Urban Development and Environmental Degradation in and around Gombe Metropolis, 1960-2006

Usman Isah Ya’u

Abstract

The interface between urban development and environmental degradation in and around Gombe Metropolis is historically traceable to the colonial period when in 1919 Gombe town was created as a seat of colonial administration of a Division and Emirate. In 1996, the town assumed the Capital of Gombe State. Located in a fertile land, the town with time has become vulnerable to exploitation of its ecological endowments. This paper examines how the concentration of people, unplanned urban expansion, infrastructural development, and the continuous production of goods and services in and around the Metropolis led to natural resources depletion, erosion, garbage accumulation, noise and air pollution, with all its attendant health and environmental problems. It assesses government and non-governmental organisations, private individuals and communities’ efforts to mitigate environmental degradation in and around the Metropolis from 1960-2006 A.D.
Introduction

Environmental degradation is a real ecological phenomenon that affects humanity in different parts of the world. In the North-Eastern Region of Nigeria within which Gombe is located there have been visible signs of environmental degradation which over the years attracted the attention of geologists, geographers, historians and sociologists. Among others, Ostaficzuk study of the geological formations around the Chad Basin in the North-East revealed that the land forms, soils and water bodies in the region have changed considerably due to complex natural and human factors such that the discharges of the rivers, lakes, streams and watersheds in the region have gradually diminished as a result of drought, among other agents of ecological change. Not only that the water in the rivers, lakes and streams has receded, but also the table water in most wells (both in the first and second aquifers) has lowered significantly. He also observed that the physical landscape of the region had been modified and the soils are affected by erosion, wind deflation and accumulation and by man-initiated bush fires. Fricke, a geographer, has also studied the impact of human activities on the geographical landscape of the North-Eastern Nigeria since 1952, showing the extent to which the land had been progressively degraded. He argued that the physical environment of the semi-arid Zone of Nigeria had been generally speaking fragile/vulnerable and therefore subject to ecological hazards associated with climatic fluctuations and the increase in the number of people who put increasing pressure on the region’s arable land and other ecological resources.

Bashir’s historical study of the North-Eastern environment has shown that the region at some point in the past was one of the well-endowed parts of Nigeria in terms of human and ecological resources, but overtime the region’s natural resources has been depleted in the quest for development and earning the means of livelihood through intensive agriculture. Consequently the region has over the decades been gradually and persistently pushed onto the fringes of the desert, thereby leading to soil impoverishment, sharp decline in the agricultural production resulting from declining rainfall and periodic occurrence of famines and droughts, which in turn led to unemployment, poverty, and socio-economic and political instability in the region. Shehu and Molyneux-Hodgson have, from a sociological perspective, also explained the process of environmental degradation based on the perception of faith communities in certain North-Eastern States of Nigeria. Their narratives on environmental degradation centred on desertification, deforestation, soil erosion, flash floods, garbage accumulation and natural resources depletion. The causes of the environmental degradation
have been interpreted in the light of the divine transcendental and human factors. They argued that beyond the notion that human sinful acts angered God to cause environmental problems, anthropogenic issues and government less concern on environmental sustainability has contributed to the worsening of environmental condition in the region. These scholars discussed the theme of environmental degradation at a wider, though regional level. In this paper focus would be on the urban space where wide ranging activities of many people have further accelerated the process of environmental degradation in the urban and semi-urban landscapes of Gombe Metropolis between 1960 and 2006.

**Conceptual Clarification**

The term urban denotes a connection with towns and cities peopled by different cultural and ethnic groups, who engage mostly in non-agricultural, but complex socio-cultural, economic and political activities and service delivery in order to earn a living. Mabogunje defined urbanisation as „a social process which seeks, through maximum specialisation, to increase the output of goods and services in a community.’ Urban development in this paper is a process of social change, differentiation and specialisation in the utilisation of space specifically chosen for the establishment of a town or city with municipal institutions and infrastructural facilities for the use and administration of diverse people (urbanites) who agglomerate and relate in socio-cultural, political and economic ways, resulting overtime in the expansion of the urban space and the modification of the ecological landscape within which the town or city is located.

