



APPLICATION OF GEOSPATIAL TECHNIQUES IN TRACING THE EVOLUTION AND DEVELOPMENT OF MARKET CENTRES IN GOMBE, GOMBE STATE, NIGERIA.

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Abstract

This study, "The Application of Geospatial Techniques in Tracing the Evolution and Development of Market Centres in Gombe, Gombe State" employed spatial data and historical written literatures of the state to examine the origin

Keywords:

Geospatial Techniques, Evolution, Market Centres, Settlements, Population.

and development of market centres, the proceeding development that led to the current state of

INTRODUCTION

The history of transaction in commodities and the offering of services in society is as old as the origin of human existence. No individual has all it takes for meeting the basic needs of life and so each has to obtain some of these basics from another while one offers some goods or services required by others. In this sense, the satisfaction of human needs is complimentary. A society's volume of retailing and commercial activities portrays the level of its economic development and standard of living (IBIS World, 2004, cited in Dan, 2009). The form of trade in early human organisations

market centres as well as contributing factors of distribution. The research revealed that the number of market centres that evolved through the five phases stretching from 1800 to 2017 increased proportionally as population: phase 1 had 2 market centres with 16,000 people, phase 2 had 4 markets with about 25,000 people, phase 3 had 7 markets with 47,000 people, phase 4 had 10 markets with 208,000 people and phase 5 had 16 markets with more than 400,000 people. Also, identified factors that led to the observed growth from above statistics included capitalization of the town as the headquarter of the Emirate and Gombe Division in 1919 and subsequently the capital city of Gombe State in 1996, centrality of the town surrounded by medium and lower order central places, and high number of immigrants from different parts of the state and country at large. The study recommends that growing settlements should observe and monitor the location of their market places so that they conform to the standard of centrality and ease of access to collection and redistribution of goods and services within the market thresholds.

consisted of economic transactions characterised with barter. This form of trade graduated into use of various forms of items like cowries for exchange as practised in some African communities. Eventually the use of more portable and convenient currency for exchange emerged as the currencies presently used by nations in transactions. The most recent is the use of e-transaction in trade.

Increases in population and production of excess goods and agricultural products led to trade and so market places for meetings became paramount and times were fixed for such meetings. Apart from exchange of goods and services, market places also provide opportunities for socialising, security and the pursuit of peaceful co-existence of the neighbouring communities (Dabanjo, et al. 2015). As population grows from single family units to clans and villages, settlements grow larger leading to greater need for exchange of goods and rendering of services.

Consequently, market centres sprout up and commercial activities involving more people in the surrounding settlements emerge. The increases in population of communities in a region results into increased commercial transactions and establishment of more market centres and trade areas.

Very few works relating to market centres in Gombe State have been carried out by researchers. Particularly, little has been done on the evolution and development of market centres in the state and these include those of (Tiffen, 1974) and Land Development Master Plan of Gombe State (2004). This research work is specially undertaken in order to trace the evolution and development of market centres in Gombe, Gombe State, Nigeria using geospatial techniques that considered historical records and satellite imageries to detect the evolution and growth of market centres in the study area.

HISTORICAL EVENTS IN THE ESTABLISHMENT OF GOMBE AND COMMERCIAL ACTIVITIES

Earlier Settlers and Founding of Gombe settlement

Gombe as a settlement has its origin in the nineteenth century when the Emirate was founded by a Fulani Moslem, BubaYero, who received the Sokoto Caliphate Flag in 1804. The Emirate consisted of the region at the bend of the Gongola River flowing from a north westerly direction from the Jos Plateau, takes a bend around Nafada and heads southwards to join the Benue River at Numan. At the end of the nineteenth century the Emirate included the following ethnic groups: Fulani, Bolewa, Tera and Jukun. However, the southern ethnic groups occupying the hills consisting of Tangale, Waja and other ethnic groups were independent and resisted the raids from the Emirate. Then commercial activity was low and few settlements were involved viz: Gerikam, Nafada, Gombe Abba, Barmi, Ako, Pindiga, Kalam and Gwani (Figure 1). Total population of Gombe Emirate in 1916 was 16,000 (Tiffen, 1974).

Gombe Town was established in the southern part of the Emirate in 1919 when the capital was moved from Nafada to Gombe Doma. Reasons advanced for this action were centrality and administrative control (Aliyu

et al. 2000). Important developments when Gombe Town was founded in its present site included the opening of the new Kano – Bornu road which reduced traffic flows through Gombe villages in the northern part of the Gongola River. Also, United African Company (UAC) depots, a colonial administrators trading outfit, was relocated from Nafada to Dadinkowa. This chain of events led to reduced trade and political importance of the Emirate and resulted into emigration from the northern districts. The population of the Emirate in the south increased following the influx from the north as from 1919. Moreover, the increase of population in the southern part of the Emirate was facilitated by the ruler-ship in Ako District to the west of Gombe who encouraged immigration into the district.

