Arboricultural Journal, 2024
https://doi.org/10.1080/03071375.2024.2426407

Urban forest and sustainability: the historical perspective of Limbe in the Southwest Region of Cameroon

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ABSTRACT

Projected rapid urbanisation and climate change will increase the risk of natural disasters in fragile coastal African cities. Strategically planning and managing the urban forest can help to build resilience. This study aimed to document urban forest development and sustainability in Cameroon using the city of Limbe as a baseline through the classification of urban forest elements; description of their developmental history and assessment of the level of sustainability to inform strategic planning. Data was collected using a forest ethnology approach. Two groups of stakeholders' representatives of public institutions (Group 1), Non-Governmental Organisations and educated indigenes (Group 2) provided oral histories of tree planting. Face to face interviews with 15 stakeholders were conducted guided by semi-structured questionnaires. From these results, there are four types of urban forest. Limbe Botanical Garden (LBG) developed during the colonial era was the most prominent. Municipal authorities by law should create different types of urban forest but their actions have been limited to Roadside Trees (RT) planting. The absence of budget, policy and inventory was responsible for the low level of urban forest sustainability. Increasing awareness of the effectiveness of urban forest nature-based solutions in tackling deadly landslides and floods in Limbe can promote urban forest sustainability.

ARTICLE HISTORY
Received 3 February 2024
Accepted 4 November 2024

KEYWORDS
Urban forest; colonial history; resource management; sustainability; Cameroon

Introduction

African states are projected to be the most urbanised in the twenty-first century. Current population is expected to rise to about 900 billion by 2050. Population increase will be highest in East, Central and West African cities which are also known as vulnerability hotspots (IPCC, 2022). Rapid urbanisation that intersects existing climate change vulnerabilities will further increase the risk of natural disasters like floods, landslides and sea level rise (Ni'mah & Lenonb, 2017). Low elevation, critical, sensitive and fragile coastal cities that usually attract more people (Gulati & Scholtz, 2020) will be the most affected (UNEP, 2021). Even so, poor urban planning and management have failed to incorporate strategies to mitigate projected developmental challenges in African cities. Urban

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development characterised by weak institutions, a colonial political framework and neo-colonialism (Güneralp et al., 2017) has often prioritised the construction of grey infrastructure such as roads and markets with very little investment in green infrastructure (Kronenberg, 2015). However, several studies now project the benefits of green infrastructure as nature-based solutions in building sustainable and resilient cities (sustainable development goals 11 and 13) (Anguluri & Narayanan, 2017; Smart, 2021; Titz & Chiotha, 2019) and hence advocate for their place in urban planning and management at the local level (FAO, 2016).

Urban forests represent the most significant, functional and viable form of green infrastructure (FAO, 2016). They provide ecosystem services such as pollution reduction, microclimate amelioration, erosion control, food, recreation, beautification and medicine necessary for human well-being (Chekuimo, 2017; FAO, 2016). A sustainable urban forest is one that has been planned and managed to ensure the continuous delivery of ecosystem services (Clark et al., 1997; Monteiro et al., 2019). Strategic urban forest planning (Amini Parsa et al., 2019) based on the assessment of data of the current condition of urban forest has been very effective in promoting urban forest sustainability in advanced countries (Yao et al., 2019). These best practices could be copied by African governments (Charlie, 2012) especially now when national developmental strategies (Cohen-Shacham et al., 2016; Lobe Ekamby & Mudu, 2022) are considering the incorporation of urban forestry in tackling rapid urbanisation.

In some cities in Africa, urban forestry is a relatively new concept, prioritising the use of tree inventory data that contain more technical forestry information to advocate for urban forest sustainability may be enigmatic to mayors or urban planners with little knowledge in environmental science (Ordóñez & Duinker, 2010). Nevertheless, non-technical information is preferable to increase awareness and guide eventual strategies by municipal authorities before moving to in-depth tree inventories. Non-technical assessments consider human factors like history (Roman et al., 2018), management practices (Dwyer et al., 2003; Jim & Liu, 2001) and ownership (Ordóñez & Duinker, 2010).

