

# Peri-urban dynamics: The case of Yaounde town and its environs

Aloysious Kohtem Lebga, Nyonkwe Ngo Ndjem Marie Louise Simone, Aristide Yemmafouo

**Abstract**— This paper presents findings on peri-urban dynamics in Yaounde town and its environ. The objective of this research is to show how uncontrolled or galloping urbanisation without corresponding infrastructures determines peri-urban dynamics in Yaounde town and its environ. To attain this, a multi-criteria image processing through satellite image remote sensing and Geographic Information System was applied to analyse urban evolution. A stratified and simple random sampling technique was used to administer 624 questionnaires alongside interview granted to major stakeholders within the peri-urban zone. Findings show that Yaounde is highly dominated by horizontal urbanisation which has passed from 40074.79 in 2016 to 43774.21 hectares in 2018 into peripheral zones, more than 32% of peri-urban dwellers used cargo bus as a major mode of transportation within the peri-urban area, the prices of land in the Yaounde peri-urban areas range from 15 000 to 200 000 FCFA per m2 and about 32% of total public services in the peri-urban zone is located in the Centre Business District.

**Key words** — Peri-urban dynamics, urbanisation, peripheral zones, urban infrastructure, Yaounde

## 1 INTRODUCTION

Peri-urban area is a transitional or interaction zone surrounding built-up area that constitutes an "uneasy" phenomenon characterised by either the loss of rural aspects or lack of urban attributes which is subject to rapid transformation (Samat et al, 2011 and Allen, 2003).

Urbanisation remains an inevitable phenomenon in Africa South of the Sahara that has a distinctive characteristic of chopping into urban fringes. Urbanisation is a global phenomenon which is currently sweeping through developing countries like wildfire (Akunnaya et al, 2014). Cameroon is experiencing rapid and unplanned urbanisation (Papito, 2017). According to the 2010 population projection, Yaounde is home to about 1.7 to 2.2 million inhabitants (UNO Habitat, 2007). The uneven distribution of urban infrastructures and utilities enhanced peri-urban dynamics. Here its shortages, abundance, and rationing of basic goods and services in most urban areas have obliged dwellers to move to urban fringes with enough space to establish individual infrastructures like boreholes, solar panel to counteract power and water shortages. Privatisation of the water sector has not improved the water problems of peri-urban inhabitants thus inhabitants are still facing water shortages, rationing, poor coverage and high pricing (Lotsmart et al, 2017). Rising land prices remain a major cause for urban expansion from Yaounde town toward the periphery that welcomes a majority of low income earners and few high class citizens in search of bigger surface area for construction.

Recently, Yaounde town has been characterised by rising land

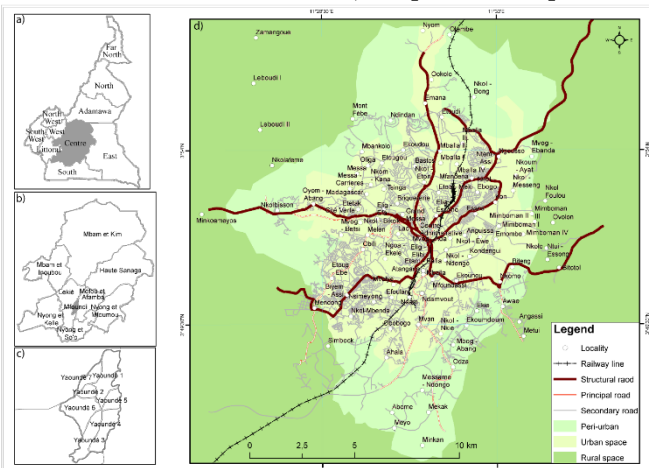
prices and the presence of third parties makes land transaction complex and problematic thus poor dwellers are priced out of even the less desirable areas into temporary settlement (Cobbinah et al, 2017). The state is the only trustee of all land within the national territory and has absolute authority over its allocation but further stresses that formal and informal land transactions exist in peri-urban areas with formalised land titling and registration dominating in urban centres, and reduces as one moves towards the periphery (Bah et al, 2003). Urban areas produce more than 70% of wastes that return to nature in the form of pollution (Lotsmart et al 2017 therein Allen and You et al, 2003). African peri-urban areas are places of possible disaster outbreaks in terms of disease due to their general lack of planning and institutional integration ( Chirisa, 2010). Being aware of the challenge of urban and regional development, the government has pointed in her long-term vision, to control urban development and make urban centres production and consumption hubs to boost the industrial sector, promote the emergence of suburban towns, development of medium-sized or second class towns that will boost economic activities in urban areas as well as contribute to the development of neighbouring rural areas (Growth and Employment strategy paper, 2009).