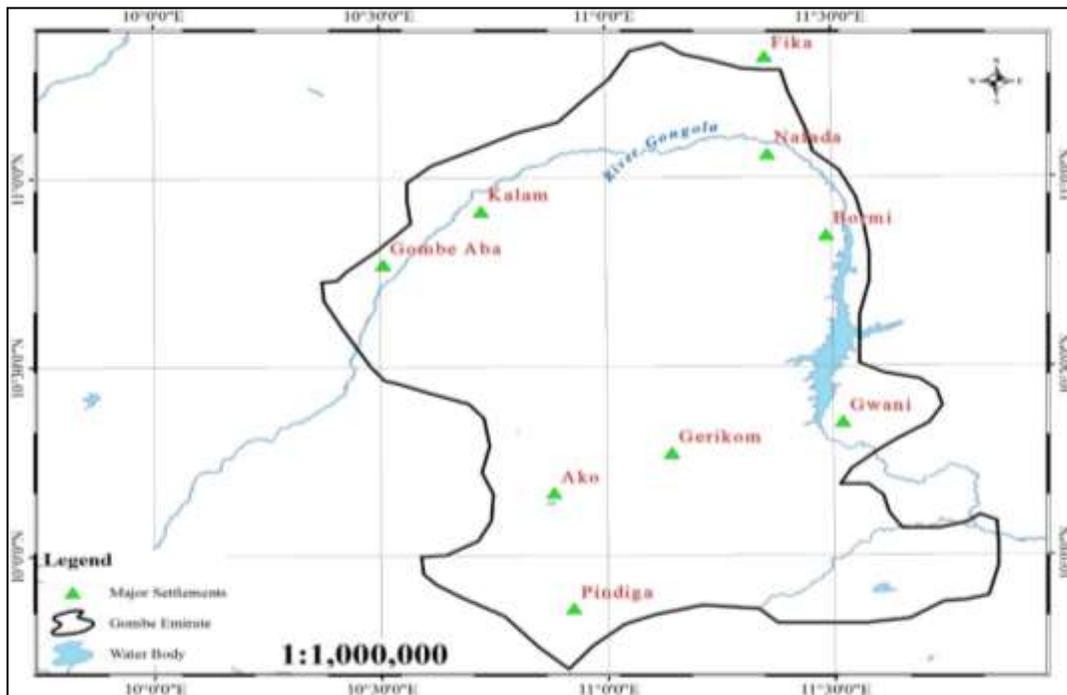


Figure 1: Gombe Emirate 1900

Source: Tiffen (1974)

New market centres evolved in the southern part of the Emirate due to the immigration and these included Gombe town, Kumo and Dadin Kowa. Notwithstanding immigration was at a very low ebb in the 1930s – early 1940s due to the effect of World War II. The other reason advanced for this

situation is the falling prices of cattle and groundnuts, the main products traded in the southern part of the Emirate. However, after World War II trade however increased due to the construction of Gombe – Jos road as well as rise in food prices that favoured the sale of cereals and livestock. In addition there was accelerated growth in population in the 1950s when cotton production and sale stepped up, yet in the mid-1960s growth in population fell when the prices of cotton dropped. From the proceeding account therefore, it is evident that there was corresponding relationship between the growth of population and boost in commercial transactions on the one hand, and political stability, increased agricultural production and livestock on the other.

Transport development and commercial transactions in Gombe Emirate and neighbouring regions

Transport is an important infrastructure needed for development in any region and no form of socio-economic upliftment takes place without an efficient transport system set in place. The absence of transport facilities counteract development in any region including those rich in resources such that it should be understood that transportation gives life to a region's economy. Related to transport development are population size, resources and technological development which in turn affect the commercial transactions and sprouting of central places. The main means of transport as at the time the British colonized Nigeria was the use of canoes on creeks, lagoons and rivers, and animal backs for example donkeys, camels and oxen. For shorter distances loads were carried on the head or shoulder.