Metropolis is a term use to describe a large capital city of a particular state or region. It is connected with a large urban settlement where different activities take place. A considerable number of the urbanites in the metropolis came from communities far and near in order to live, work and earn a means of livelihood from the bureaucratic and commercial, small scale agricultural and industrial activities which characterised the urban economy that is connected to interregional and, or international socio-economic system. The metropolis isa ‘dependent entity’ on the international system largely controlled by the West, hence they functioned as dumping and redistribution centres for imported consumer goods and as the collection and evacuation centres for groundnut, cotton, cocoa, hides and skins, tin, and other exportable commodities which are processed into industrial finished goods. The production of these exportable commodities facilitated the process of natural resource depletion and environmental degradation in the urban and suburban spaces in Nigeria.
Environment, according to Ahmad, ‘is the whole natural system around us- the land we inhabit, the air we breathe, the water we drink, the food we consume, the products we use and throw away, the sun that heats us, the gasses we inhale and exhale, the spaces we travel through, the plants, animals, birds, fish and other species we deal with.’ The outer space of the universe with the heavenly bodies and the environment physical aspects of relief, soil, water, temperature, wind, plants and animals are interdependent components of nature within the biotic domain where holistic but complex interactions through exertive, competitive, parasitic, predatory, exploitative and generative means takes place among living and non-living organisms.

Environmental degradation is thus the process of changing the physical landscape of a particular geographical area in a manner that directly and indirectly affects human and animal ways of life. The process involves the destruction of the natural flora and fauna through deforestation and bush burning; soil, sheet and gully erosions; the blasting of rocks, mining and unlimited extraction of ecological resources; noise and air pollution; sand filling pools, streams and other aquatic sites and the construction of buildings on the sites, and waterways; lack of proper sanitation as evidenced in urinating and defecating in open places; the existence of open gutters, the dumping of refuse in undesignated areas and on waterways; improper handling of carcass; careless disposal of toxic waste, and solid waste (used plastic bags, can products, etc.); unplanned urban expansion and the development of crowded residential areas with all its attendant health and environmental implications. These are the characteristic features of environmental degradation induced by urban development which, manifested in and around the Metropolis during the period under study.

Geographical Description of the Area of Gombe Metropolis

Gombe Metropolis is located in the Sudan Savannah. The exact land area the Metropolis occupies is not known as it exceeds the land area of 105.45 sq. km2 of Gombe Town (which coincides with Gombe Local Government Area). The settlement has over the years expanded in all directions through urban sprawl and meets up with the built-up areas along its boundaries with Kwami, Akko and Yamaltu Deba LGAs of Gombe State. The environment within which the Metropolis is located has undergone ecological transformation over the centuries, which influenced its topographical and physical landscape. The area is a valley-like landscape, with a raised ground in the west and low-lying plain in the east. Rocks of varying types and sizes are scattered in the area, Dutsen Bisije (BCGA Hill) being the...
most gigantic geological formation lying in the eastern low-lying area. It is a crystalline basement complex overlaid by sedimentary rock with an altitude of 1784 feet above sea level.

Sandstone hills of lesser height and sizes dotted over the plains of the area. The weathering of the Gombe and Kerri-Kerri Sandstones and the overflow of the basaltic sediments of the Biu Plateau collectively influenced the nature of the light sandy to greyloamy and blackish clay soils, which spread from the western to the eastern parts of the area. The soils are susceptible to erosion due to the fragile nature of the escarpment of the area, in addition to human intervention with nature. The extensive undulating plains are etched with a network of streams that cut their way west-east through the plains, forming over time deep and wide gullies that are mostly dry except during the rainy season. The natural flow of surface water in the Metropolis has been eastwardly inclined, towards the low lying plain, and the water courses and gullies serve as drainage system in the area.