## 2 LOCATION OF STUDY AREA

Yaounde is the political capital of Cameroon. The peri-urban area of Yaounde is located between longitudes 11.412 and 11.576 East of the Greenwich meridian and latitude 3.715 and 3.963 North of the equator. Administratively, it is the head quarter of the centre region and Mfoundi division. It's made up of seven sub-divisions; Yaounde 1, 2, 3, 4, 5, 6 and 7. Even

- Aloysious Kohtem Lebga, Researcher in the National Institute of Cartography, Yaounde Cameroon. E-mail: lebga1989@gmail.com
- Nyonkwe Ngo Ndjem Marie Louise Simone, Researcher NIC, Researcher in the National Institute of Cartography, Yaounde Cameroon. E-mail: nmarielouise@gmail.com
- Aristide Yemmafouo, Associate Professor, University of Dschang, Cameroon. E-mail: ayemmafouo@yahoo.fr

though it is very difficult to define or delimit a clear-cut boundary between urban and peripheral zone in Africa and Cameroon in particular, the case in question shows little distinctive transitional characteristics as one moves from the Centre Business District (CBD) to the periphery. Today, the peri-urban area of Yaounde covers a surface area of about 8 655 hectares with closed to 40% of it being urbanised. The Figure 1 presents the study area; a) the Centre region in Cameroon, b) the Mfoundi division in the centre region, c) the various Sub-divisions in the Mfoundi division, d) the peri-urban space.



Source: Extract from the administrative map of Cameroon by NIC (2007), urban diagnostic transportation plan of Yaounde (2010) and google earth satellite image (2017)  
Fig. 1. Location of Yaounde peri-urban space

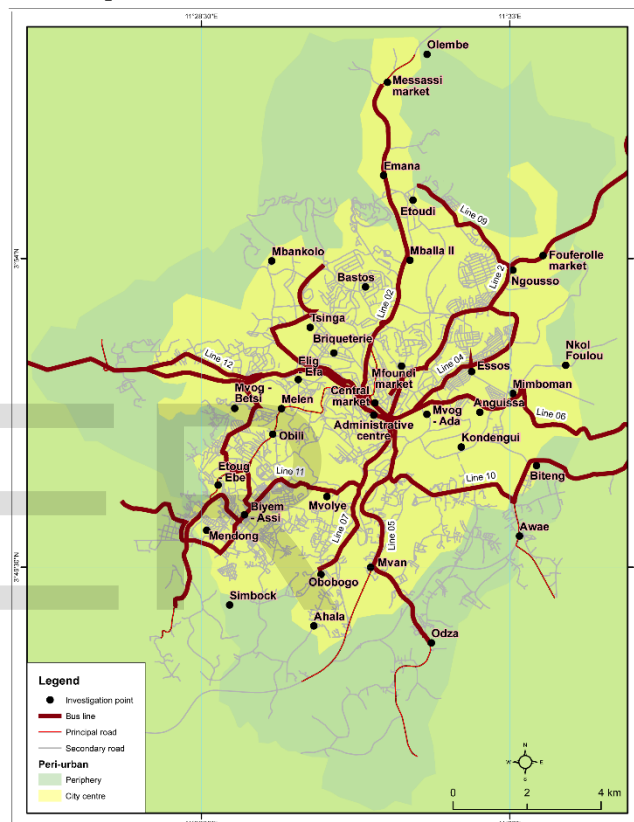
### 3 FIELDWORK AND DATA COLLECTION APPROACH