Urban forest history traces the origin and the extent of human interference with the urban forest structure, available species and species distribution (Hunte et al., 2019; Pataki et al., 2021). Studies highlight colonialism as the main driving force of urban forest development (Hunte et al., 2019; Shackleton & Gwedla, 2021). Hunt et al. (2019) reported that, multiculturalism induced by colonial occupation has influenced plant species distribution and diversity in the tropical Anglophone city of George Town, Guyana. Similarly, Shackleton and Gwedla (2021) revealed that colonial legacies underpinned inequalities in public green space availability, species distribution and use across different settlements in South African cities. Colonial heritage also impacted on the development of management policies of natural, community or urban forest in the post-colonial state of Cameroon a territory initially colonised by Germans but later handed to the French and British after the First World War (Movuh, 2012).

According to du Toit et al. (2018), interest in urban forest research has been slow in Africa with Central Africa representing the lowest number of research publications (7.6%) unlike South Africa (42.8%). In the same study, Cameroon had the highest number with three out of the seven publications coming from Central Africa, but none of these studies provides a clear picture of the current state and level of sustainability of urban forest in Cameroon cities. One related study that analysed urban development as the

cause of the disappearance of tree cover (Nkwemoh et al., 2017) recommended the inclusion of urban forest management into forest policies.

To encourage evidence-based decision-making, the Cameroon government has highlighted the need for more information and data on urban afforestation activities in the Cameroon National Development Strategy 2021–2030 (NDS, 30). Providing baseline information will improve understanding of the current state and sustainability for effective strategic planning (Feltynowski et al., 2018). This paper aims to document urban forest development and sustainability from a historical perspective using the city of Limbe in Cameroon as a case study. The specific objectives of the study were: (1) to classify the different urban forest elements; (2) to describe the developmental history of the most prominent urban forest elements and (3) to assess urban forest management and the level of sustainability.

Materials and methods

Limbe is a coastal city and the headquarters of Fako Division, Southwest Region of Cameroon. The British Baptist missionary Alfred Saker founded Limbe in 1858 and named it Victoria after the queen of England (Njoh et al., 2022). The city covers a surface area of 549 km^2 and has three sub-divisions: Limbe I, Limbe II and Limbe III headed by elected municipal council mayors (Figure 1). There is also an elected city council mayor who oversees urban planning and developmental activities of the municipality. The city is located at latitudes 3° 201 and 4°151 north of the Equator and between longitudes 8°151and 9°351. The city has tropical vegetation and land use consists of residential, agricultural, industrial, commercial, social amenities and forest (Nguh, 2013).

It has a population of about 200,000 inhabitants with 220 people per km^2. The petroleum refinery (SONARA) and the large oil palm plantations of the Cameroon Development Coroporation (CDC) have attracted many people to the city (Wung & Tongwa Aka, 2019). It is highly cosmopolitan with *bakweri. Isubu*, and *Creoles* making up the indigenous inhabitants (Ndille & Belle, 2014). The beautiful coastal beaches, historical monuments, Botanical Garden and Wildlife Centre continue to attract many visitors and tourists. Since the onset of the armed sociopolitical crisis in the North and Southwest Regions of Cameroon that began in 2016, the city has witnessed a substantial increase in population. About 150,000 out of the 179,000 Internally Displaced Persons (IDPs) (World Bank, 2021) live in Limbe which is considered to be safer. Urban sprawl and poverty have pushed IDPs to hilltops and slopes prone to natural disasters. The city was selected owing to its peculiar history as a slave trade route and as a colonial government administrative centre (Njoh et al., 2022) that has influenced current urban planning including urban forests.