The climate and rainfall in the area being typical of the Savannah environment, have been influenced by air-fronts of the inter-tropical convergence zone which brings tropical maritime monsoon air that is eventually substituted by the tropical continental air mass which determine the circle of seasons: the three to four summer months with a short hot-and-dry period after which the rainfall starts and last for four to five months. Climatic fluctuations have affected rainfall pattern and precipitation in the area overtime. The area has an average rainfall of 853 mm per annum. Fricke asserted that rainfall in Gombe and nearby areas has sharply decreased by thirty per-cent (30%) from the 1950s to 1990s. This is evident in the shortening of the period of the seasonal rains. These are clear signs of the impact of climate change and environmental degradation in the area.

The vegetation cover around the Metropolis is characterised by dispersed leafed species of succulent trees. The vegetation has been tempered with resulting from urban expansion and long agricultural practice of intensive farming with short fallow periods; persistent firewood collection and continuous bush burning have thus prevented regeneration of tree growth. Except for certain carefully planted woodlot plantations and few large ‘native’ trees that survived the onslaught of the urbanites, the whole area has been reduced to a scrubland with patches of bushes and dense shrubs and grasses. It has been extensively cleared and developed as a built-urban environment. It is more or less a ‘concrete jungle’ created in the image and likeness of the urbanites. The destruction of the vegetation around the area had significantly affected wildlife. The trees that continue to flourish in the area
include Dorawa (Locust bean), Kuka (Baobab), Kadanya (Shea butter), Aduwa (Desert date), Tsamiya (Tamarind), Giginya (Dum), Goruba (Hyphaene thebaica), Dabino (Date palm), Durimi (Ficus polita) Zogale (Moringa oleifera), Dogonyaro (Neem), Madachi (Mahogany), Zaiti (Eucalyptus), Gamji (Ficus platyphylta), Rimi (Ceiba pentandra), Kirya (Prosopis Africana), Gawo (Acacia albida), Baure (Ficus gnaphalocarpa), Chediya (Ficus thonningii) and Rumfu (Allium ascalonicum). They are found here-and-there in and outside the Metropolis.

**Historical Background to the Evolution of Gombe Urban Centre**

The area where Gombe Metropolis now occupies was before 1919 dotted over by Kundulum, Mallam Inna, Doma, Bolari, Bomala, Madaki, Pantamiand Gabukka among other settlements under Akko District of Gombe Emirate. In 1919 Gombe Township was established as the seat of colonial administration of Gombe Emirate and Division following the transfer of the headquarters from Gombe Abba and Nafada. The area was ceded from Akko through colonial fiat and made the colonial administrative headquarters which provided a promising base for urban development as the area had admirable physical features and expanse of fertile land for agricultural and building purposes. The centrality of the administrative headquarters in terms of location made it accessible to and from any parts of the Division, thereby making it possible to effectively control and administer the people.20

Gombe Township was planned and built with residential, administrative, commercial and industrial sections. The Europeans lived in the Government Reservation Area (GRA) located at some distance from the Native Town where the Emir of Gombe, Emirate Councillors and other ordinary people that came from Gombe Abba and Nafada lived. Native Administration (NA) Central Office, Court-Houses, Prison, Dispensary, Veterinary Clinic, Public Works Department, Agricultural, Education and Native Police (Yan Doka) Offices were uniquely built with dressed stone at the administrative section of the Township. The Township Market (known today as Tsuhuwar Kasuwa) was located at a central position, along a main road thus making it accessible from all directions.21 The United Africa Company, London and Kano Trading Company, George Ben Ollivant) Multipurpose Stores operated at a site where Gombe State University is located today, before their relocation to a Commercial Area along the then Gombe-Yola (now Gombe-Biu) Road. Industrial area was created further away along the road, near Bogo village where Cotton Ginnery was established.
A number of social infrastructures such as schools, deep concrete lined wells, hand-pumped boreholes, roads, latrines and incinerators were provided in the Township, which was also linked up with, among others, Bauchi, Maiduguri and Yola by road. Feeder roads further connected the Township with outlying district headquarters, rural bulking markets and production centres which made it possible for human and material resources from within and outside the Division to move in and out of the Township Urban environmental sanitation and human waste management was observed as a number of public latrines and incinerators were constructed in different places in the Township and sanitary standards were institutionalised through the work of Sanitary Inspectors (Duba Gari).