This work which covers the seven sub-divisions of Cameroon’s political capital and its environs makes use of both primary and secondary data. Questionnaires and interview guides were used to collect data directly from the population and indirectly from major stakeholders in the peri-urban space. A stratified and simple random sampling technique was used with special focus on moto parks, markets, junctions and other meeting points to get first-hand information on peri-urban dynamism. Questionnaires were stationed and administered in all the seven sub-divisions that made Yaounde and its environs, and the respondents were mainly peri-urban inhabitants. Interview guides were equally administered to major stakeholders like municipal and administrative authorities (Sub-divisional, Divisional, Regional and Centre), trade union representatives, foodstuff retailer (Buyem sallem) and others.

Table 1. Stakeholder in Yaounde peri-urban

Stakeholders	Number
Municipal authorities	5
Sub-divisional	4
Divisional	2
Centre	5
Trade union representatives	6
Buyem Sallem	10
<b>Total</b>	<b>32</b>

Primary data collection made use of questionnaires and interview guides in major strategic points within the peri-urban area of Yaounde town like markets ( Mfoundi, Mokolo, Mvog-Ada, Mvog-Betsi, Elig-Edzoa, Ngouso, Madadascar, Fouferolle, Odza, Simbock, Etoudi, Messassi, Essos and Yaounde central market), major junctions ( Nkolfoulou, Nkolbisson, Mvan, Biyem-assi, Oyomabang, Etoudi, Eman, Mendong, Ahala, Ekounou and Biteng just to name a few which major centres of attractions. Figure 2 shows a spatial distribution of investigation points (14 markets and 21 major points of attractions) within the Yaounde peri-urban area.



Source: Field work September 2018

Fig. 2. Major points of peri-urban investigation in Yaounde

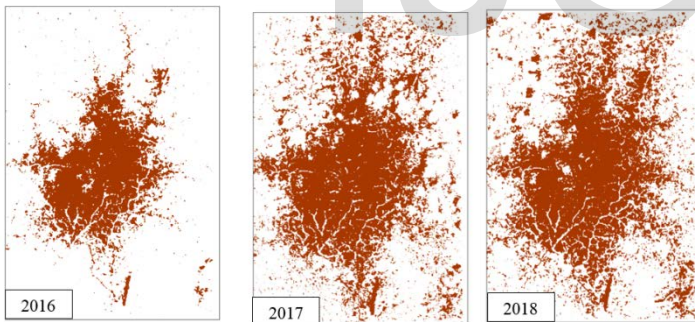
Secondary data collection involved the consultation of journal, thesis, libraries, official reports, documents on urban and council planning, sectorial planning to get a tip of that which had been said or done on Yaounde and its environs.

The main focus of discussion was based on peri-urban dynamism conditioned by uncontrolled urbanisation, sky rocking prices of urban land, state of peri-urban infrastructure and utilities, and others which influenced urban-peripheral interaction within Yaounde and its environ. Both qualitative and quantitative analyses were used in order to facilitate comprehension as well as maps to represent analysed spatial facts that influence peri-urban dynamism in Yaounde.