Transport infrastructure is indispensable for commercial transaction and particularly for the evolution and development of market centres. In her study of transport and commercial activities in the rural communities of Gombe Emirate in the 1950s Tiffen (1974) found that "better communications stimulate their markets and benefit their farmers". In response to inquiries, the village heads highly rated transportation (as most desired) and rate markets (as second desired) for socio-economic upliftment of the farmers (Table 1). The importance of transport in early periods of the development of Gombe region and the evolution of market centres is also evidenced in the linkages of road transport from Nafada

(capital of the Emirate and headquarters of the Division 1913 – 1919) through settlements as Bagi, Wakaltu, Tongo, Dukul, Jurara, Deba Fulani, Lubo, Difa and DebaHabe to the southern Independent district of TangaleWaja residing on the hills (figure 2). Settlements along the route from Nafada to the Independent District of TangaleWaja served the roles of collection and redistribution of goods. Then, goods transaction consisted mainly of agricultural products from the communities and some exotic goods that came in from the colonial administrators trading companies like UAC through Nafada. In discussing the importance of transport to commercial activities she also pointed out that the extension of the new railway in 1963 to Gombe led to sizeable influx of immigrant farmers into Deba Fulani, a village on the rail line near Gombe. In addition greater number of traders were drawn to Deba Fulani market while the local traders built permanent shops and more services as tailoring and bicycle repairs were offered.

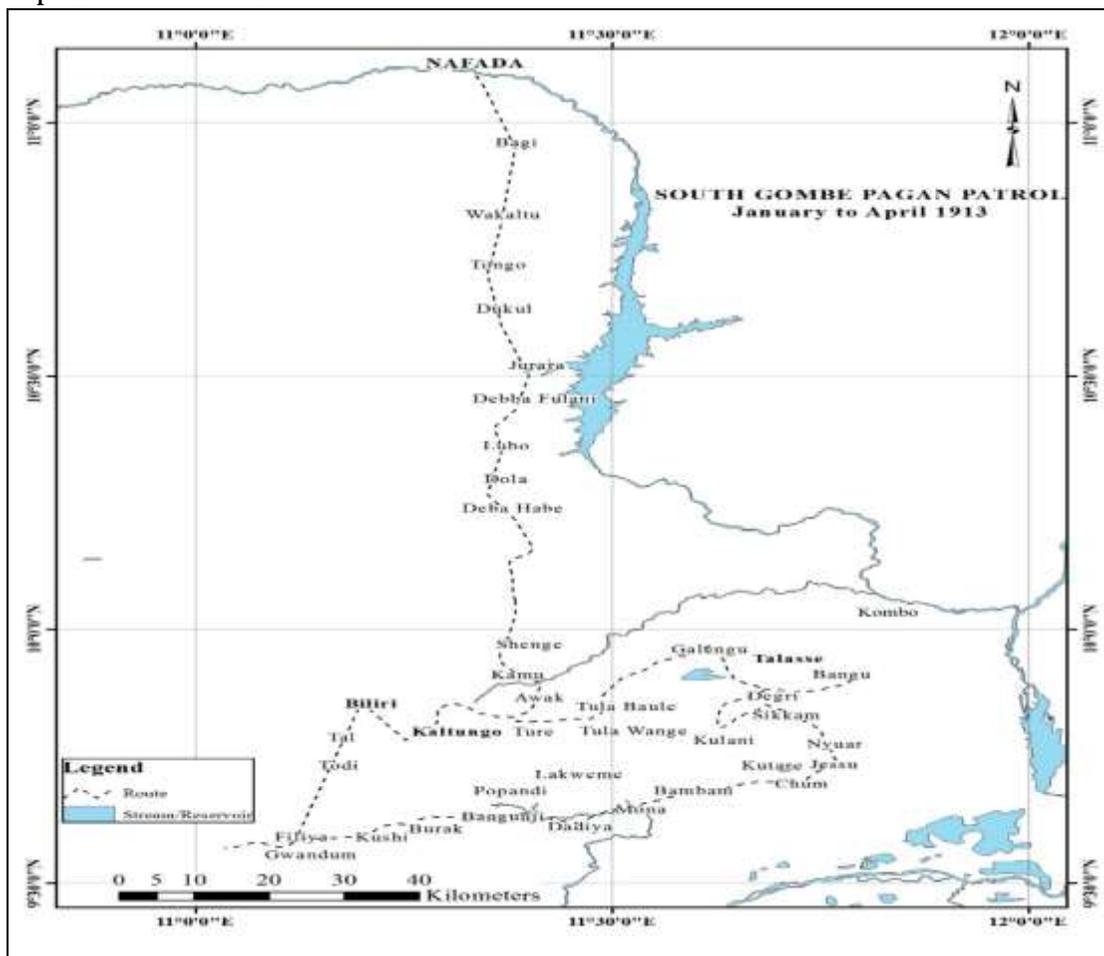


Figure 2: Colonial Masters Route (1913)

Source: Tiffen (1974).