Sampling and data collection

Data collection was done based on forest ethnology an emerging qualitative research design, that can effectively generate empirical data on urban forest dynamics, land use history of forest patches, and neighbourhood changes from stakeholders (Ogden et al., 2019). It applies research techniques such as in-depth interviews and oral history, and

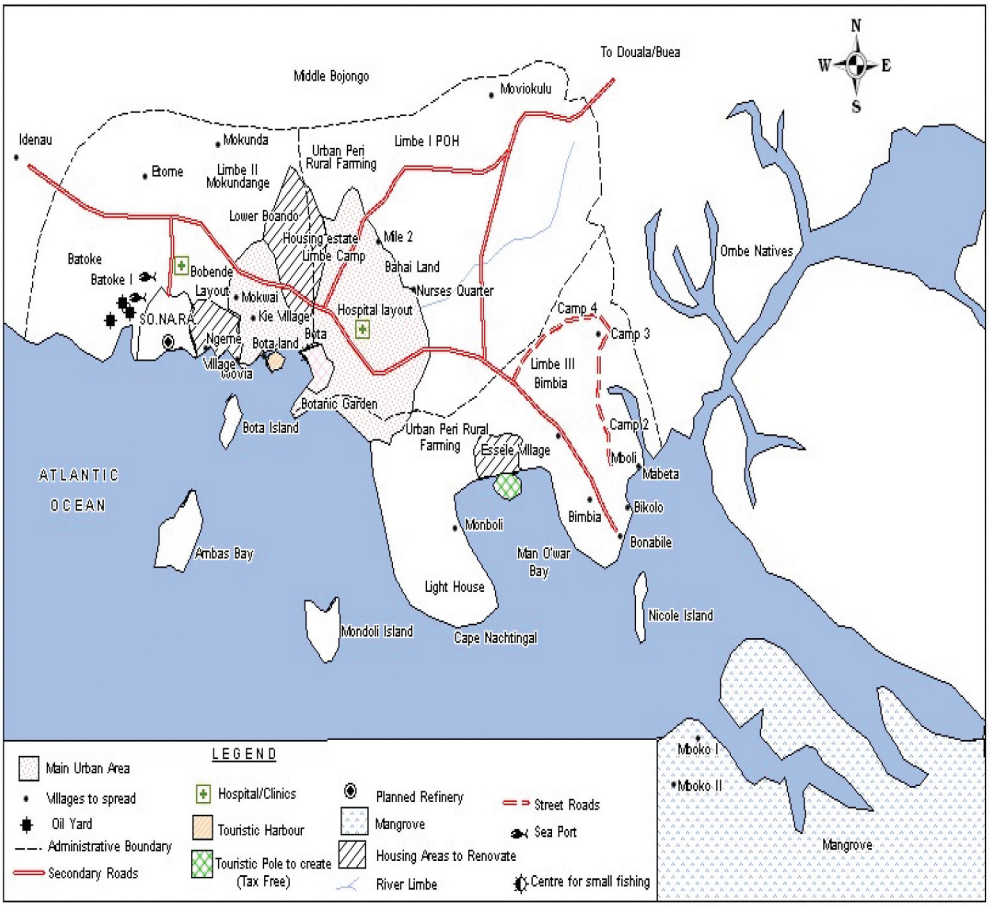

Figure 1. Limbe municipality showing the three sub-divisions.
Source (Nguh, 2013).

incorporates several theories like environmental justice, environmental management, environmental advocacy and sustainability.

Urban forest elements were identified as land uses with trees as the dominant vegetation. Lines of trees planted on both sides of major roads in the city were considered as roadside trees. Major roads were the main transport network of the city usually tarred and characterised by frequent movement of taxis, bikes and other vehicles. An appraisal of archival material was performed to find out how the municipal authorities or previous researchers have classified the urban forest.