## 4 RESULTS AND DISCUSSION

### 4.1 Peri-urban evolution in Yaounde from 2016-2018

Uncontrolled occupation and rising prices of urban land in the city centre have been the major causes of mass movement and settlement of Yaounde city dwellers in urban fringes even though these areas have insufficient basic infrastructures and utilities to support this growing population. The peri-urban area of Yaounde has undergone a series of expansion due to population growth and the presence of infrastructural facilities that linked Yaounde and its environs thereby influencing peri-urban dynamism in term of territorial planning (rationing, conserving, regulating risky zones and conflict management just to name a few). Yaounde, just like other tropical cities is highly dominated by horizontal urbanisation into the peripheral zone, this has passed from 40074.79 in 2016 to 43774.21 hectares in 2018. This phenomenon comes as a result of uncontrolled urban land utilisations which has several social and environmental consequences as confirmed by Tchotsoua, 1995 that; this high rate of urbanisation is neither regulated or controlled because its generally spontaneous that cause erosion within the urban perimeter and cultivated area within the Yaounde town. Urban area expansion encroaches into agricultural areas especially at the peri-urban region (Samat, 2011). This lead to the transformation of the peri-urban landscape from it natural to artificial stage; (reduction of agricultural land, environmental loss, changing behaviour of citizens). Figure 3 shows the spatial evolution of the peri-urban area of Yaounde from 2016-2018 with a considerable increase of about 1233.14 hectare in less than half a decade.



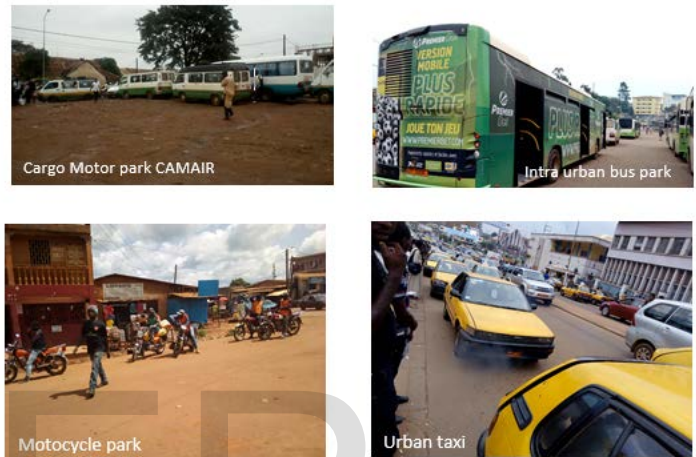
Source: Sentinel satellite images 2016-2018

Fig. 3. Yaounde spatial peri-urban evolution from 2016-2018

### 4.2 The dynamism of peri-urban transport in Yaounde

Peri-urban mobility has become the most visible and disordered sector within Yaounde town due to lack of planning and high rate of population growth that does not match with the available transport infrastructures and facilities in place, thus illegal parks are seen almost everywhere in town with disastrous effects which falls in line with the work of González, 2017. The dynamism of the peri-urban transport system in Yaounde can be understood through the major mode of transportation like motorcycle, taxi, regular and mini bus (cargo bus), and clandestine taxi. Regular and cargo buses

are the major modes of transportation which influences peri-urban dynamism that mainly flight on structural road that leaves from the CBD through the periphery to the rural area. The outcomes of about 624 questionnaires administered in major departures, arrivals, markets and others public areas within Yaounde peri-urban shows that; more than 32% of peri-urban inhabitants used cargo bus as a major mode of transportation from the periphery into the CBD, 25.64% used auto bus a well organised transport system, 22.44 used motorcycle which remained the most risky and speedy mode of transportation, 15.87 depends on urban taxi and the 4.01% on clandestine taxi as shown in figure 3.



Source: Field work September 2018

Fig. 4. Diverse modes of peri-urban transport in Yaounde

The dynamics and diversified nature of the Yaounde peri-urban transport network has brought about inhabitant's or user's preference in choosing among the various modes of transport. This is generally based on security, speediness and comfort just to name a few as shown in table 2.