Table 1: Improvement desired by 18 Village Heads in Gombe Emirate

No. of individuals	Type of improvement	Comment
15	Transport improvement	Mainly better roads; also railway brunch line and better river transport
12	Improvement in marketing facilities	Mainly better market stalls, slaughter slabs, etc. Nafada and Kumo wanted Post office and banks
10	Improved medical facilities	Mainly dispensaries
10	Improved water supplies	Mainly wells, in bigger places – Kumo, Nafada, Pindiga,, Deba Habe, Pumping system and taps
7	Schools	
5	Assistance to farmers	Tractors hire (2) or Ploughs (1),

Source: Field work (Tiffen 1974)

In the south the Emirate included Pindiga and Kumo Districts and had its capital in Gombe Abba, 1825 – 1902, from where also the colonial administrators started operating. Thereafter, the headquarters of the Emirate and Gombe Division was transferred to Nafada as decided by the British colonial administrators. Further events that informed the developments of transport networks in the region include, taking advantage of the natural waterway of the Gongola River and establishing a river port at Nafada in 1907, five years after Nafada became the capital of Gombe Emirate and headquarters of Gombe Division.

The location of the river port at Nafada was with the view of using the Gongola River to reach Bornu. This strategy worked well for the colonial administrators as it opened the way for products like gum Arabic, silk and ostrich feathers for export to Europe using the bulking centre of Nafada. Imported goods from Europe included textile and exotic goods. The town

Railway transport is one of the notable legacies of the British administration in Nigeria. The construction of the railway system in the country was primarily for the purpose of penetrating and opening up of economic zones in the interior for evacuation of raw materials and semi-processed agricultural products. The construction of the railway line initiated in 1898 progressed steadily and the Lagos-Kano line was completed in 1912, Jos in 1915 and Gombe in 1963 before terminating in Maiduguri. Products transported from Gombe to the seaports for export to Europe during colonial and post-colonial era included cattle and bales of cotton which was semi-processed in ginneries in Kumo and Gombe.

The laying of road and railway network opening economic zones and connecting provincial headquarters led to increased production of agricultural products like cotton and groundnuts as well as livestock, larger volumes of trade, increased incomes in rural and urban sectors, and higher demand for consumer goods and services (ibid).

AIM AND OBJECTIVES

The aim of this study is to trace the evolution and development of market centres in Gombe town using geospatial techniques. The following objectives will be used in achieving the aim:-

- i. Identify the events leading to the founding of Gombe town
- ii. To find out the factors that contributed to the growth and development of market centres in Gombe State in the following phases 1800 – 1930, 1931 – 1952, 1953 – 1963, 1964 – 1991, 1992 – 2017.
- iii. Examine the origin, evolution and growth of Gombe town market centres over the study period using geospatial techniques.

METHODOLOGY

Primary and Secondary Data Sources

S/ N	Data	Data type	Sources	Resolution/remark
1	Coordinates Locations	Primary	Garmin GPS Device	Coordinates were obtained in both UTM (Universal Transverse Mercator) and DMS (Degrees Minutes and Seconds)
4	- Landsat TM (Thematic mapper) 1991 and 2003 and - Landsat ETM(Enhance Thematic Mapper) 2017,	Secondary	National Centre for remote Sensing Jos, 2017	Resolution 30m×30m
5	Google Earth Imageries	Secondary	Google Earth Pro Application	Downloaded in Jpeg format Altitude 200metres and georeferenced in ArcGIS 10.5
7	Topographic Maps	secondary	Ministry of State land and Survey	Obtained in hard copy, digitized and georeferenced in ArcGIS 10.5

Gombe,
Gombe
state and
Tiffen, M.
1974

Source: Authors Analysis

Data analysis

This study employed geospatial techniques to analyse and examine the evolution and development of market centres in Gombe town. For the study, historical aerial photography and satellite imageries were acquired for 1991, 2003, and 2017 from National Centre for Remote Sensing Jos and Google Earth Pro Application. Also, historical oral and written reports of Gombe region and town from several literatures, field assessment reports that included interviews with major ward/district heads provided the basis for understanding the points that led to the present status of Gombe town. Supervised image classifications were used in ArcGIS 10.5 to determine the statistical values of major land uses e.g. built up areas as at different periods as obtained from the satellite imageries and historical aerial photographs. For the analysis and discussion, the period covered 1900 to 2017 and were examine in sub period or phases. A detailed investigation of the products, commercial activities, clearings with market centres, state of evolution and development were discussed subsequently according to the sub periods of 1900, 1931, 1953, 1964, 1992, 2017.

