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Full Length Research Paper

The paradox of post-colonial urban growth in the city of Zaria, Nigeria

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Post-colonial urban growth and expansion is spiralling in Nigerian cities, marked by a curious lack of planning in the newly developed areas despite an initial impetus during the colonial administration for some measure of formal regulation. This paper attempts to examine the character of the phenomenon and its contrasts with the foundation laid for modern formal town planning during the colonial era in Nigeria. It examines these trends using the city of Zaria in Northern Nigeria. This shows the transition in the development of the form and structure of the city from pre-colonial period to the present and how weak public institutional structures as well as policies have led to the creation of an uncontrolled environment, which leaves most new developments in the city unplanned. A review of this case study reveals that Zaria, a large and historic city with pre-colonial roots, was established as one of the medieval Hausa Cities. Its structure includes a tripartite form, representing elements from pre-colonial, colonial and post-colonial town planning precepts. The ancient city reflects a traditional settlement setting based on traditional principles of organisation in walled cities. The colonial settlement areas are represented by the European Reservation Area, established to accommodate staff of the British colonial administration at the beginning of the last century and the native areas to accommodate native African settlers. Each of these colonial components had been formally planned using modern town planning principles though of a different genre in each case. What followed those colonial developments after independence in 1960 is an array of uncontrolled outgrowth in the periphery of each of these units that has become the albatross for planned development in the city. The paper reveals weak institutional controls in land administration and the resultant informal access to land and its development as the main factors leading to the observed trends and argues that it represents a paradoxical situation that betrays the foundations laid earlier for modern town planning.

Key words: Town planning, Nigeria, colonial, Hausa cities.

INTRODUCTION

The colonial period in Nigeria (1897-1960), has remained as a landmark era of town planning in the country. There was a transition from traditional informal town planning during the pre-colonial era to the establishment of colonial townships and eventually to the present

unrestrained growth especially in the periphery of most cities in the country. This paper traces the backdrop to these developments using the case study of the pre-colonial city of Zaria, which is one of the major theatres where these developments are featured to illustrate a

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a phenomenon of retrogression that does not appear to receive adequate attention in the efforts to address physical planning and development control in this context. It attempts in the process to set out a paradigm that conceptually encapsulates the major challenges of physical planning and development control in Nigeria.

The British colonial administration espoused a planning policy, which made a profound impact on the urban development process and its manifestation over space. Promulgated in the 1917 Township Ordinance, the policy classified all urban areas into different grades of "townships" and adopted a land use and development policy that defines the development of each category according to standards and ethos that set out separate areas for residential location for different categories of the population (Urquhart, 1976; Nigerian Institute of Town Planners, 2012).

Thus, all major settlements during the colonial era had physical development plans covering their entire area or substantial parts of it. This was the period when the European Reserved Areas (later, Government Reserved Areas - GRAs), the New African Townships (Sabongari) and a number of town planning and development initiatives were undertaken and bequeathed to succeeding administrations after independence in 1960. Prior to this period, settlement growth was guided by traditional norms of spatial organisation reflecting the culture of the local population. The aim of the paper is to review and explain the trends over this period in the pattern of physical developments in the city. It is shown that the pattern surreptitiously depicts a reversed transition from formal town planning espoused during the colonial period, to uncontrolled sprawl in the post-colonial period. It is posited that this represents a paradox and mirrors what is happening in most cities in Nigeria.

METHODOLOGY

The study is based on information from literary sources on the phenomenon of colonial town planning policies as they affected cities in Nigeria and other British colonies as well as field observations in the city of Zaria as a case study. A brief profile of the city was presented as background to the review of its geographic composition. This was supplemented by field observations consisting of general reconnaissance of the city and visits to each of the main units that represent the conceptual tripartite epochs of town planning (or lack of it) from the pre-colonial to the post-colonial periods. This was conducted in December 2017.

RESULTS

Profile of the city

Zaria, located in Kaduna State in the northern part of Nigeria (11° N; 13°E) is among the major urban centres in the country (Figure 1). It has an estimated population

of 850, 000 based on the projections of the last national census in 2006 which estimated a growth rate of about 6% per annum. Several educational institutions as well as military and commercial establishments are also located in the city. It serves as the most significant educational centre in the northern part of the country. The city covers an area of about 300 km² and is administered through two local government authorities, Zaria (Old) City and Sabongari, roughly covering the old pre-colonial and the post-colonial sections respectively. The city in general has acquired a cosmopolitan character with inhabitants from a cross section of all ethnic groups in the country. However, the Hausa-Fulani ethnic group, who are predominantly Muslim, are dominant especially in the old city.

History

The old city, with a characteristic medieval wall around it, is among the ancient settlements of the Hausa people founded since the pre-colonial period. Until the advent of colonial rule (1903), the city had existed as the seat of administration and centre of learning, commerce and religion of the Zazzau Kingdom - one of the initial seven Hausa states in the Northern part of present day Nigeria. Colonialism and the associated policy of separating native from non-native populations brought about the emergence of settlements outside the walled city. Thus, the composition of the urban area can be described with respect to its main historical core units, which include the residential areas of the pre-colonial walled city and three colonial townships. Within these, and around their periphery, several public institutions and commercial areas have been established mainly during the colonial period. Extensions, both and spontaneous have also proceeded around their peripheries during the post-colonial period to accommodate the growth of the urban area (Figure 1).

In the ranks of colonial forts, Zaria served as a provincial headquarter of the Zaria Province, a position that bestowed upon it a second-class township status under the 1917 Township Ordinance. It is at the centre of a major agricultural region linked by rail right from the beginning of the colonial era to a network of railway service in the country. It was also a major garrison town of the British, through the West African Frontier Force (WAFF), for which it hosted an army training school that exists to date as one of the major military institutions in the country. The combination of its history as the seat of the Zazzau Kingdom prior to colonisation and its colonial status as a major administrative, military and commercial centre bestowed the city with a dual identity, reflecting both pre-colonial and colonial embodiments, in the same genre as the classical dual city settlements. Similar duality in identity has been reported in much of British colonial outposts around the world (King, 1976; Urquhart, 1976).



Figure 1. Zaria in Nigeria context.
Source: Google Maps, 2015.