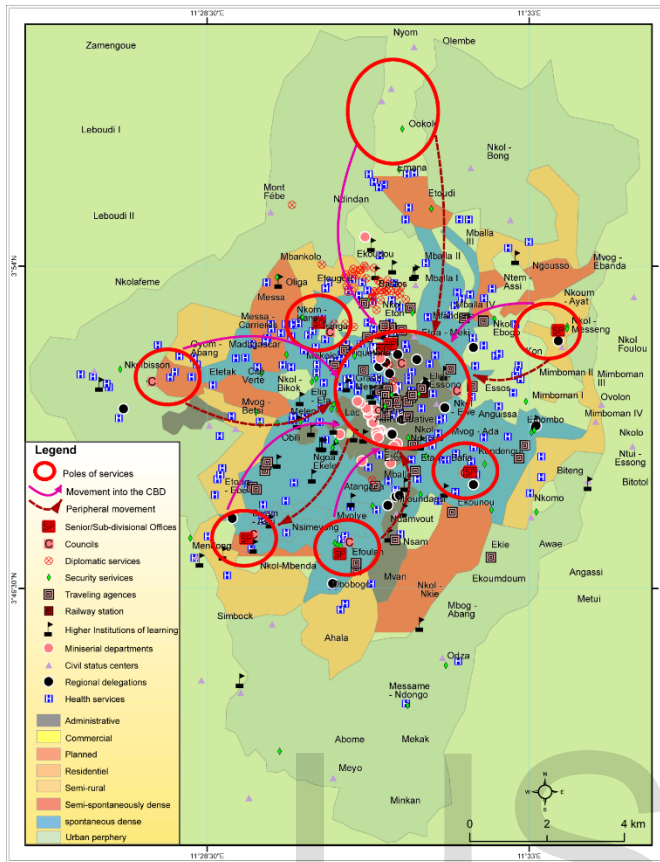
Table 2. Modes of peri-urban transport system and inhabitant's preference

Mode of transport	Number of person per transport mode	% of persons per transport mode
Motorcycle	140	22.44
Taxi	99	15.87
Regular bus	160	25.64
Mini bus (cargo)	200	32.05
Clandestine taxi	25	4.01
<b>Total</b>	<b>624</b>	<b>100</b>

Source: Field work August 2018

The fact that regular and cargo buses link the Yaounde CBD and its periphery is due to its vast network of about 20 loading points, tarred road, cheaper rate (200-250 FCA), speedy and its collective nature (10-30 passengers). Figure 5 shows the determinant role played by major roads which trespass the peri-urban milieu that favour the movement of Yaounde peri-urban dwellers thus enhancing urban dynamism.





Source: Field work September 2018 and urban diagnostic transportation plan of Yaounde (2010)

Fig. 7. Public services and urban displacement within Yaounde Peri-urban

## CONCLUSION

Yaounde, being the centre of power and decision making of the country, is a convergent point of both active and retired civil servants, business magnets, and people from about 200 ethnic groups that make up the country many refer to as "African in miniature". This paper has demonstrated how peri-urban dynamics in Yaounde town and its environs influences territorial construction, creating urban infrastructures and facilities which serve as a means of peri-urban interaction. This urban explosion through horizontal expansion coupled with galloping prices of urban land makes urban peripheral zones in Yaounde town the only option for city dwellers that have started experiencing the spill over effects of urbanisation (Abalaka, 2018). This continuous loss of land in the urban fringe of Yaounde for settlement and other installations does not match with the requirement ancillary infrastructure and social services which fall in line with the work of Cobbinah et al, 2014 in Kumasi. The creation of sub-divisions and councils alongside some basic public services as well as a good transport system has transformed the entire peri-urban landscape of Yaounde, this confirms what Kombe, 2003 examines recent trend in land use transformation in the peri-urban areas of Dar es Salaam.

## ACKNOWLEDGMENT

The authors wish to thank Mr. Jumcoda Rifor, a senior land surveyor in the Ministry of State Property, Surveys and Land Tenure for assisting them on the field, Madam Ndengwe Laura and some senior researchers in the National Institute of Cartography for correcting the first draft.