The materials used consist of combination of several types and sources of data, and the use of statistical and descriptive evidence to supplement each other produced a sufficiently accurate foundation for this study.

RESULT AND DISCUSSION

The evolution and development of market centres in Gombe has been traced to the early part of the 19th century and split into five phases according to history and associated changes in the state Gombe region and

later state. The phases of the emergence and development of markets in Gombe are as follows:

Phase 1: Gombe Emirate – 1800 To 1930

The period of 1800 to 1900 marked the beginning of the growing adoption of Islam and trade in the northern part of Gombe Emirate. The major commercial activity at this phase of study mainly included agriculture and craft work. The districts in the Emirate consisting Gombe Abba, Nafada, Dukku and Ako depends mainly on their local resources and therefore, there was low volume of trade between them until the coming of the British administration in 1913. The inhabitant of the Emirate then only practiced subsistence agriculture and raised livestock. Market centres and areas developed in Gombe Emirate at this period included Gombe Aba as the capital of the Emirate (1804 – 1914), Nafada, Bormi, Gerikom, Ako, Pindiga and Gwani. The peak period (1913 – 1930) of this phase showed increased commercial activities which was tied to the presence of the bulking centres at Nafada and Dadin Kowa. The period also witnessed the rise of Gombe Doma and surrounding settlements as market centres in the southern part of the Emirate (Tiffen, 1974)

Phase 2: Gombe Emirate – 1931 To 1952

This is a transition period that marked the dominance of colonial administrators as well as the presence of Christian missionaries in the southern part of the Emirate. Until this period, extreme southern part of the state e.g. areas known as the Tangale Wajawas not part of the Emirate but was subjected to the administration of Gombe Division. Increased communication and transport networks in the Division led to more commercial agricultural product e.g. groundnut and cotton which were transported in large quantities especially from the southern part of the state to the main capital of Gombe Doma now referred to as Gombe town. These products were then moved by the colonial administrators to sea ports of Porthacourt and Lagos for shipment to the United Kingdom. Some linear settlements developed along the road networks and these included Kafarati, Gadam, Kwadon, Debba Fulani and Baure. The settlements

function as major deports or market centres of commodities. At a point in time, between 1940 and 1950, commercial activities dropped due to the effect of World War II that resulted in low patronage of products such as cotton, groundnut, and animal skins etc. the British colonial administrators were diverted by the war (Ibid).

During this phase of World War II local production for trade and commercial activities were very minimal as products were not traded to the British as earlier done. Consequently, the evolution and development of market centres were not common and so, only Gombe Doma and surrounding settlements like Kundulum played the role of market centres.

Phase 3: 1953 – 1963

This is the period between the end of colonial rule and the beginning of independent state of Nigeria. Remarkable events in Gombe State as at the period included increased road network development i.e. extension of Gombe to Yola road, and some ancillary roads linking settlements in the Division. Other settlements also started evolving along the road network links. By 1963 the railway network reached Gombe town and this development led to the sizeable growth of local and integrated trade. Built up areas in Gombe Town in this period included Government Reservation Areas, British Cotton Ginnery Association (Bogo), Jekadafari, Gabukka, Shamaki, and Dawaki ward site. Market centres evolved prominently in this period and these were Old market (TsohonKasuwa), Grain Market (TudunHatsi), and Kasuwan Mata in Shamaki ward (Figure 4). The Railway Station was also a commercial centre for selling and buying of goods. Also, the street connecting the Old market to the railway was strewn with giant commercial stores like UAC and John Holt for easy to foreign goods and evacuation of local products (Ibid)