Colonial Town Planning

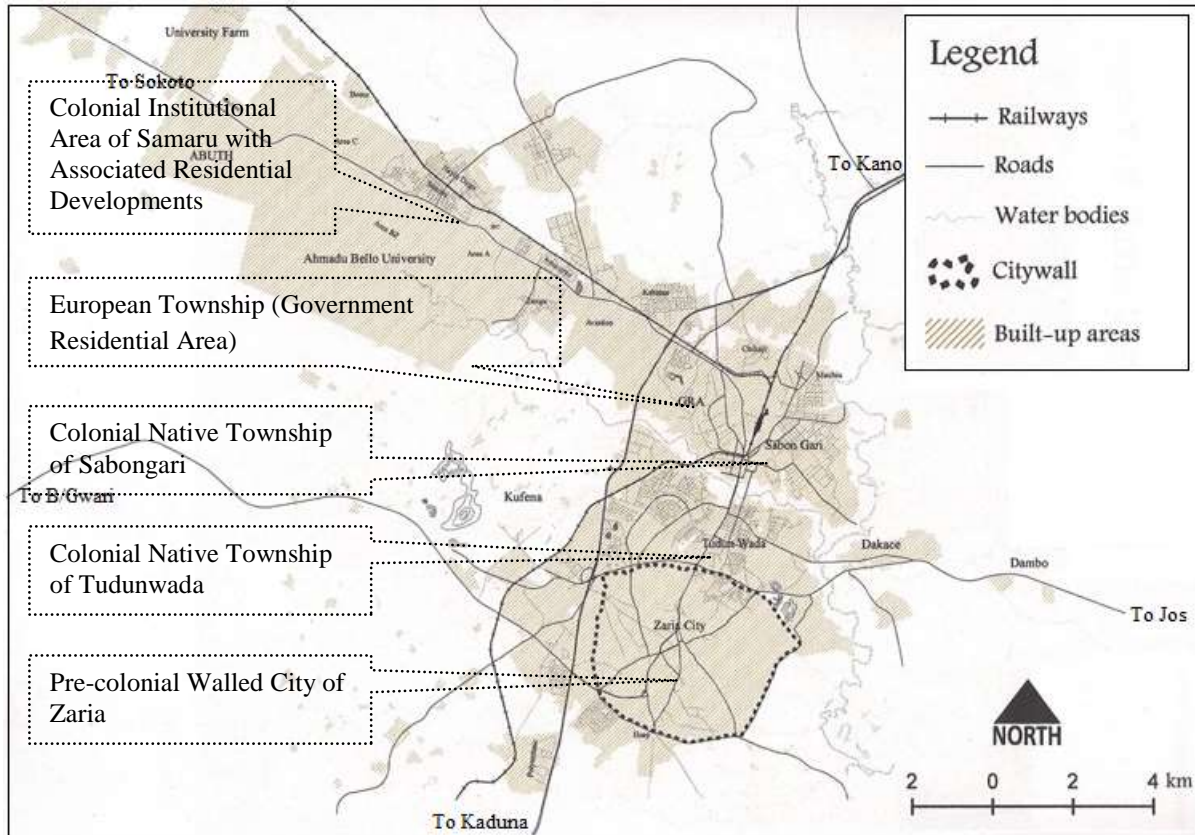
In Zaria, the colonial township development policy was implemented through the creation of three categories of new townships based on an elaborate plan that reflects the footprints of the township ordinance, generally applied to all colonial cities in Nigeria. The ordinance sought to configure the major administrative and commercial headquarters in cities throughout the country in a defined physical form that facilitates their functions. This was based on a common concept separation of residential areas and a general specialisation of land uses. This concept became the blueprint on which new settlements were established and existing ones, like Zaria, adapted to.

Prior to the ordinance, other legislations had paved the way for what eventually became a general blueprint for town planning across the country. In particular, the Cantonment Proclamation of 1904 (at the early stages of colonial rule) had been credited with setting the stage for further legislations including the 1917 Township Ordinance in that direction (Aluko, 2011; NITP, 2012). The 1904 Proclamation provided for the separation of the living quarters of the European (Colonial) population from the native population. This separation crystallised into the creation of European Residential Areas (Described later as Government Residential Area - GRA) separated usually by a track of open space from the native areas. In

between were located institutional and commercial areas, which generally became the hubs of the settlements.

The 1917 Ordinance became the main tool for implementing this concept and it added to it provisions for the accommodation of different categories of the native population itself as in the case of Zaria, along ethnic lines. It turned out to be the main pivot for the implementation of colonial town planning policies that has to date made the most profound impression on the layout and structure of most cities in Nigeria especially in the realm of modern town planning. Land use specialisation was reflected in the demarcation of institutional areas, modern commercial areas, open spaces and residential areas for different categories of indigenous and European populations (Urquhart, 1976; Ambe, 2007). The blueprint that emerged crystallised into four units in Zaria, consisting of the European Residential Area and surrounding open space buffer, public institutional areas, modern commercial and light industrial area and the three native townships of Sabon Gari, Tudunwada and Samaru (Figures 2 and 3).

These components reflect the basic features of all colonial townships across the country and among all the categories of classes, with variations only in detail and scale from town to town. However, in the pre-colonial cities of Northern Nigeria like Zaria, Kano and Katsina, there were the old city sections, with walls, existing largely uninterrupted in their physical form. This category



Colonial Town Planning

Figure 2. Structure of the Zaria Urban area showing core residential units (Author, 2018).

of cities became conglomerations consisting of three main units - the Old city with characteristic wall; the European settlement (GRA) which also includes government offices and trading plots; the African non-Northerner settlements of Sabon Gari; and the non-native Northerners settlement of Tudun Wada. Each was being treated as a separate unit in both the administrative and the town planning sense (Rollison, 1958; Urquhart, 1976).

The 1917 schema was crystallized in Zaria through a series of plans proposed by the colonial administration first in 1914 and revised in 1918 and 1939 addressing the main European Residential Area (ERA) and associated land uses. Shown in Figure 3, this was the basic prototype plan encapsulating key provisions of the Township ordinance. It includes provisions for very large (an acre or more) plots of residential land in the European section around the centre, a railway line and station linking Zaria with the cities of Kano in the North and Kaduna in the south, subsequently to the port city of Lagos and a large open space serving as race course for horses and other sports. The plan also included some public institutions (court, police station), trading areas and an expansive building-free zone providing a buffer

between this area and the native area of Sabon Gari, which was included in this initial plan. Other native areas of Tudun Wada and Samaru were to arise later.

Post-colonial urban development and comparisons

What has ensued from 1903 to the present in terms of the configuration of the city is a labyrinth of planned and unplanned growth, with the latter accounting for most of the expansion into peripheral areas through sprawl. This has given the city a mixed form and composition reminiscent of the historical epochs in the development of each of its component units both physically and socially. What is significant about the contemporary growth is not just its scale but also the lack of planning or order that characterize it. The peripheral areas where it takes place generally seem to be developing well ahead of any formal planning intervention, and much of it occurs in contravention of the planning regulations and without basic infrastructure such as access roads and services like water supply, drainage and electricity mains. The process by which this development occurs is often in complete negation of planning and local administrative

