesh, S.M., Badarulzaman, N., & Jaafar, M. (2012). City development strategies (CDS) and sustainable urbanization in developing world. *Procedia-Social and Behavioral Sciences*, 36: 623-631.
- Renz, T.T. (2018). Urban Land Grabbing Mayhem in Douala Metropolitan Local Council Areas, Cameroon. *Current Urban Studies*, 6(2): 243-259.
- Roy, M. (2009). Planning for sustainable urbanisation in fast growing cities: Mitigation and adaptation issues addressed in Dhaka, Bangladesh. *Habitat International*, 33: 278.
- Sanga, R., Kilumile, M., & Mohamed, F. (2022). Alternative clay bricks inspired from termite mound biomimicry. *Case Studies in Construction Materials*, 16: e00977.
- Schler, L. (2005). History, the Nation-State, and alternative narratives: an example from colonial Douala. *African Studies Review*, 48(1): 89-108.
- Shen, L.Y., Ochoa, J.J., Shah, M.N., & Zhang, X. (2011). The application of urban sustainability indicators—A comparison between various practices. *Habitat International*, 35(1): 17-29.
- Simon, D., & Adam-Bradford, A. (2016). Archaeology and contemporary dynamics for more sustainable, resilient cities in the peri-urban interface. *Balanced Urban Development: Options and Strategies for Liveable Cities*: 57-83.
- Spirin, I.V., & Enin, D.V. (2022, February). Distribution of Stops in City's Transport Routes. In *IOP Conference Series: Earth and Environmental Science*, 988(3): 032033.
- Tambe, T.M. (2022). Imbalanced Development of Transport Infrastructure in Anglo-French Cameroons and its Impact on the Political Evolution of the Territories, 1916-2022. *Journal of Human Geography and Regional Development*, 1(1): 1-11.
- Tiafack, O., Chrétien, N., & Emmanuel, N. N. (2014). Development polarisation in Limbe and Kribi (Littoral Cameroon): Growth challenges, lessons from Douala and options. *Current Urban Studies*, 2(04): 361.
- Ukwizagira, G., & Mbereyaho, L. (2023). Strength Assessment of Improved Adobe Brick Using Natural Stabilizers. *Mediterranean Journal of Basic and Applied Sciences (MJBAS)*, 7(1): 14-26.
- UN-Habitat. (2016). World cities report 2016: urbanisation and development—emerging futures. UN-Habitat.
- UN-Habitat. (2022). Urban Planning & Infrastructure in Migration Contexts Douala Cameroon - Volume 1 - Spatial Profile. [https://unhabitat.org/sites/default/files/2022/10/221006\\_douala\\_spatial\\_profile\\_vf\\_compressed\\_0.pdf](https://unhabitat.org/sites/default/files/2022/10/221006_douala_spatial_profile_vf_compressed_0.pdf)
- UN. (2017). World urbanization prospects: The 2014 revision. New York: UN Department of Economic and Social Affairs, Population Division.
- UMP. (2025). Urban planning of the city of Douala by 2025: Report final. Douala: AFD/C2D-CUD, 243 p.
- Weber, B. (2012). *Exploration of Deutsch-Kamerun: A Toponymic Approach*. na.
- Whitehead, M. (2003). (Re) analysing the



- sustainable city: nature, urbanisation and the regulation of socio-environmental relations in the UK. *Urban Studies*, 40(7): 1183-1206.
- Wilcox, R.G. (1994). *The Maritime Arts of the Duala Of Cameroon: Images of Power and Identity*. University of California, Los Angeles.
- Wily, L.A. (2011). Whose land is it. *The status of customary land tenure in Cameroon*. Yaounde, Centre for Environment and Development/FERN/The Rainforest Foundation UK.
- World Population Review. (2022). <https://worldpopulationreview.com/worldcities/douala-population>.
- Yeyouomo, A.K., & Asongu, S.A. (2023). Sustainable urbanization and vulnerability to climate change in Africa: Accounting for digitalization and institutional quality. *Sustainable Development*.
- Zhang, X. Q. (2016). The trends, promises and challenges of urbanisation in the world. *Habitat International*, 54: 241-252.