Having realized the danger of the ecological problem related to unnecessary loss of the vegetation cover resulting from increasing desiccation and sand-drift in Northern Nigeria, the Colonial Government introduced combative measures in order to mitigate the environmental problem. Dum Plantation was created along the border of the British colony of Nigeria and the French colony of Niger. Green belt of shade-providing and drought resisting trees were planted in and around colonial urban centres in Nigeria, Gombe inclusive. Mahogany, Neem and other exotic species were planted along the Township roads and streets in addition to the Forest Reserves created around the Gombe - Liji Hills, and at a place near Akko and Dandadu which served as fuel and grazing reserves around the Township. The Forest Reserves were created on ecologically fragile soils. Only dead/dried trees could be felled for firewood, but felling of live trees for fuel-wood, farming, mining and hunting activities were prohibited in the reserved areas. Wild animals were also protected from being unnecessarily hunted and killed through a colonial legislation which empowered the Forest Guards (Malaman Daji) to deal with people found wanting of either encroaching the reserved areas or endangering wildlife. Grazing reserves and ranches with earth dams for livestock husbandry were also created in the outskirt of the Township and elsewhere in the Wawa Bush. Colonially induced large scale agricultural production led to unrestricted felling of trees which in turn caused soil erosion. The planting of quick growing and desert resistant shrubs such as Jatropha curcas (Bitadazugu) was encouraged round farmlands in order to check soil erosion. Drought resistant trees for wind break and other environmental uses were planted and gardens for the production of edible fruits were established in and around the Township.
Urban Development in Gombe Metropolis

The nature and character of urban development is determined by the number of people in a particular urban centre and the range of human activities taking place in the urban settlement. From the colonial to the post-colonial period Gombe Town/Metropolis witnessed remarkable population increase and demographic change over the years as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1923</td>
<td>3,000</td>
</tr>
<tr>
<td>1935</td>
<td>7,841</td>
</tr>
<tr>
<td>1954</td>
<td>18,483</td>
</tr>
<tr>
<td>1963</td>
<td>47,000</td>
</tr>
<tr>
<td>1991</td>
<td>209,000</td>
</tr>
<tr>
<td>2006</td>
<td>268,000</td>
</tr>
</tbody>
</table>