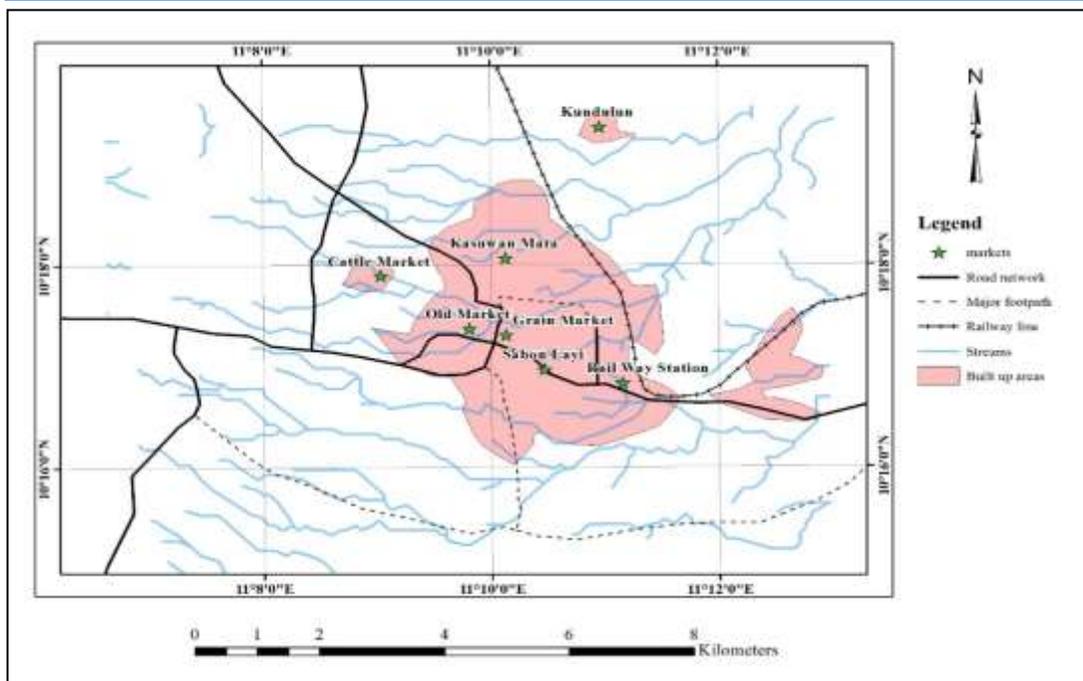


Figure 4: Gombe town: Market centres – phase 3 1963

Source: Adopted from Gombe Master plan, 2004

Phase 4: 1964 to 1995

At this stage, there was a substantial development that took place after the independence of Nigeria. These include the segmentation of the country into states rather than the former northern and southern protectorate. By 1991, about 29 states were created though the present Gombe state was merged with Bauchi state. During this period Gombe town witnessed a significant growth in population and there was high influx of immigrants from western and southern Nigeria, consisting of the Igbo and Yoruba who engaged in petty trading along the present SabonLayi (SabonGari) road. Their presence in this area led to the evolution of market centres known as Kasuwan Dare. Other market centres that evolved in this period included the cattle market (Tike). These newly evolved market places in Gombe town added to the number of market centres in phase 3 (Figure 5) which give a total of 7 market centres. Main commodities traded in the markets centres in Gombe in this period included general goods in the “Old Market”, grains in “TudunHatsi”, livestock in “Tike”, foodstuff in “Kasuwan

Dare(SabonLayi)" and "Kasuwan Mata" Table 2. The sprouting of more market centres in Gombe town over the years and particularly in phase 4 and 5 is adduced to increases in population of the township (Table 2), improved transportation network, high volume of trade in the region and greater number of people engaged in commercial activities in the state. Commercial activities kept on increasing as the town grew in population especially with the immigrant traders of the Yoruba, Igbo and Hausa. Main streets in the town extending from Jekadafari in the west to Bogo in the east had higher volume of commercial transactions.