To document the history of key urban forest elements both primary and secondary sources were used. Visits to the city council and snowballing helped to identify and map out two groups of stakeholders. Group 1 stakeholders were from public institutions like councils, the Cameroon Development Corporation (CDC), the Botanic Garden and the Divisional Delegation of Forestry and Wildlife. Representatives of institutions and persons heading environmental departments were prime targets. Group 2 embodied stakeholders of tree planting Non-Governmental Organisations. Two old but educated

indigenous people who have lived in the city for more than twenty-five years provided an oral history of tree planting. Fifteen stakeholders were interviewed with ten (10) from Group 1 and five (5) from Group 2. Selected stakeholders acted as key informants. Semi-structured interview guides were used to conduct a face-to-face interview with key informants from both groups and answers were recorded with a cell phone. The semi-structured interview guide captured information on the socioeconomic characteristics of the urban forest including ownership, developmental history and management activities. Urban forest prominence was determined from visual observation of structural parameters like number of trees, size, age and canopy cover. Management information acted as a basis to assess and compare urban forest sustainability levels.

Data analysis

The study considered only publicly managed urban forest elements identified as open spaces within the built environment with trees as the dominant species. A descriptive classification was proposed based on land use and history. Historical grouping permitted comparison of pre-colonial and government approaches towards urban forest development. Interviews were transcribed manually to provide a detailed descriptive narrative of the developmental history, use and management of key urban forest elements. From literature, seven management criteria (availability of inventory, budget, policy, tree planting approach, pruning, staffing and habitat suitability) were selected (Kenney et al., 2011). Three performance indicators were assigned to each criterion and normalised on a numerical scale from 0 to 2 with 0=low performance, 1=moderate performance and 2 = good performance for each criterion. The maximum sustainability score per criterion was 2 and for the total selected criteria was $2 \times 7 = 14$. The level of sustainability for each urban forest element was calculated using a linear function by applying the following formula:

Level of urban forest sustainability expressed as a percentage (%) = (total performance score − Min score)/(Maximum performance − Min)) * 100%

Results

Classification of urban forest elements

The study adopted two modes of classification based on land use and the history of urban forest establishment. The first mode of classification grouped elements based on land use types as follows:

(1) *Conservation urban forest (CUF)*: Urban forest elements used for conservation, recreation, education and ecotourism. Under this, the two elements identified were Limbe Botanical Garden (LBG) and Limbe Wildlife Centre (LWC).
(2) *Institutional Urban Forest (IUF)*: Land uses such as offices, schools and residential area dominated by trees. Two institutional urban forest elements were identified in the city, one on land occupied by the Cameroon Development Corporation (CDC) and the other on land use occupied by SONARA. The Institutional urban forest of the CDC was more persistent and covered administrative and residential areas and the reason for a more detailed description in this study.

(3) *Roadside trees (RT)*: These are naturally grown or deliberately planted trees along major roads in the city.

The second mode of urban forest classification was based on the periodisation of city political history. Three classes of urban forests emerged from contrasting tree planting approaches between different historical eras, ranging from colonial, post-independence and modern era (Table 1).

Developmental history of prominent urban forest elements

The urban forest developmental pathway is deeply entangled in the city's political history and evolved as follows:

The creation of the Limbe botanic garden 1892

The Germans annexed Cameroon in 1884 and by 1892 the Limbe Botanic Garden was created (Onana et al., 2017). It was the first botanic garden in Central and West Africa and the first urban forest element to be created in Limbe (Figure 2). After its creation the German colonial masters indulged in large-scale land grabbing to establish cash-crop commercial plantations (Njoh, 1997). The LBG acted as an agricultural research and training station for exotic and native species like pineapple, banana, tea, coconut, palm oil and rubber, which were later planted in commercial plantations in Cameroon and other colonies (Onana et al., 2017). The initial surface area occupied by the LBG was 140 ha which has reduced to its current size of 48 ha as a result of encroachment.

Table 1. Characteristics of colonial, post-independence and modern eras of urban forest.