Over the years the demographic density in the area changed significantly. Gombe Township population density in 1952 was said to be above 20 inhabitants per square kilometre.26 By 1999, according to Fricke, ‘a new nucleus of high density above 200 inhabitants per km² has been established in Gombe Local Government following the creation of the new state of Gombe.’27 Balzerekha opined that ‘the foundation of the “Metropolitan Area of Gombe” - ten miles in diameter - which is based on population size, density and a high grade functions serving the hinterland, is the direct response to Gombe’s growing centrality.’28 Its centrality makes the Metropolis attract, like a magnet, different people from all directions, thereby making its demography multi-ethnic and multi-religious in nature. Different ethnic and cultural groups in Nigeria such as the Fulani, Hausa, Bolewa, Tera, Jera, Jukun, Tangale, Tula, Waja, Kamo, Lunguda, Pero, Kere-Kare, Guddiri, Babur, Kanuri, Kilba, Mbula, Marghi, Angas, Mangvul, Birom, Mada, Arago, Tiv, Idoma, Igala, Egbiria, Yoruba, Igbo, Edo, Ijaw, Urhobo and Itsekiri, to mention but a few, including foreigners are found working either in government establishments, private organisations and, or running their own businesses. These people have been living peacefully side-by-side in the Metropolis.
Explanations for the steady urban population growth and demographic development in Gombe over the decades can be related to the following: the construction of railway in the 1960s; the activities of the World Bank Supported Gombe Agricultural Development Project in the 70s and the development of agricultural and commercial activities; the creation of Gombe State in 1996 and the making of Gombe as the State Capital; the movement of many civil servants from Bauchi and other places after the creation of the State and the Government investment in capital projects in the State Capital led many engineers, bankers, consultants, entrepreneurs, among others to troop into the Metropolis seeking for contract and consultancy services, among other economic ventures. The search for employment opportunities in government and private establishments, organisations, and institutions also led to the movement of many youths into the Metropolis seeking for employment and, or political opportunities related to the democratic dispensation. The relatively recent crisis in Plateau and Borno States also led to considerable population drift from the crisis-hit areas to safer settlements such as Gombe Metropolis.

The inhabitants of the Metropolis had been provided with facilities for their wellbeing. Mention would only be made here of major landmark infrastructure and institutions constructed in and around the Metropolis that affects the lives of numerous people, without labouring to provide date and name of persons involved in the establishment of the facilities and institutions. The period after independence witnessed massive construction of infrastructures such as the railway whose extension from Jos-Plateau through Bauchi to Borno via Gombe in the early sixties was aimed at facilitating the process of the distribution of imported consumer goods and the evacuation of the exportable commodities produced in the North-East region. Other infrastructures provided include National Electric Power Authority Mega Station, the Nigerian National Petroleum Corporation Depot, 2500 Tonne Silo Storage Complex Strategic Grain Reserve, Nigerian Telecommunication (NIPOST), Federal Ministry of Agriculture Poultry Production, Veterinary and Livestock Services Unit, and many other Federal and State Ministries, Agencies and Parastatals.

Import Substitution Industries and Warehouses had also been established in and around the Metropolis: GASCO Oil Mill, Tam-Tam Cola Bottling Company (later renamed Azuma Bottling Company), Coca-Cola and Pepsi Cola Deports, Spinning Mill Factory, Paper Mills and Printing Press Houses, Rice Milling Sites, Nasara and WATCOT Ginneries, Gombe Fertilizer Company, Landa Woven Sacks, Bread Bakeries, Foam and Polygene Bag
Manufacturing Firms, Water Packaging and Bottling Companies, Blocks and Interlocks Producing Companies, to mention but a few. Commercial activities had been pronounced in Gombe New Market, New Commercial Area, Grain Market, Satellite Settlements’ Market Centres, Livestock and Timber Markets, Warehouses of European Firms and other Private Individuals, Provision Stores and Shops established in and around the Metropolis, just as Filling Stations, Truck Vehicle Repair and Service Centres; Garages and Workshops for Motorcar and Motorcycle Repair and Services, including that of Generating Sets, Machines and other Electric Appliances had been established in the Metropolis. Motor Parks, Plazas, Conference Centres/Halls, Hotels, Restaurants, Banks, Micro Finance Banks and Insurance Companies had also been established. Health Care Service Centres built in the Metropolis include General Hospital, Federal Medical Centre (now Federal Teaching Hospital), Privately Owned Hospitals, Maternities, Clinics, Pharmaceutical Chemists, Medical Centres and Stores. Local Government, State and Federal Secretariats; Courts and other Judicial Establishments; Military (301 Artillery Regiment), Police and MOPOL Barracks and Headquarters, including Para-Military Formations/Institutions had also been established in and around the Metropolis.