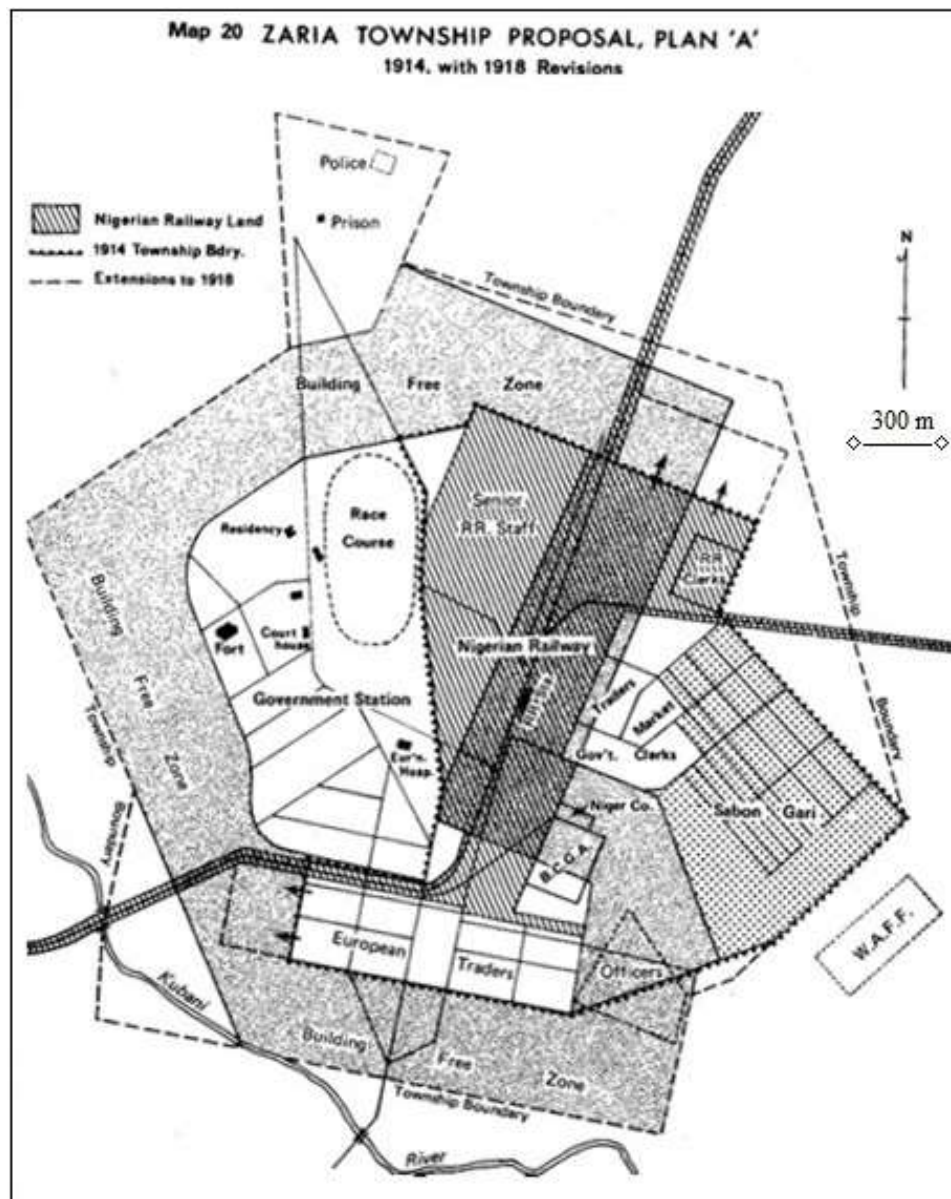


Figure 3. Plan for Colonial Townships of Zaria, 1918, showing the ERA, Railway Station and the Native Township of Sabongari (After Urquhart, 1976).

regulations and the result is the emergence of haphazard physical developments and slum-like living conditions.

An impression of the magnitude of this situation can be had when we examine the proportion of land in the urban area and spontaneous development over the course of the colonial and post-colonial period, which stands at about 70% of the present built-up area (Kugu, 2016). The growth pattern indicates characteristics depicting a clear difference between what was obtained during the colonial and post-colonial periods. Thus, while only the walled city section contained what may be described as spontaneous growth during the colonial period, a greater

proportion of the urban developments are now in that category. No clear information is available on the population of these residential areas. However, it is evident from the density of buildings observable that the planned areas accommodate only a small proportion of the about one million inhabitants of the city. The GRA in particular has a tiny part of this, quite disproportionate to the land area it occupies, meaning that the bulk of the population resides in areas that are unplanned, inclusive of the old city and all the newly emerging areas on the periphery.

Most of the new developments in terms of both the

population and expansion of built-up area occurred in the last few decades. Also in addition, much of the physical growth is at variance with the provisions of the official master plan for the city. Indeed, the reality is that the plans for all practical purposes have scarcely been implemented at all, and the result of this is the uncontrolled and unplanned pattern of urban expansion being experienced today.

In contrast to the post-colonial developments, all settlements established during the colonial era had physical development plans covering their entire area or substantial parts of it. It is curious that this town planning legacy has not been maintained, and uncontrolled development represents the main process by which the city continues to grow. Under these circumstances, developments creep out into the periphery uncontrollably, setting in place a process that seems to be self-perpetuating. The result is what we observe presently – a paradoxical situation of the older parts of the cities being better planned than the newer parts (Figure 4).

DISCUSSIONS - EXPLAINING THE CHARACTER OF POST-COLONIAL URBAN GROWTH

The phenomenon of uncontrolled sprawl is itself not unique to Zaria or to Nigeria with startling examples given in several instances between both African Francophone and Anglophone post-colonial urban areas (Bastie and Dezert, 1991), although it appears to be less severe in the latter. This seems to be a symptom of the process of informal land development that characterises these cities. This is a negation of the antecedents of modern town planning bequeathed by the British colonial administration when one considers the circumstances under which the phenomenon of uncontrolled growth has taken place.

The concern for the emergence of uncontrolled urban expansion and its persistence as the main process of growth had been a topical issue of discourse among planners and the public at large for quite a while. Several discussion sessions of the type at various occasions have provided avenues for the expression of opinions and concern over the matter, to the extent that there is hardly any problem on the issue that has not been highlighted. We can surmise that the problem of uncontrolled urban expansion and the character of it has assumed is rooted essentially to two major factors – the character of land tenure and the process of land development in the context of weak institutional controls. This is made up of a variety of problems concerning the processes of land acquisition and planning administration and physical planning – the combination of which has been described as “spatial governance” (Ravetz et al., 2013). The effectiveness of this factor has seemingly been the most potent explanation of the results observed. Thus, weak spatial governance is associated with rapid

and spontaneous high-density growth, while strong spatial governance leads to planned growth. These issues are pursued further.

Character of land tenure

The 1978 Land Use Act of Nigeria places all land in the territory of each State in the control of the Governor of the State. The Governor holds such land in trust and administers it for use and common benefit of all Nigerians (Federal Government of Nigeria, 1978). The Act stipulates that the governor shall only give statutory occupancy rights for land in both urban and rural areas, while the respective Local Governments under customary rights of occupancy may give such rights in rural areas. Therefore, the governor is empowered to grant Statutory Right of Occupancy in respect of land located both in urban as well as rural areas, while Local Governments are limited only to rural areas and in connection only with non-statutory (customary titles) which have a lesser tenure status of 30 years, while the statutory titles grant 99 years.

All landowners may apply and obtain a statutory Certificate of Occupancy, which grants title to the land for 99 years, subject to renewal afterwards. The process may involve applications for the allocation of land under a government scheme or the change of customary title to statutory title. In practice, only a very small proportion of land holding is acquired through the statutory system as stipulated in the Land use Act. For a variety of bureaucratic and technical problems, customary (informal) land ownership, also recognized by the law, remains the main mode of access to land. The implication of this is that much of the land holding is not subject to full documentation and subsequently to statutory controls in the process of development as is the case with formally acquired titles under planned schemes.

Process of land development in the context of weak institutional controls

Three main public institutions are involved in the land and planning administration systems in Zaria as in all other urban areas in Nigeria. These include the Local Planning Authority, represented in Zaria by the Kaduna State Urban Planning and Development Authority (KASUPDA), the Local Governments (Zaria City and Sabongari) and the Ministry of Lands and Surveys. Of these, the Planning Authority is the institution directly responsible for the planning and control of urban land uses.