	Historical profile		
Parameters	Colonial urban forest	Post-independence urban forest	Decentralisation era of urban forest
Period of creation	before 1961 and linked to colonialism	1961–2000	2000 to today
Elements	Limbe Botanic Garden. The Institutional urban forest of CDC land use areas (offices and residential)	Limbe Wildlife Centre Roadside trees	Densification of roadside tree planting and creation of pocket parks
Ownership	Public	Public	Public
Naturalness	Natural and planted forest	Mainly planted forest	Mainly planted forest
Location in the city	Victoria town whose name was changed to Limbe city but today known as Limbe I sub-division	Limbe I, II and III sub-divisions	Limbe I, II and III sub-divisions

Figure 2. Limbe botanic garden bridge.

British inheritance of German properties and the creation of the institutional urban forest of the CDC

The Germans introduced land use zonation which divided the city into agricultural, administrative and residential zones (Nguh, 2013). Agricultural zones were used for plantation agriculture. Whereas residential lands were stratified based on income level of plantation workers. The first section called senior service quarters (part of it now Government Residential Areas GRA) is characterised by low density/high-income settlement areas with beautiful extensive fruit and ornamental tree gardens occupied by the colonial masters (Njoh, 1994). The second land use called the camps is characterised by a dense neighbourhood with houses closely built leaving limited spaces for trees occupied by local plantation workers.

After the First World War, the British took over all German properties in Southern Cameroon such as the plantations, houses, companies and the LBG. Under British administration the LBG was managed as a replica of the Royal Botanical Garden at Kew in Britain. The British introduced many important fruit trees like mango and citrus in the LBG as well as around the neighbourhoods. By 1946, former German plantations were converted to the CDC by Ordinance No. 39 of 1946 (Njoh, 1997) and the CDC became operational in 1947. All inherited plantations and land uses were treated as CDC properties. The institutional urban forest of the CDC refers to all trees found in land uses (offices and settlement area) occupied by the CDC (Figure 3). The British managed the corporation until 1961 when Cameroon gained independence.

Figure 3. The institutional urban forest of the CDC behind the CDC head office.

The creation of the Limbe WildLife centre, 1963

After independence, all colonial urban forest elements were inherited by the federal government of Southern Cameroon. Part of the LBG was converted into the zoological garden in 1963 and both institutions were managed by a single conservator. When management of the botanic garden and the zoo became too onerous for a single conservator to handle they were separated through a presidential decree in 1993. The same decree also changed the name to the Limbe Wildlife Centre (Figure 4a). It has a surface area of 3.5 ha and is located in the Garden neighbourhood in the Limbe I subdivision (Figure 4b). It is used for wildlife rescue, rehabilitation, research and education (Wanie & Asoh, 2016).

Roadside tree planting 1970s to 2000

During the post-independence era, Limbe continued to expand in population and surface area. The government instituted the notion of rural and urban councils through the presidential decree No 74/24 of December 1974 and Limbe gained the status of urban council with Benjamin Latekwe Bodylawson as the pioneer mayor. He was disturbed whenever he saw visitors and tourists standing out in the sun in the Down Beach neighbourhood to enjoy and appreciate the sea. Being very aware of the benefits of trees impacted by the presence of the LBG, the mayor initiated the first roadside tree planting in the city and aimed to provide shade and beauty. The first species planted in the 1970s were mainly *Terminalia mantaly* obtained from the *Bimbia Bonadikombo* community forest with labour provided by the council workers. Some of the trees can still be found around the community field and Down Beach quarter (Figure 5) although the majority were vandalised.

In 1993, the Limbe urban council was assigned a special status and became a city council governed by an appointed government delegate who continues to add new roadside trees in the city, species include *Albizia lebbeck* and *Cocos nucifera*.

(a) (b)

Figure 4. Trees shading animals in the Limbe Wildlife Centre.