Several Nursery, Primary and Secondary Schools and Tertiary Institutions - the most notable being Federal College of Education Technical, School of Nursing and Midwifery, Gombe State University, including Islamiyya Schools and other related educational institutions had been established in and around the Metropolis. A number of Housing Development Units built in and around the Metropolis include State and Federal Low-Cost Houses, Orji, Shongo and Buhari Housing Estates; Labour, Investment and Federal Road Safety (financed by Federal Mortgage Bank) Quarters, including Judges and Legislative Quarters. The construction of all these housing units, institutions, and infrastructures, including building of stadia and the creation of grave yards in and around the Metropolis require spacious land areas which had been appropriated and cleared in the name of urban development.

**Environmental Degradation in and around Gombe Metropolis**

‘Gombe Metropolis is expanding at an alarming rate.’30 The expansion of the Metropolis in all direction sled to increasing population pressure on the arable land and the vegetation cover such that even the Forest Reserves created during the colonial period at strategic and ecologically sensible sites around the Metropolis had been affected. This has
been documented by Fricke, who conducted a research and reported in 1999 the consequences of deforestation around Gombe in the following manner:

The result is a decrease of the secondary bush vegetation (any primary woodland is scarce). Bare fallow show signs of sheet and gully erosion. Even Forest Reserves carefully developed and fostered during the colonial period have been cleared for farmland.

Farmlands had been enlarged into the bushland and even into Forest Reserves... increased soil erosion accelerated gully cutting as well as sheet erosion indicated by sand fans and silted water tanks (tapkis) are the result of this indiscriminate extension of farmland and deforestation.31

The destruction of the vegetation cover has been on-going, but the process accelerated with explosive rapidity during the post-colonial period resulting from the agricultural activities and the expansion of residential, institutional and infrastructural development. Roads construction led to the felling of green shelter belt of trees planted along Gombe Township Roads from the colonial period to the late 1970s. The Mahogany trees planted, for example, along the Biu-Gombe-Bauchi Road, from the Ministry of Works and Government House Junction to the foot of the hill near Alheri Bread Junction had been largely felled down as a result of the rerouting, reconstruction and dualisation of the road during the Administration of Governor Muhammadu Danjuma Goje (2003-2011). The remnants of the Mahogany trees planted during the colonial period are found close to the Hill; they survive because of the change in the direction of the road away from the former ‘colonial road’ close to the hill, to the south, thereby leaving the remnant trees in the northern side of the dualised road.32

While the development of road infrastructure help to open up hitherto crowded and inaccessible residential areas and facilitate the process of the movement of goods and services, the road construction process affected the environment at different levels.33 Firstly, considerable bushy and forested areas and farmlands had been cleared. Secondly, a lot of lateritic sand had been used in the construction of the roads. Thirdly, crushed stones and
concretes had been extracted from the rocky sites around the Metropolis and used in the construction of bridges across streams and culverts, on both sides of the tarred roads.

Agricultural development also affected the vegetation cover around the Metropolis through the process of enlarging and, or creating farmlands, especially in the period after the advent of military rule when 'Green Revolution' and ‘Operation Feed the Nation’ policies were introduced in the 70s and 80s. Given the vigour with which the Military Administration of General Muhammadu Buhari (1983-1985) encouraged people to cultivate different crops in virgin lands, some people were not mindful of clearing even ecologically fragile lands such as that found in certain parts of Gombe. Meanwhile not all lands are suitable for intensive farming because of their ecological makeup and nature. The vegetation cover on ecologically sensitive lands is, from what is obtainable in other climes, not destroyed in order to preserve the ecosystem. In our society, however, desperate farmers had only been concerned about what they could get by over exploiting the land. The success of Gombe farmers from the colonial to the post-colonial period, in the words of Tiffen, depended on their willingness to clear and work from the plentiful bush around. Fresh land had been easily acquired and cleared whenever the soil show signs of infertility resulting from declining output. Consequently the ‘pressure of population has reduced fallow periods to intervals too short to restore soil fertility, while extension of cultivation in the north has reduced the area available to nomadic herdsmen and led to over-grazing and erosion.’