The Planning Authority was established since the creation of the state as a successor to the defunct Kaduna State Urban Planning and Development Authority in the old Kaduna state. The edict establishing it as a planning authority was passed by the State Military



Zaria Old City:
Showing aspects of
Traditional pre-
colonial setting



Colonial Township of
Sabon Gari: Planned
non-native residential
area



GRA: Planned former
European Colonial
Township (ERA):
Spacious low density
developments



Kwangila: Example of
new peripheral
uncontrolled sprawl
areas of Post-Colonial
establishment



Kabama : Example of
the few planned post-
colonial areas,

Figure 4. Typology of Development Patterns of Zaria Urban Area (Photographs by Author. December, 2017).
Source: Author (2016).

Administration in 1985 (Kaduna State Government, 1985). Its primary responsibility is to plan, manage and control development in the designated Zaria Urban Area as defined by an overly ambitious radius of 20 kilometres from the centre of the city. The specific functions of the Planning Authority include the following:

(1) To administer, execute and enforce the provision of the Planning Law (initially, the 1946 Northern Nigeria Town and Country Planning Law (Northern Nigeria Government, 1946) and presently, Urban and Regional Planning Law, - Decree 88 of 1992 in the designated area (FGN, 1992)

(2) To plan, promote and secure the physical development and environmental improvement of the area by acquisition, management and disposal of land and other property and carrying out building, engineering and other operations

(3) To formulate, monitor, control and co-ordinate the physical development policies, plans and programs within the planning area.

It is clear that the existence of the Planning Authority and its functions are tied to the planning laws establishing it as cited above. Although there are major differences in the provision for the institutional structure for the administration of urban planning, both the 1946 Nigerian Town and Country Planning Law and the 1992 Urban and Regional Planning Law made provisions for the planning of all major settlements by a Local planning Authority. The planning includes general plans (Master / Physical Development Plans) and subject plans addressed to particular urban development issues or like urban renewal or the planning of new residential areas or other land uses. Both also clearly state the institutional responsibilities for the plan preparation and implementation, which rest primarily on the Planning Authority.

However, there seems to be major difficulties, both administrative and legal, constraining the performance of the planning authorities (Nwaka, 1989). Perhaps most striking evidence of this is the inability to fully implement the 1992 planning law. Thus, the law, which is a Federal law, has yet to be adopted by the Kaduna State Government where Zaria is situated. In effect, although a legally established institution, the Planning Authority's operations are presently curtailed as far as the capacity to undertake urban planning activities as provided by the laws is concerned.

This is the precursor to the apparent ineffectiveness of planning activities by the Planning Authority as it places the institution in a rather obscure and frequently conflicting position in relation to other public institutions, notably the Local Governments. Due to this position, the institution also suffers functional identity crises in government policies, which in turn affect its capacity to attract adequate budgetary allocations commensurate

with its roles. In turn, the circle of uncontrolled urban development is further entrenched as the Planning Authority, which has the technical and legal disposition to guide the growth of the city becomes powerless in the face of fast developments in land speculation and construction activities.

IMPLICATIONS

There are some critical implications with resounding effects on the pattern of urban growth arising from this situation as observed in similar circumstances: (Audu, 2008; Caldeira, 2017).

1) The informality of the process of access to land deprives planning and other authorities of vital information on developments as they occur. Planning interventions to reverse or correct them, come belatedly and end up being endorsements of whatever has occurred. In certain instances, attempts at controlling developments by planning authorities through demolishing of buildings become very controversial and costly.

2) The lack of institutional control also provides the condition for land sub-divisions by individuals to proceed unabated, further entrenching the lack of planning.

3) Disorder in the pattern of development and scale of the urban sprawl makes the provision of infrastructure and services difficult. The provision of access roads, water supply, open spaces and other public facilities is hindered; resulting into the slum-like conditions that the newly developed areas quickly assume.

4) Informality also implies absence of documentation and record keeping. Thus, not much information is available on land ownership and types of developments contained.

5) Because of the predominance of the informal system of access to land, auto-construction is bolstered. Developers proceed with projects with hardly any controls or reference to any formal planning schemes.

Conclusions

The dynamics of informal urban growth, what is often described as urban sprawl, reflects the effects of a combination of economic, demographic, environmental and spatial governance forces. The growth will be fashioned in its character and pattern in relation to the details of these forces, which would determine its extent and character. Of particular relevance in this paper is the role played by the land and planning administration in determining whether this growth is accommodated through formal planning or not and whether it proceeds in a controlled manner or otherwise. In the colonial era, as illustrated by the case of Zaria, the institutional, legal and administrative processes for land and planning administration have proved to be very effective in designating specific areas for urban growth, formalising,

documenting land ownership, preparing, and implementing layout plans for the different areas so designated. This has left a legacy, which, despite the availability of much more human and material resources and greater urgency to instil the ethos of modern town planning has not been maintained.

The submission in this paper had been that the trends towards failure in sustaining the legacy of colonial town planning are a common thread among Nigerian cities. The explanations are not farfetched, but the resolve towards reversing the process is well short of the requirements. A first step towards this is to realise what is going on and ring the alarm bells, which was the main business of this treatise. This should resonate both in town planning practice and in theory as it concerns Nigeria and similar situations worldwide.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Analyzing spatial and non-spatial factors that influence educational quality of primary schools in emerging regions of Ethiopia: Evidence from geospatial analysis and administrative time series data

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Education is the most powerful instrument to transform socioeconomic status of given society. However, education will be only more effective when its quality is sustained. Education without quality is a gun without bullet. In developing countries there are number of factors that affect education quality. However, little is known about those factors. Therefore, this study seeks to identify spatial and non-spatial factors affecting quality of primary education in in Emerging Regions of Ethiopia. As methodology, descriptive survey design was used as the research strategy. Key informant interview, focus group discussion and field observation were used to collect primary data. Secondary data were also collected from reports, policy documents and research outputs. Efforts have been made to triangulate the collected facts. In order to interpret spatial analysis of accessibility and service area coverage, maps were prepared using Geographical Information System (GIS). Based on the quantitative and qualitative analysis, this study found that low teachers' qualification, low teachers' motivation, limited teachers' building capacity, ineffective school leadership, low participation of parents, lack of adequate school facilities, overcrowded classes, low quality of classrooms, high pupil teacher ratio, and lack of instructional materials were some of the non-spatial factors that lower education quality. The study further asserted that from the total area of the city, 32% was well accessible, 20% was moderately accessible, 5% fairly accessible and the rest 43% was not accessible at all. Based on all findings, it can be said that the Ethiopian government has a long way to go to deliver quality education to its citizens. Based on the results, it was recommended that to improve education quality efforts must be doubled on developing national and particularly regional educational system that are responsive to existing multiple challenges. Institutional, administrative and leadership reforms are mandatory to escape from this devastating situation.

Key words: Distribution, emerging region, elementary, Gambela, quality, school, service area.

INTRODUCTION

Education is the main driving factor for economic, social and political transformation since human civilization (Islam et al., 2016; UNICEF, 2014). Education is a basic human right and it plays an indispensable role in bringing

broader social, economic and cultural benefits (Tarc, 2013). In this regard, developed countries have been exerting massive efforts to assure quality education (Biggart et al., 2015). However, development of

educational system in developing countries was not as good as that of developed countries (Birchler and Michaelowa, 2016). Empirical evidences vividly have shown that education quality in developing countries is discouraging (Jones, 2016). World development report (2018) also explains that sub-Saharan African countries are the most affected countries by education quality crisis. Particularly, ineffective leadership, poor teachers' training program and low teachers' salary are some of the non-spatial factors that influence education quality in emerging regions (Jana et al., 2014).