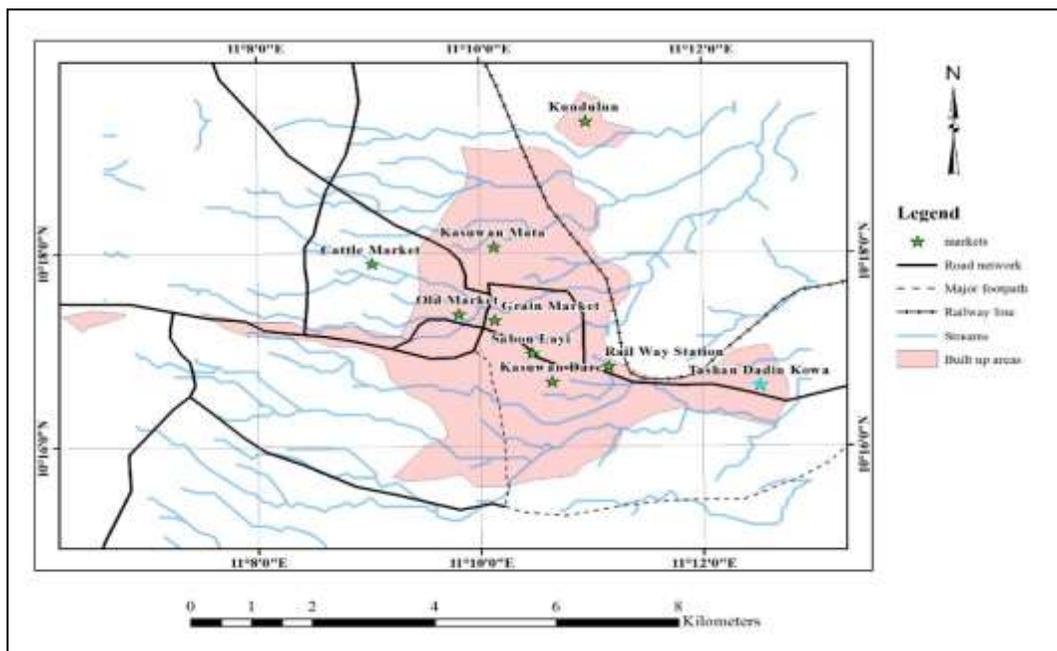


Figure 5: Gombe town: Market centres – phase 4, 1991

Source: Adopted from Gombe Master plan, 2004

Phase 5: 1996 to 2017

Gombe State was carved out of the former Bauchi state in 1996 at the beginning of this phase of the evolution and development of market centres in Gombe region. The period is known for increased trade in exotic commodities and greater expansion of market centres and trade areas, many manufactures found in most part of the market centres come in from outside the country and from large cities like Jos, Kano, Lagos and Porthacourt. More market centres have evolved while the old ones in

Gombe town have expanded. New market centres in the town are Arawa, market, Bogo market, Tumfure market, Bagadaza market, Pantami market and Liji market (Figure 6). Commodities traded in the additional markets are mainly general goods and foodstuff. These new market centres are smaller in sizes than the New Main Market and so are lower in the hierarchy of market centres in Gombe town and their market areas (thresholds) are also smaller.

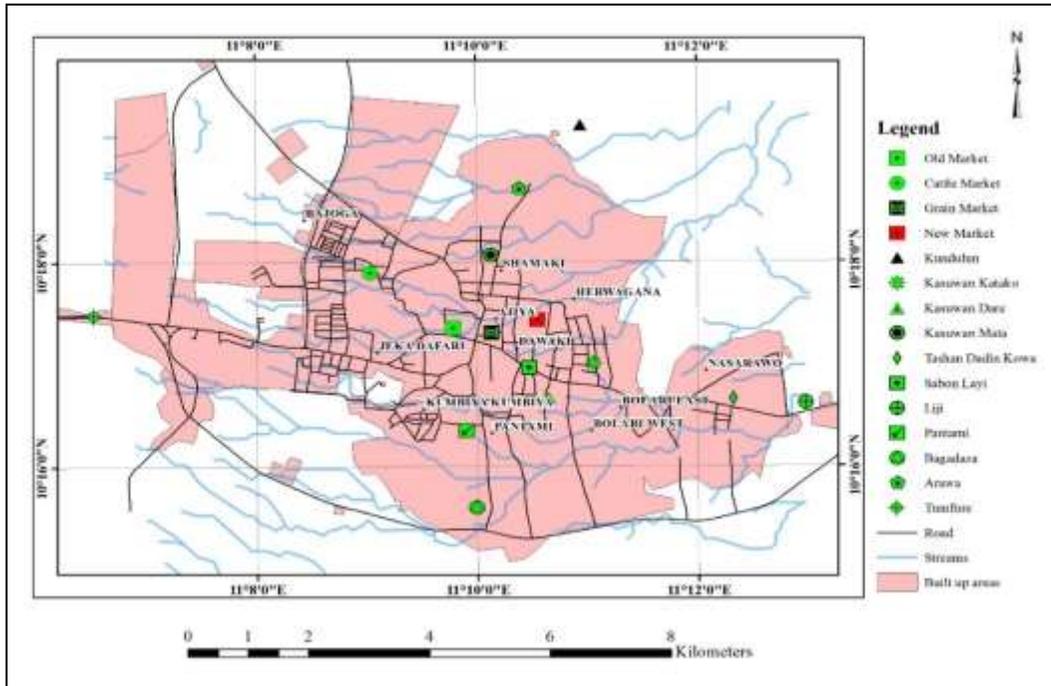


Figure 6: Gombe town: Market centres – phase 5, 2016
 Source: Adopted from Gombe Master plan, 2004

Table 2: Population, market centres and goods transacted in Gombe Town (1800 – 2017)

Phases	Period	Estimated population (Gombe Emirate)	Estimated Population Gombe Town	No. Of market centres at Gombe Town	Main commodities in the market

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1	1800 - 1930	161,882	16,000	2(Kundulun and OldMarket)	Craft work i.e. Mats, pots etc and agricultural products such as cotton
2	1931 - 1952	202,989	25,000	4(Kundulun, OldMarket, Cattle Market and Grain Market,	Groundnut, cotton, animal skins, cattle and livestock
3	1953 - 1963	358,330	47,000 (1963)	7 (Kundulun, OldMarket, Cattle Market, KasuwanMata, Railway Station, SabonLayiStre et, and Grain Market,	Cotton, groundnut, animal skins, general goods, cattle and livestock
4	1964 - 1995	630,895	208,000 (1995)	10 (Kundulun, Old Market, New Market, Cattle Market, Kasuwan Mata, Railway Station, SabonLayi Street, Kasuwan Dare, TashanDadin	General goods, Automobiles, grains, livestock, Banking and finance.