The land had thus been degraded as the vegetation cover, under the watch of corrupt government officials, had been destroyed through firewood collection, among others. Poverty, especially during the peak period of economic crisis in the country also forced many young people to indiscriminately felled trees in order to collect and sale firewood as a means of earning a living. This is particularly the case during the Military Administration of General Sani Abacha (1993-1998), when the remnant of the ‘native’ trees which formed relatively thick vegetation on the Bisije - Liji Hills and other hills around the Metropolis were recklessly destroyed. The ‘native’ trees destroyed included very useful economic trees such as Kurna (Ziziphus spina-christi), Dinya (Vitex doniana), Taura (Detarium senegalense), Kokiya (Strychnos spinosa) and Tsamiyan Biri (Dialium guineense) that bear fruits which were collected and eaten by the people then. Even students were also involved destruction of the vegetation cover around the Metropolis. In those days students were instructed by their
teachers to get thorn trees’ branches for use to fence off gardens/orchards created in primary and secondary schools in Gombe. They obtained such thorny materials from the bushy and hilly areas around the Metropolis. Today, not only that the vegetation and tree cover on and around the hills were chopped down, parts of the hills had been occupied as people built residential, commercial and religious worshipping centres on them.

The destruction of the vegetation cover for farming, among other purposes, makes the land barren and the soils erodible. From the colonial days, the use of ox-drawn plough to cultivate the ‘fertile vertisols soil (the so-called black cotton soil) not easily worked with by hoe’40affected the soils as the large scale and intensive production of crops using ploughs had a negative impact on the environment. The making of ridges (furrows) with the plough seriously affected the soil structure and led to soil and sheet erosions as the plough was even used in less-compacted sandy soil. The over-cultivation of the soils makes them become increasingly less fertile, fragile and susceptible to erosion by wind, rain water and floods. The secondary impact of soil and sheet erosion eventually led to gully erosion as the cracks or streams formed on the soil expands or widen year by year to become gully. Gully erosion eats up useful lands around the Metropolis as they enlarge. Today, soil, sheet and gully erosions are a common feature of the environment.

As the vegetation cover around the Metropolis was destroyed and the trees cut down along the new constructed roads have no replacement, the urbanites become vulnerable to sandstorm, windstorm and floods. Sandstorm and windstorm have become more and more frequent and severe, especially during the rainy season when windstorm periodically blow of roofs, destroy residential and public buildings, among other havoc which they wrecked on the urbanites, who, as a result of uncontrolled urban expansion that eat up productive land on a considerable scale, the constructed houses on waterways through sand filling of pools, earth dams and streams without creating a proper drainage system.

Unplanned urban development led to construction of residences in the way and manner the residence owner wishes, resulting in the development of crowded residential areas, which have been prone to urban inferno. The crowded nature of some of the residential areas makes it difficult for fire fighters use their Fire Brigade Vanto get into the areas and put out the fire when such incidence occurs. In the crowded and unplanned residential areas in the Metropolis, people dump refuse carelessly often on waterways which not only has serious environmental and health concerns, but also great implications, especially during the rainy
season when it caused flash floods. One of the most devastating floods occurred in 2003 after a heavy rainfall which lasted for over four hours in the Metropolis. A study by a group of geographers makes it clear that:

One of the most important factors considered to be responsible... is the clearance of formerly extended dry forest formations... the scattered trees of the park-savanna vegetation type have only a minor protective effort, so that the impact of heavy rains reaching the soil surface remains undampened. Consequently the centre of the town is affected by flash floods events and strong gully erosion, too that developed on the farmlands in the surrounding area. Hence, the risk of hazards in mainly caused by intensified land use under fragile environmental conditions (e.g. relief, high erodibility of soil and precipitation characteristics).41