In other perspective, locational distribution, service area coverage and accessibility of schools are the basic spatial factors that affect education access and quality (Ogunyemi et al., 2014). Geographical location and spatial distribution of primary school in developing countries are characterized by uneven distribution that commonly limit the level of accessibility, which in turn affects education quality (Fabiya and Ogunyemi, 2015). Uneven distribution of schools not only affect education access but it also affects education quality (Oluwadare and Olujimi, 2011). In conjunction with spatial distribution of the schools, availability of adequate physical infrastructure plays vital role in improving student's educational achievement (Urwick and Junaidu, 1991). When schools lack physical infrastructures such as water supply, playfield, library and teaching equipment, students' learning interest can be declined (Akomolafe and Adesua, 2016).

In the same line of thinking, education system of Ethiopia also shares the aforementioned challenges. In Ethiopia where 60% of its population belongs to pastoral and semi-pastoralist way of life, the issue of providing equitable, accessible and quality education is becoming challenging assignment for the local governments (FDRoE, 2015). Particularly, for emerging regions like Gambella Regional State education system is challenged by multifaceted problems. Despite remarkable achievements in expansion of educational institutions in the region, lack of access to quality education is one of the hot issue in the education sector. The true marriage between education access and education quality in schools were not met. Primary evidences showed that poor quality of education depends on a number of spatial and non-spatial factors, which are emanated from human, physical and material resources. Therefore, this study was aimed to analyze spatial and non-spatial factors that influence educational quality in emerging regions of Ethiopia by considering Gambella city as case study. Furthermore, the ambition of this study was to provide a policy options to improve and restore education quality in the emerging regions.

DATA AND METHODS

Description of the methodology

By their nature, factors that influence education quality emanate from spatial and non-spatial dimensions. The non-spatial factors are more associated to the existing economic, social, cultural and historical, religions, political and environmental contexts. Whereas, spatial factors are more associated with geographical location because education system can be positively or negatively influenced by the geographic location of education institutions. Distance to school, spatial distribution and accessibility of education institutions are some of the factors that influence education access and quality. Accordingly, data collection of this study was based on a qualitative and quantitative research approach. Qualitative data were used to assess perception of teachers, students, principals, parents and school administrators towards education quality. In contrast, quantitative data were used to measure distance, accessibility, distribution and service area coverage of the schools and their impacts on education quality.

Data sources

The data used this study were obtained from primary and secondary data sources. Primary data were collected from spatial and non-spatial data sources. The spatial factors were mainly collected from GPS reading, aerial photo and land use plan of the city, which was used to extract location of the existing educational institutions. Spatial information of education institutions have been converted into spatial data layers and stored in the Geographic Information System data database. Non-spatial primary data were collected using key informants interview, focus group discussion and field observations. The perceptions and reflections of key informants (teachers, students, principals and parents) were entertained by using focus group discussion, key informant interview and public hearing approaches. On top of this, a number of documents on nation-wide education policy and strategies regarding developing countries were reviewed. In addition to this, relevant education related reports, correspondences, minutes and archives of the local government of the study area were also analyzed (Table 1).

Method to identify factors affecting education quality

Non-spatial factors

As is clearly stated in the background, quality of education is influenced by multi factors. Nazluli et al. (2017) argued that factors that affect education quality are several and context dependent. As general conception, education quality can be influenced by non-spatial factors, which emanate from social, political, administrative, environmental and technological backgrounds. By their nature, non-spatial data are expressed in terms that are mainly expressed by reflections and perceptions of participants. Hence, during the course of this study, the perceptions and reflections of students, teachers, principals and parents were collected, using key informant interview, focus group discussion and public hearing meeting approaches. Field observations were also conducted in order to grasp experience on quality, functionality and overall

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Table 1. Data sources of survey on education quality in Ethiopia emerging regions.

Type of data	Data description	Data type (formats)
Spatial	Satellite imagery(world view)	Digital
	City land use plan (2017)	In CAD and GIS (shape file)
	City land use inventory (2017)	In CAD and GIS (shape file)
	City boundary	GIS (shape file)
Non spatial	Norms and standards	Literature review from federal urban planning manual
	National education annual report	Report
	National education policy and strategy document	Report
	Statistics report from central statistics agency	Report
	Master plan report	Report

performance of the education service delivery in the study area. Under this, evidences were gathered using photograph and eyewitnesses.

Spatial factors

Under this method, spatial factors that have direct and indirect impact on education quality were analyzed using geospatial tools. Here, spatial distribution, accessibility and service area coverage of the existing primary education institution were analyzed by using ArcGIS Network Analyst extension to identify which area of the city is well serviced and none serviced. In this regard, concentric service areas were generated to show how accessibility varies within a given distance. Once service areas were created, it was possible to identify how much of them were well, moderately or poorly served. ESRI also acknowledged that service areas created by network analyst helps to evaluate accessibility of given social services.

Analysis approach

The analysis was mainly rooted in identifying spatial and non-spatial factors that affect education quality in the study area. Hence, the objectives of this study were analyzed in terms of education quality indicators such as pupil-teacher ratio, class-student ratio, served population, availability of school infrastructures (toilet, bath, water supply, electricity and library). In addition to this, the quantitative data that deal with geographical location (distribution, accessibility, service coverage and distance from the center of the school) were analyzed using geospatial tools and administrative time series data. In order to interpret spatial analysis of accessibility and service area coverage, maps were prepared using Geographical Information System (GIS).

Software used

A set of analytical software were used to assist analysis of quantitative data. In this study, popular geospatial tools like arc GIS version 10.5 and CAD (computer-aided design) were used to analyze the spatial data. In the other hand, the qualitative data or the non-spatial data were analyzed using Microsoft Excel and SPSS. In such cases, calculation of percentages, proportions, ratios, averages, and comparison of figures with national standards were used as approach to interpret the research findings (GIS Software, 2018)

RESULTS AND DISCUSSION

Non spatial factors affecting educational quality

Reflections from key informants and focus group discussants

During discussion with key informants and focus group participants, it was underlined that there were potential factors that negatively influenced education quality in emerging regions. According to participants of the survey, the present education quality is at its lower level. Detailed survey specially made by the Ministry of Education of Federal Government of Ethiopia (2015) confirmed that education quality of primary education in emerging regions is not promising. From the same source, although encouraging results have been obtained in promoting access to primary education over previous decades in the contrary, education quality was not attained at expected level. Education Quality Assessment Report by UNICEF (2014) also indicated that the dramatic increase in enrolment in Ethiopia has resulted quality challenges including high student-teacher ratios, insufficient classrooms, inadequate learning materials and a lack of trained teachers. This is also more pressing issue in the emerging regions.

Qualitative interviews confirmed that there were different non-spatial factors affecting education quality. According to participants' perception, the major non-spatial factors that negatively influence education quality emanate from cultural, economic, political and technological backgrounds. From the cultural perspectives early child marriage is mentioned as main cause for low performance of the students. Economic issues also play significant role in education quality. In the first place, teachers' salaries are not attractive for most teachers. Secondly, students from poor families are the most disadvantageous as they cannot get additional reference material and teaching aid. Lack of technological inputs like radio, tape recorder and internet access were also raised as factors to lower education quality. Empirical

Table 2. Comparison between the numbers of population served in education institutions and the nation standard in Ethiopia emerging regions.