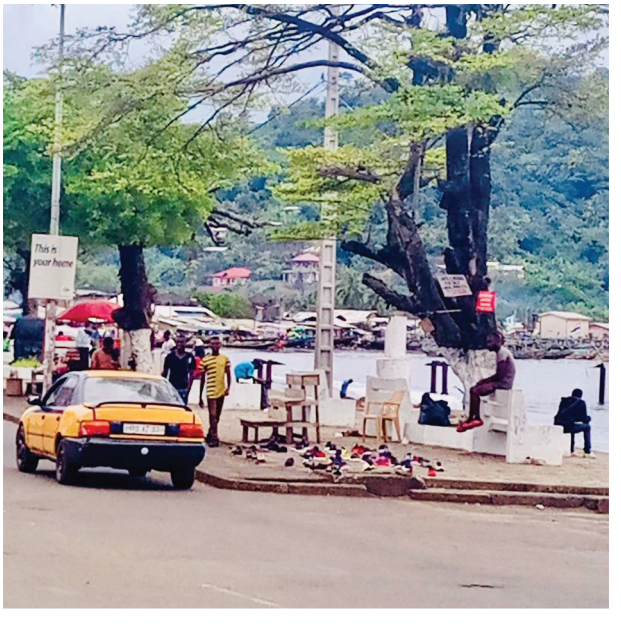

Figure 5. Relics of the first roadside trees planted in the city located at Down Beach quarter.

Intensification of roadside trees and the creation of pocket parks from the 2000s to date

In the early 2000s, the government of Cameroon devolved certain responsibilities to councils through Law No. 2004–18 of 22 July 2004. Government delegates were handed the responsibility to promote economic development, environmental management, urban development and housing, health and social development. Environmental management responsibilities were reforestation, creation and management of council

forests, parks and gardens. This law acted as a booster for the intensification of roadside trees in the city. It is believed that lines of *Albizia lebbeck* trees from Mile 4 Park to Mile 4 Police Checkpoint along the national road number 3 were planted during this period. In addition, clusters of existing roadside trees planted in the 1970s were converted to small pocket parks around the Community Field Junction and Down Beach Area by adding recreational facilities like chairs with the motive of making the city more beautiful.

In 2007, presidential decree no 115/2007 of 2007 was passed which divided the municipality into three sub-divisions, Limbe I, II and III headed by sub-divisional mayors. These newly created sub-divisions were placed under the supervision of the city council. Limbe I sub-division acquired most of the land area of colonial Limbe while Limbe II and III were peri-urban areas which gained an urban status. Tree planting intensified more in the city in the years that followed the election of sub-divisional mayors as they were enthusiastic to make their sub-division better than others.

Today, roadside trees can be found along most parts of the 68.8 km tarred road network in the city. Planting activities in the different sub-divisions is mostly supported by government subventions and external grants. Sub-divisional mayors can only plant trees but other management activities like pruning is the responsibility of the city council. Certainly, roadside tree planting has helped to give the city of Limbe a good image. The beautiful views amidst several criteria contributed to the winning of the first prize during the first round of the Cleanest City Award in 2020, an initiative of the Minister of Housing and Urban Development launched in 2019 to promote hygiene and sanitation in Cameroon cities.

Urban forest management and level of sustainability

Urban forest management objectives vary with types of urban forest elements with tree preservation promoted in most cases rather than tree planting (Table 2).

Level of sustainability of urban forest elements

The results show that the level of sustainability varies with the urban forest elements. LBG expressed the highest rate with 66.6%, while the level of sustainability for the LWC, IUF and RT was very low. Three of the six criteria present the lowest performance regarding the "availability of the tree inventory", the "availability of management plan or regulation" and "tree planting" while "Staff competencies" shows a high-rate performance especially in the LBG as illustrated in Table 3.

Discussion and conclusion

Evolving urban forest types and ownership development over time

This study used a case study approach to assess urban forest development and the current level of sustainability in the city of Limbe. Findings revealed that urban forest elements are owned by separate government institutions and span different land uses such as conservation, institutional and roadside. Tree planting has been an old practice

Table 2. Summary of current urban forest structure and management.