## REFERENCES

- [1] Allen, E. (2003). Environmental planning and management of the peri-urban interface: perspectives on an emerging field. SAGE publication, 15(1), 135-148. Retrieved 6 21, 2018, from <http://eau.sagepub.com/content/15/1/135>
- [2] Bah, M., Salmana, C., Bitrina, D., Gouro, D., Fred, L., Okali, D., ... Tacoli, C. (2003). Changing rural-urban linkages in Mali, Nigeria and Tanzania. *Environment & Urbanization*, 15(1). Retrieved 7 15, 2018, from [https://www.ucl.ac.uk/dpu-projects/drivers\\_urb\\_change/urb\\_economy/pdf\\_Urban\\_Rural/IIED\\_Bah\\_Mali.pdf](https://www.ucl.ac.uk/dpu-projects/drivers_urb_change/urb_economy/pdf_Urban_Rural/IIED_Bah_Mali.pdf)
- [3] Chirisa, I. (2010). Peri-urban dynamics and regional planning in Africa: Implications for building healthy cities. *Journal of African Studies and Development*, Vol. 2(2), pp.15-26. Retrieved July 26, 2018, from <http://www.academicjournals.org/JASD>
- [4] Abalaka, L. D. (2018). An Assessment of the Benefits and Externalities of Urbanisation in Kogi East, Nigeria. *Journal of Environment and Ecology*, 9(1), 14. doi:doi:10.5296/jee.v9i1.13301
- [5] Akunnaya, P. O., & Adedapo, O. (2014). Trends in Urbanisation: Implication for Planning and Low-Income Housing Delivery in Lagos, Nigeria. *Scientific & Academic Publishing*, 4(1A), 15-26. doi:DOI: 10.5923/s.arch.201401.03
- [6] Cameroon. (2009). Growth and Employment strategy paper. Yaounde. Retrieved 20 22, 208, from <http://thereddsk.org/printpdf/countries/policies/growth-and-employment-strategy-paper>
- [7] Cobbinah, P. B., & Amoako, C. (2014). Urban Sprawl and the Loss of Peri-Urban Land in Kumasi, Ghana. *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering*, 8(1). Retrieved 11 5, 2018, from [scholar.waset.org/1999.10/9997496](http://scholar.waset.org/1999.10/9997496)
- [8] González, G. M. (2017). Planning, urban sprawl and spatial thinking. *European Journal of Geography*, 8(1), 32-43. Consulté le 10 5, 2018, sur <http://www.eurogeographyjournal.eu/articles/2.Planning%20Urban%20Sprawl%20and%20Spatial%20Thinking.pdf>
- [9] Lotsmart, F., & Violet, F. (2017). Water Crisis and Options for Effective Water Provision in Urban and Peri-Urban Areas in Cameroon. *Society & Natural Resources*, 20. doi:DOI: 10.1080/08941920.2016.1273414
- [10] Papito, U. E. (2017). Urban and peri-urban agriculture in Cameroon: Status and perspectives for development. *International Journal of Agronomy and Agricultural Research*, the International Network for Natural Sciences, 11(3), 116-127. Retrieved 10 22, 2018, from <https://hal.archives-ouvertes.fr/hal-01651904>
- [11] Samat, N., Hasni, R., & Eltayeb Elhadary, Y. (2011). Modelling Land Use Changes at the Peri-Urban Areas using Geographic Information Systems and Cellular Automata Model. *Journal of Sustainable Development*, 4(6). doi:doi:10.5539/jsd.v4n6p72
- [12] Tchotsoua, M. (1995). Urbanisation et Erosion accelereee dans la ville de Yaoundé: Comment ameliorer la conservation de l'environnement urbain en milieu tropical humide.
- [13] UNO HABITAT. (2007). Profil urbain de Yaoundé. Nairobi: Publié par le

Programme des Nations unies pour les Établissements Humains. Retrieved 10 9, 2018, from <http://www.unhabitat.org>

- [14] Wilbard , J. K. (2005). Land use dynamics in peri-urban areas and their implications on the urban growth and form: the case of Dar es Salaam, Tanzania. *Habitat International*, 29, 113-135. doi:doi:10.1016/S0197-3975(03)00076-6
- [15] Yaounde City Council. (2010). Urban diagnostic movement plan of Yaounde.

IJSER