Educational level	Existing schools	Population size standard per institution	Average population	Number of required schools	School gap
Pre-primary school (k1-kg3)	05	1,000- 2,500	1750	42	37
First cycle (1-4) and secondary cycle (5-8)	12	12000- 18,000	15000	05	No gap
Secondary first cycle (9-10)	03	10,000- 15,000	12500	06	03

Source: Gambela City Administration Education Office, 2018 and Urban Planning Manual, 2017.

study also witnessed that primary schools in Ethiopia lacked technological inputs. As nation-wide evidence, 33, 67 and 89% of primary schools could not benefit, respectively, from radios, tape recorders and video recorders (FMoE, 2015).

Interviews with parents, students and principals asserted that shortage of instructional material, lack of qualified teachers, limited instructional inputs, shortage of classrooms, lack of school facilities and equipment were pointed out as underlying non-spatial factors affecting educational quality in the city. On top of this, the low-level standards in terms of teaching material, student desks and black boards were some the indicators challenging the education system in the city. According to Jana et al. (2014) “ineffective leadership, poor training of teachers, low salary of teachers, limited and often ineffective and problematic professional development opportunities for teachers, a focus on quantity rather than quality, a weak economic environment and low participation of parents” are underlying factors that affect educational quality.

Ngigi et al. (2012) also acknowledged that educational sector in developing countries was facing numerous challenges such as, lack of infrastructural and human resources, poor accessibility, imbalance between demand and supply, not enough school facilities. The other factor influencing quality of education in the study area was related to turnover of teachers and their least motivation. A number of studies also reported that teachers’ motivation was a crucial factor to assure education quality and it plays marvelous role for realization of the teaching objectives (Abazaoğlu and Aztekin, 2016).

Factors affecting educational quality from empirical evidences

Number of educational institutions and served population

Experience has shown that capital cities of developing countries are recognized as primate cities. As matter of fact, today capital cities of developing countries are suffering with over crowdedness, high rate of

unemployment, housing problem and lack of adequate social services, which mainly include health and education services. Gambela city, which is the capital city of Gambella regional state, also shares the same characteristics. Theoretically, it is understood that when population size increases at alarming rate, local governments will be under pressure to supply adequate service to residents. Global reports also witnessed that urbanization in developing countries are posing substantial challenges. Particularly demographic pressure is creating huge burden in the education sector (UNISCO, 2017). In the same line of thinking, as Gambela city is one of the primate city in Gambella regional state, the number of educational institution were not in position to go with dramatic increase of the population size (Table 2).

As shown in Table 2, based on the national urban planning manual, 37 additional kindergarten were identified as gap. Besides, the city also need 03 secondary first cycle (9-10) schools to be built in the city to fill the gaps. This fact indicates that in addition to issue of education quality, there was also an issue of education accessibility problem in the study area. This implies that there is no balance between the growing population size and number of existing educational institutions.

Analysis of pupil-teacher ratio (PTR) as quality indicator

Educational quality is always measured by different indicators. Among those indicators, pupil-teacher ratio (PTR) is one of the most important indicator. According to Naisujaki et al. (2017) to ensure effectiveness in teaching and learning process supplying adequate and quality teachers is mandatory. UNESCO (2009) stated that ratio of pupil-teacher (PTR) in most developing countries is higher. Pupil-teacher ratio (PTR) in developing countries estimated that over 84% classrooms had over 40 pupils per teacher and this is more acute in Sub-Saharan Africa and Asia (Mulei et al., 2016). In Ethiopia, the standard set for pupil-teacher ratio (PTR) is 50 at primary and 40 at secondary level (FMoE, 2017). However, in actual condition it was beyond those limits. For example, Addis

Table 3. Students-class room parity in governments' primary schools.

S/N	School name	Grade level	Number of students			Rooms	PTR	National standard
			M	F	Total			
1	Eley praymery	1-8	1003	1046	2049	20	1:103	1:50
2	Wibure	1-8	914	932	1846	17	1:109	1:50
3	Ras gobna Pra	5-8	777	657	1434	16	1:90	1:50
4	Dalekoch	1-8	1438	1158	2596	17	1:153	1:50
5	Chnkware	1-5	877	788	1665	15	1:111	1:50
6	Jejbe	1-5	123	132	255	5	1:51	1:50
7	Terkidi	1-4	196	211	407	6	1:68	1:50
8	Elay	9-10	380	462	842	10	1:84	1:40
9	Newland Seco	9-10	410	210	620	8	1:78	1:40
10	Preparatory	9-12	1323	833	2156	26	1:83	1:40

Source: Gambela City Administration Education Office, 2018.

Ababa has the lowest PTR at 24 students for every teacher in primary school. Emerging regions like Ethio – Somali has the highest PTR at 63 students for every teacher (FMoE, 2017). In similar context, this study has found that pupil-teacher ratio (PTR) in Gambela city ranges from 50:1 to 60:1. This was happening because students' enrolment have grown without supply of adequate teachers. Accordingly, this high ratio of PTR is becoming one major factor that affects education quality in the study area. According to Gökçe et al. (2016), highest pupil-teacher ratio (PTR) affects student's self-confidence, co-operation, and sense of belonging and behavioral changes; while small pupil-teacher ratio (PTR) promotes participation and confidence of the students.

Analysis of pupil section ratio as quality indicator

Having pleasant outdoor education environments and classrooms are prerequisite for achieving efficient and effective educational system. Figueroa et al. (2016) and Blatchford et al. (2011) argued that the number of students in a class is a primary factor affecting the quality of education. In Ethiopia, pupil section ratio (PSR) has disparities among all regional states. For example, Gambella regional state has the biggest variation between cycles, with 114 in the first cycle compared to 77 in the second cycle. Pupil section ratio (PSR) is lowest in Addis Ababa indicating that students in this region have better access to class room and so are for quality education. Nationally, the average pupil section ratio (PSR) is 43 for primary school (FMoE, 2017). However, as it can be seen in Table 3, the student-class room ratio in Gambela ranges from 1: 50 to 1:153. This implies that there were limited number of classrooms in each school. In actual sense, during the field visit, it was noticed that classrooms were overcrowded and there was competition for the resources (book, chair and facilities). Blatchford et

al. (2011) clarifies smaller classes led to pupils to get attention, support and can create active interaction among pupils and teachers. In the contrary, higher students in class cannot participate in the class and interact with their teachers. This all conditions can result lower performance of the students and hence education quality.

Analysis of gender parity index as quality indicator

In this contemporary era, having balanced gender parity index is considered as indicator for good education access and education quality (White et al., 2016). With regard to Ethiopia, still the gender parity index (GPI) issue has visible disparities. For example, currently Gambella regional state has gender parity index of 0.92, Ethio somali 0.78 and Oromiya 0.87 (FMoE, 2017). In similar way still in Gambela city there is gender disparity in the primary schools (Table 4).