Element	Tree Management Objectives/Uses	Management Agency and Unit	Government Department	Abundant Tree species	Urban forest structural characteristics	Management Activities
Botanic garden	Tree preservation and tree planting Act as gene banks for afforestation activities	Forest reserves under the permanent domain of state forest (Forestry Law, 1994) Classified as technical operation unit	Ministry of Forestry and Wildlife	Medicinal plants Ornamental plants Fruit trees Non-timber forest products	Contains large number of mature trees which provide a dense forest view to people. Considered as the most prominent urban forest element in Limbe.	Spontaneous tree planting, Reactive Pruning by contractors, Absence of tree care and survival data.
Institutional urban forest of the CDC	Tree preservation/ shade, fruits and beauty.	Cameroon Development Corporation under the Department of Planning, Environment, Research and Quality	Ministry of Agriculture and Rural Development	Fruit trees and ornamentals e.g. exotic fruit trees like *Magnifera indica* from Central America and exotic ornamental species *Lantana camera* (Lantana bush) and *Plumera rubra* (Frangipani) introduced by the British are the most abundant species.	Mature trees around houses and office in the CDC land uses	Reactive pruning only
Wildlife Centre	Tree preservation/ provide shade and, food for animals in captivity	Managed as an operational unit of parks and protected areas	Ministry of Forestry and Wildlife in collaboration with an NGO called Pandrillus based in Calabar Nigeria	The majority of trees are mature and believed to have been planted during the early days of the wildlife centre. Common tree species in this urban forest include *Mangifera indica*, *Persea americana*, *Cocus nucifera*. *Moringa oleifera*.	Mature and ageing trees	Reactive pruning by botanic garden staff, Evidence of tree planting by nature clubs and NGOs. Absence of planting and survival data

(*Continued*)

Table 2. (Continued).

Element	Tree Management Objectives/Uses	Management Agency and Unit	Government Department	Abundant Tree species	Urban forest structural characteristics	Management Activities
Roadside trees	Tree preservation and planting/ shade and beauty	City council under the directorate of Urban Development and Environmental Management	Ministry of Decentralization and Local Development in collaboration with the Ministry of Forestry and Wildlife. and Ministry of Housing and Urban Development	Shade trees and ornamentals e.g. *Albizia lebbeck* *Cocus nucifera* *Polyathia longifolia*	Both mature and young trees are present Tree ages vary directly with the ages of sub-division	Reactive planting No budget was allocated for tree planting by the city council. Reactive pruning when trees fall on the road, disturb electric lines or are overgrown. Pruning done by contractors

in the city from the colonial, post-independence right to modern eras similar to other sub-Saharan African countries (Titz & Chiotha, 2019). Evidence from the study reveals a direct relationship between urban forest availability and age of sub-division with the oldest Limbe I sub-division harbouring most urban forest elements. The presence of the LBG, LWC, IUF and the oldest RT population together present an iconic forest (Cavender & Donnelly, 2019) compelling this study to consider Limbe I as the greenest sub-division in the municipality.

The result also confirms the influence of colonialism in the establishment of green infrastructure (Danilina et al., 2021; Hunte et al., 2019; Shackleton & Gwedla, 2021). The LBG and IUF represent colonial legacies which have persisted over time (Roman et al., 2018). The LBG as the oldest urban forest element played a very important role in promoting the development of other urban forest (Cavender & Donnelly, 2019) by providing seedling and technical support for afforestation activities. The exotic fruit tree *Mangifera indica* tested in the LBG by the British was the most common species observed in different types of urban forests. This result compares well with a previous study which highlights that British colonial legacy influenced urban forest tree species' composition in their territories (Hunte et al., 2019).

Table 3. Sustainability performance rate of urban forest elements.