				Kowa and Grain Market,	
5	1996 – 2017	3,000,00 0	400,000 (2017)	16(Old Market, New Market, Cattle Market, Kasuwan Mata, KasuwanKatak o, SabonLayi Street, Kasuwan Dare,TashanDa din KowaArawa, Bogo, Tumfure, Bagadaza, Liji, Pantami, Mile 3 and Grain Market,	General goods, automobiles, telecommunicati ons, Banking and finance, ICT, Postal services, grains, cattle and livestock etc.

Source: Authors Analysis

Summary

This study traced the evolution and development of market places in Gombe town using geospatial techniques that involved the use of historical records and satellite imageries to detect the growth of built up regions within the study periods and market centres. The study divided into phases, revealed that Gombe town grew from a settlement of several hundreds of people of less than 500 known as Gombe Doma in 1919 to the present capital city of more than 350,000 population. This rapid growth in terms of development and population led to the evolution of many of the present market centres in order to meet the demands of goods and services of immigrants. The study commenced by looking at the origin of Gombe, Gombe Emirate and Gombe Division and then the present state. These

events pointed out the centrality of the town before getting a state where the capital has been Gombe town since 1996 and these led to the evolution and development of higher order market centres and lower order ones in smaller settlements of Nafada, Dukku, Bajoga, Kwami, Kaltungo, Billiri, Kumo, Pindiga, Balanga etc. The study also revealed that centrality in locating market centres contribute greatly to rapid development because customers tend to always move shorter distances to get supplies at lower cost than far distant market centres.

The centrality of Gombe town has not served only administrative purposes as thought by colonial administrators in moving the capital of the division from Nafada to Gombe, but it has served as a central place in terms of the spatial distribution of market centres (Dan Y. et al, 2018). Gombe town has the highest order market centre as well as high concentration of market centres in the state which collected and redistributed commodities from within the state, other states and beyond.

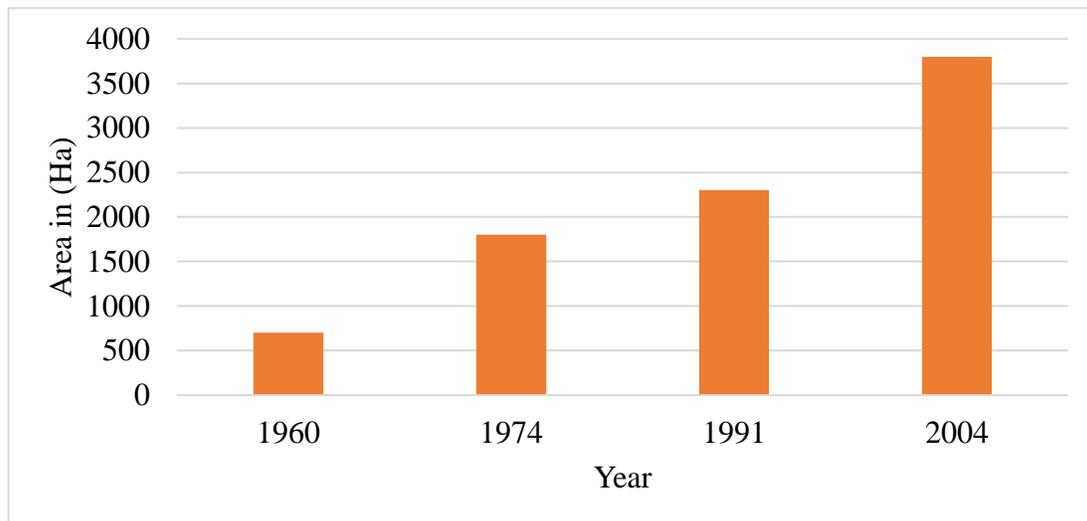


Figure 7: Growth of Gombe town 1960 to 2004

Source: Gombe State Ministry of trade and commerce

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Periods	Population Gombe Emirate	Population Gombe town	Product Commercial activities	and Settlements with Market Centres	State evolution of market centres	of Remarks
1900 - 1930	161,882					
1931 - 1952	202,989					
1953 - 1963	358,330					
1964 - 1991	630,895					
1992 - 2006						
2007 - 2017						