Analysis of physical conditions and facilities of schools

Physical condition of classrooms and their internal facilities have direct and indirect impact on teaching and learning process (King'oina et al., 2017). However, schools in developing countries are suffering from lack of school facilities and substandard class rooms (Ngigi et al., 2012). When schools are not equipped with facilities like play fields, recreational areas and other outdoor services social bonds among students will be declined (Nepal and Maharjan, 2015). This situation will harm students' effort to share knowledge and to work in team spirit in the teaching and learning process (Button et al., 2013) In Ethiopia government's reports witnessed that education institutions lack adequate infrastructures and this is more acute in emerging regions. For example,

Table 4. Gender parity index by school level.

S/N	School name	Grade level	Number of students			Gender Ratio (%)	
			Male	Female	Total	Male	Female
1	Eley	1-8	1003	1046	2049	48.5	51.5
2	Wibure	1-8	914	932	1846	49.5	50.5
3	Ras gobna	5-8	777	657	1434	54.2	55.8
4	Dalekoch	1-8	1438	1158	2596	55.0	45.0
5	Chnkware	1-5	877	788	1665	53.0	47.0
6	Jejbe	1-5	123	132	255	48.0	52.0
7	Terkidi	1-4	196	211	407	48.2	51.8
8	Elay	9-10	380	462	842	45.0	55.0
9	Newland	9-10	410	210	620	66.0	44.0
10	Preparatory	9-12	1323	833	2156	62.0	48.0

Source: Gambela City Administration Education Office, 2018.

Table 5. Availabilities of school facilities in Gambela city.

S/N	School name	Electricity	Water supply	Lounge	Library	Play field	Work shop
1	Eley	Yes	Yes	No	No	No	No
2	Wibure	Yes	No	No	No	No	No
3	Ras gobna	Yes	Yes	No	No	Yes	No
4	Dalekoch	Yes	Yes	No	No	No	No
5	Chnkware	No	No	No	No	No	No
6	Jejbe	No	No	No	No	No	No
7	Terkidi	No	No	No	No	No	No
8	Elay	Yes	Yes	No	Yes	No	No
9	Newland	No	No	No	No	No	No
10	Preparatory	Yes	Yes	No	Yes	No	No

Source: Gambela City Administration Education Office, 2018.

only about 33% of all primary schools have electric supply, 67% have radios, 33% have tape recorders and 11% have video recorders (FMoE, 2017). In similar way in Gambela city, key informants were stated school environment was not attractive for being schools were not equipped with necessary facilities like toilet, bath, library, recreational space and office facilities. As it can be seen in Table 5, out of the ten schools only 60% have electricity, 50% have water supply, 100% have not launch, 80% have not library, 90% have not play field and 100% have not workshops. This implies that lack of those facilities has great impact on the education quality.

Spatial analysis of education institutions (spatial distribution and accessibility)

Spatial distribution of primary schools

Locations of schools are advised to be located with reference to population density, proximity and accessible to target population (Mustapha et al., 2016). However,

Fabiyi and Ogunyemi (2015) conformed that spatial distribution of primary school in developing countries are characterized by uneven distribution that commonly limit the level of accessibility which in turn affects education quality. It is also true for Gambela city that primary schools are unevenly distributed (Figure 1) about 70% of the primary schools are located in the central part of the city. This vividly indicates that some segment of the community are more advantageous while others are suffering due to absence of adequate access to education institutions. As per the key informants, there were significant number of students that travels more distance to access the nearest school. For this reason, many students were came late to classes. Bramasta (2015) witnessed that uneven distribution of educational institutions not only deny accessibility but also greatly affects education quality.

Adequacy of space for primary schools

Ministry of Works and Urban Development (MWUD)

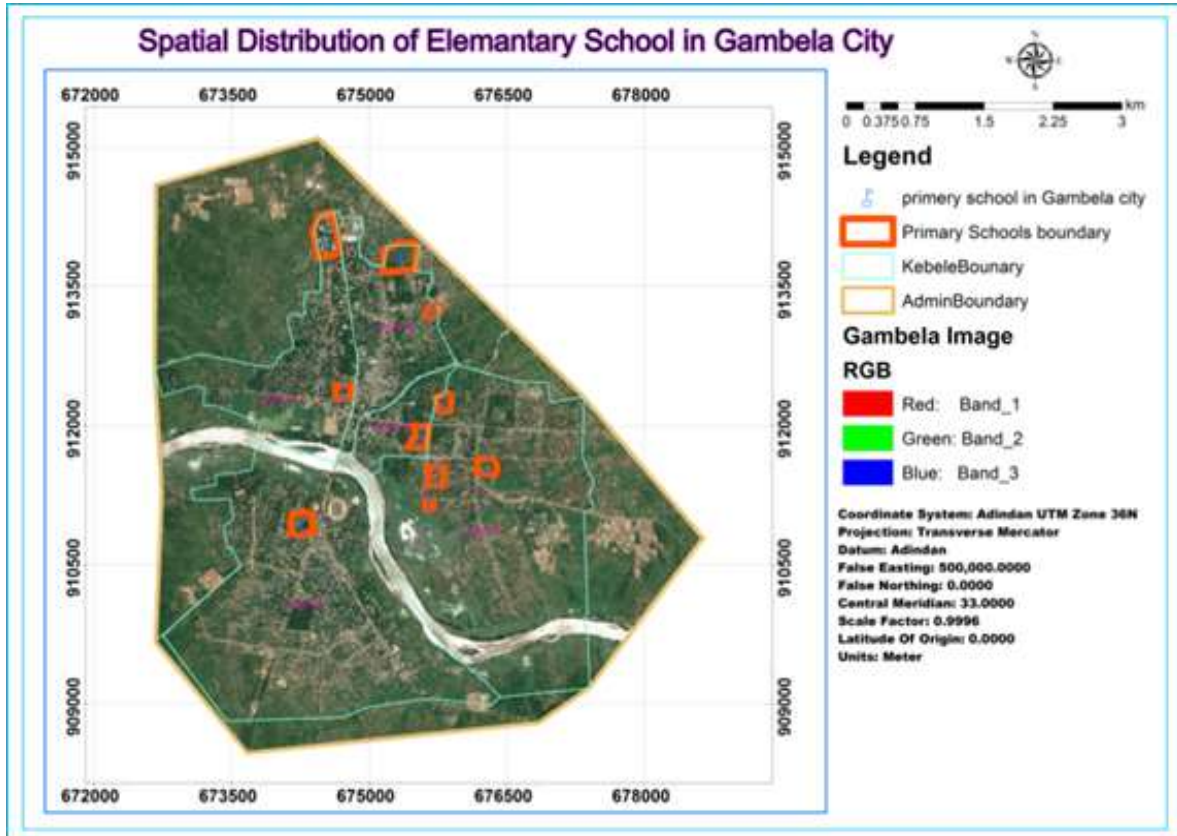


Figure 1. Spatial distribution of primary schools in Gambela city, 2018.
Source: Satellite image of the city, 2018.

(2017) in its urban planning implementation manual issued that 1.5- 2.5 ha land is required for placing primary school. This space is required not only for the hard landscape (building and road) but it is also for facilities like play field, green area and other outdoor services. In this perspective, most of the existing schools in Gambela city have met the national standard except one school (Table 6).