		Urban forest elements and their sustainability score			
Criteria and management objective	Performance indicators	L B G	L W C	I U F	R T
Availability of tree inventory	(0) No inventory present (1) Sample inventory (2) Complete inventory	1	0	0	0
Availability of management plan or tree regulation	(0) Does not exist (1) Available but limited in scope (2) Available and extensive in scope	1	0	0	0
Staff competencies related to urban forest management	(0) Untrained top management and untrained field staff (1) Trained top management and untrained field staff (2) Trained top management with trained field staff	2	0	1	1
Adequate funding to optimize tree benefits	(0) No budget allocation, reliance on external aid (1) Small funds for reactive management (1) Some budget allocation	1	0	1	1
Tree planting	(0) Impromptu (1) Depends on need assessment (2) Fixed periodicity	1	0	0	1
Habitat suitability	(0) No testing (1) Species are considered in site selection (2) Presence of habitat suitability guidelines	1	1	0	1
Maintenance activities like pruning	(0) No pruning (1) Reactive pruning (2) Proactive pruning	1	2	1	1
Total Performance Score		8	3	3	4
Level of Sustainability %		66.67	21.43	21.43	28.57

0 = Low performance; 1= Moderate performance, 2 = Good performance.

Neighbourhood inequality in green space availability and distribution (Shackleton & Gwedla, 2021) observed in some African cities was also partly true for the city of Limbe. Within the land use of the CDC, the former colonial residential area had more trees than those of local plantation workers' areas known as camps. However, newly created quarters like *New Town* and *Garden* had even fewer trees than the camps which at least suggests that inequality in urban forest distribution may also result from marginalisation of tree planting in contemporary urban planning.

Governance and sustainability matter in promoting urban forest development

Though laws on councils highlight municipal authorities as principal stakeholders in promoting urban forest development in cities, these stakeholders are still not being proactive as afforestation activities have been reduced to spontaneous roadside trees planting. This results in the colonial urban forest elements remaining very prominent in the city. However, taking advantage of potential sites for tree planting like vacant land (Anderson & Minor, 2017) in the new Limbe II and III sub-divisions with less dense built infrastructures for the creation of new urban forest elements such as parks will increase urban forest availability, sustainability and the city image (Eckart, 2018).

Yet increasing urban forest benefits and sustainability (Vogt et al., 2015) largely depends on the availability of resources. According to the study, absence of budget, tree management strategy and inventory were significant issues affecting urban forest sustainability in Limbe. The LBG was the only urban forest which showed a high level of sustainability due to the fact that they are managed as a protected area by law and the government ensures species protection is guaranteed by trained staff. The very low sustainability scores for IUF and LWC could be because tree management is not part of the official mandate of these institutions. Tree pruning is the only management activity performed for sanitation. The absence of tree planting has promoted a mature and ageing tree population vulnerable to wind and storms. The lack of a tree management strategy may lead to trees disappearing in the future. Supporting stakeholders to prepare an urban forest management strategy that can serve as a tool to monitor management and attract funding is essential.

Local policy uptake for the speedy development of urban forest in Cameroon

This study has revealed the extensive challenges of urban forest management in Limbe, ranging from the absence of a tree planting budget, policy, staff and an inventory which may also be the case in other Cameroon cities. The refusal of urban forest managers to allocate a specific budget to urban forest management stresses the lack of political will of municipal authorities to invest in urban forestry (Gulati & Scholtz, 2020) likely due to limited knowledge of the other benefits of trees beyond beauty and shade. As municipal authorities continue to battle with deadly floods and landslides in Limbe, increasing awareness of the effectiveness of urban forest nature-based solutions in building city resilience can help improve urban forest management and boost investment in the creation of new urban forest elements such as multipurpose parks and rain gardens on hill slopes and flood plains.

Information on non-technical aspects of urban forest management from this study provides a deeper understanding of the influence of human decision-making on urban

forest sustainability as a prerequisite for strategic planning. However, the effect of human decision-making on technical dimensions like vegetative cover and sociocultural aspects of urban forest sustainability could be considered for future study to provide a full picture of the status of the urban forest to enable the designing of a more informed, effective and inclusive strategy.

Interestingly, for a Germano-British colonial administrative city, colonial urban forests are more prominent than modern urban forests. Further research can help to unravel if a similar trend has occurred in other colonial administrative centres in Cameroon and beyond.

Acknowledgments

The authors wish to thank the staff of Limbe City Council and the Director of the Limbe Botanic Garden for their support in the field.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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