Analysis of primary school service area catchment/ accessibility

In urban planning, catchment area is an area from which service providing institution attracts service demanders. Accordingly, school catchment area is geographic radius from which students are eligible to join schools. Urban planning institutions and firms often used catchment area as criteria to locate new schools. In Ethiopian urban planning practice, distance to school is measured by catchment area. For example, primary school is said to be accessible when students travel less than 3 km (MWUD, 2017). Cunningham et al. (2014) and De la Fuente et al. (2013) also argued that effective planning requires better understanding of available resource, targeted population and spatial distributions of needs and

service coverage that can show where services are matched to needs and where there are coverage gaps. Pengfei et al. (2014) also argued that spatial accessibility is an important index to evaluate distribution of educational facilities. Hence, this study also found that spatial distribution and service area catchment of the existing schools were not matched with the total settlement pattern and population density. According to key informants, each school has priority service areas in which students can get admission. However, in real practice schools suffer to accept students out of the predetermined service area catchment. This is happening due to different factors. The first factor was there was rural- urban and urban –urban migration to the city and the students' enrolment were increased from time to time. The second factor is the awareness to send children to school has shown tremendous increase. The last, but not the least, reason was the number of schools do not grow parallel with the population growth of the city. This all conditions have direct impact on education quality. If student cannot get education access in her or his neighboring, it always has economic, social and cultural impact on the student learning process, which in turn has also significant impact on education quality. In the same context, in Gambela city there were considerable

Table 6. Adequacy of space for primary schools in Gambela City.

S/N	School name	Existing area (ha)	National standard area (ha)	Implications
1	Eley	5.0	1.5 – 2.5	It has space for future expansion
2	Wibure	2.2	1.5 – 2.5	within limit
3	Ras gobna	3.8	1.5 – 2.5	It has space for future expansion
4	Dalekoch	3.2	1.5 – 2.5	It has space for future expansion
5	Chnkwere	3.1	1.5 – 2.5	It has space for future expansion
6	Jejbe	2.5	1.5 – 2.5	within limit
7	Terkidi	1.4	1.5 – 2.5	It is below the standard
8	Elay	2.5	1.5 – 2.5	within limit
9	Newland	8.5	1.5 – 2.5	It has space for future expansion
10	Preparatory	3.7	1.5 – 2.5	It has space for future expansion

Source: Extracted from GIS data base, 2018.

Table 7. School service area catchment of the existing primary schools in Gambela city.

Total city boundary	Accessibility level up to 3km	Distance coverage (m)	Area in (ha)	Accessibility within city boundary (%)
2716 ha	1557 ha or 57% is only accessible in the radius of 3km	0-1000	880	32
		1000-2000	545	20
		2000-3000	132	5
		>3000	1159	43
		Total	2716	100

Source: Spatial analysis of service area coverage by GIS (2018).

students that get education access out of their service area. This is mostly demonstrated in students coming from periphery of the city (Table 7 and Figure 2). As it can be seen in Figure 2 and Table 7, 57% of the total city boundary is accessible up to 3 km, whereas 43% of the city boundary is beyond the maximum service area. According to urban planning manual (2017), the maximum service area for primary school is 3 km radius. When school service area stretches beyond 3 km, it will not be accessible to students. The study further asserted that from the total area of the city, 32% was well accessible, 20% was moderately accessible, 5% is fairly accessible and the rest 43% was not accessible at all.

Conclusion

Education is a corner stone for all socio economic transformations. Especially, primary education system plays indispensable role to harvest responsible, ethical and competent future citizens. It is true that the positive impact of education is only achieved when there is quality education system. However, there are visible indicators that education quality has not been still fully achieved in developing countries particularly in emerging regions where most communities belong to pastoral and semi-

pastoralist way of life. Despite remarkable achievements in expansion of educational institutions in the region, lack of access to quality education is one of the hot issue in the education sector. The true marriage between education access and education quality in schools were not met. The study evidence showed that poor quality of education depends on a number of spatial and non-spatial factors, which are emanated from human, physical and material resources. This study found that low teachers' qualification, low teachers' motivation, limited teachers' building capacity, ineffective school leadership, low participation of parents, lack of adequate school facilities, overcrowded classes, low quality of classrooms which were seemingly deteriorating, high pupil teacher ratio, lack of instructional materials, shortage of textbooks and uneven school distributions were the underlying causes for the low education quality in the study area. Based on all these findings, it can be said that Ethiopian government has a long way to deliver quality education to its citizens. Based on the results, it was recommended that improving education quality must be based on developing national and particularly regional educational system that are integrated and responsive to those multiple challenges. Institutional, administrative and leadership reforms are mandatory to escape from this devastating situation.

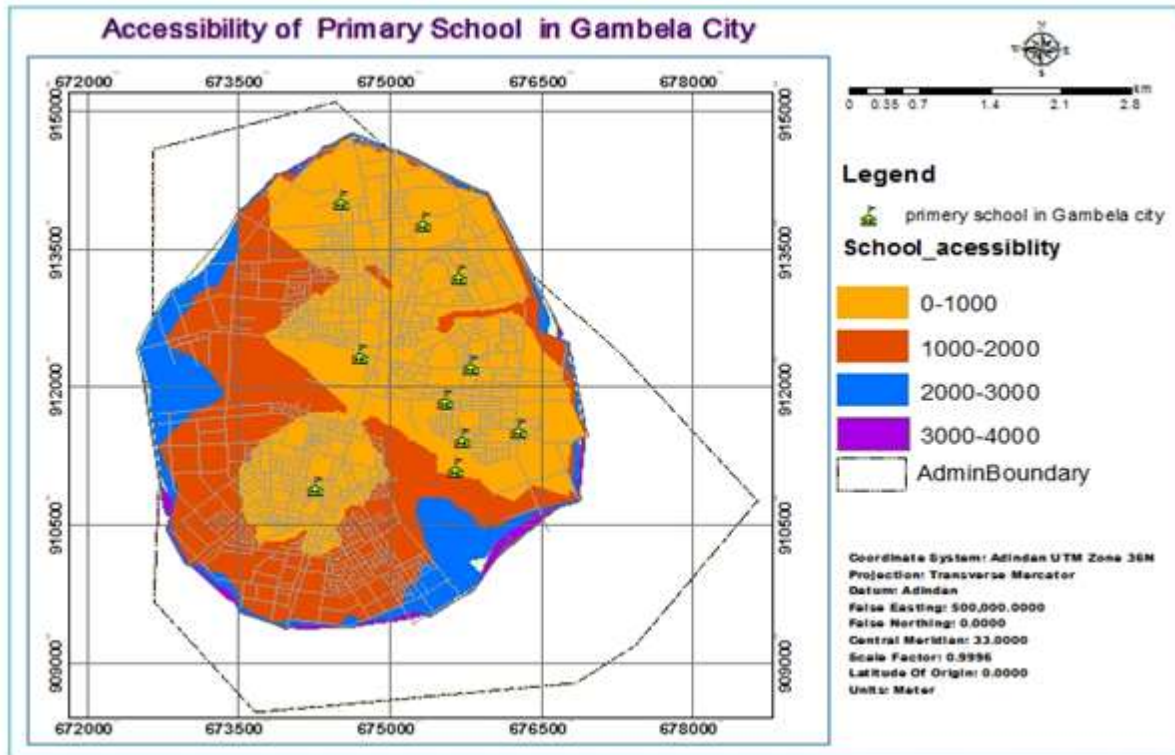


Figure 2. School service area catchment of the existing primary schools in Gambela City.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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