The building of houses on waterways and the disposal of residential wastes on the waterways coupled with lack of good drainage system caused the massive flood that not only destroyed many buildings and bridges, injured and killed many people and animals, but also pulled down several electric poles that supplied electricity to the residents of the Metropolis. The fact that Gombe is located within a valley-shaped landscape, the nature of the topographical slop makes rain water moves with high velocity from the western raised-ground to the eastern low-lying ground and washes away the sandy soil easily. Rain water often caused the drifting of sand from the high-to-low lying parts of the Metropolis. The drifted sand often filled or blocked some of existing drainage system, resulting in periodic flash floods of different magnitude which hit Gombe. The scale and frequency of floods affecting the Metropolis has considerably reduced with the recent effort made by the Administration of Governor Ibrahim Dankwanbo (2011 to date) to construct networks of road with good culverts and drainage system in the residential areas located in the western parts of the Metropolis from where soil erosion and sand drift influenced by rain water occasionally caused flooding in the Metropolis.

Unrestricted extraction of earth/sand, clay and rock from different sites in the area for building and industrial uses also facilitate the process of environmental degradation in and around the Metropolis. The massive extraction of red-coloured sand close to the Cemetery
along Gombe-Bajoga Road, and the scooping of clay in among other sites, particularly at place near present day Federal College of Education Demonstration School, along Gombe-Dukku Road not only tempered with the soil structure and makes the land susceptible to erosion, but also accelerated the process of the creation of shafts, gorges and gullies in the respective areas. The silty clay extracted had been used to make earthen-ware for household use. Earth/mud had also been mined at different places and used for building purposes.

The mining and quarrying of rocks around the Bisije Hill led to destruction of the environment. Amey Road Construction (ARC) Company (which was given the contract for the reconstruction of the Sabon Line - BCGA Road in the 70s) was the first company to start mining activities in the area. The process of mining involved the use of dynamite to blast the rock while rock crusher machines and individual manual crushers break the rock into pieces to be used for construction purposes. The activities of many companies involved in the blasting of the rock and quarrying in the area had negative environmental impact. The loud sound produced by dynamites and the power of the blast not only creates noise pollution, but also shakes buildings nearby resulting in making building crack in residential areas close to the area of the mining and quarrying activities.

The blasting of the rocks through mining activity coupled with the destruction of the vegetation cover affected wildlife habitats around the Bisije - Liji Hills, thereby forcing them to move to safer places elsewhere. Tiffen reported that by mid-1960s most game animals had either retreated from the closely farmed areas of Gombe or had been killed such that farmers were no more concerned with the issue of the wild animals destroying their farm produce. Thus, the activities of farmers and hunters as well as urban expansion further accelerated the process of wildlife extermination at a time when Gombe State Government is yet to come up with a law that protects wild animals. Only the Bauchi State Wild Animals Edict of 1984 promulgated under the Military Administration of Colonel Sani Sami (1984-1986) is being used as a guiding document. Considering the fact that Gombe was part of the defunct Bauchi State, the law is supposed to be domesticated even if a new one has not been formulated for Gombe State. The law is more or less considered as obsolete. Hence people kill the wildlife at will, with no effective law to check their excesses. While some of the wild animals had been hunted, captured and eaten as ‘bush meat’, local physicians, herbalists and hunters and also use certain parts of the wildlife and plants for medicinal and household uses, just as newly delivered women use trees’ leaves for steaming. Local health care service
providers had been patronised by people in spite of the dominance of the modern health system in our society as Abubakar has rightly observed that ‘the traditional system of health and medical care survived the onslaught of the modern system and exist side-by-side with it. This is largely because of its efficacy and deep rooted origin in the people’s culture, notwithstanding its problems and limitations.’48

The problem of waste disposal and garbage accumulation has been an environmental issue in the Metropolis. From the colonial period through the 1970s household and township sanitation was observed through the activities of Sanitary Inspectors.49 The military regime in Nigeria introduced environmental sanitation programme whereby every month’s last Saturday general sanitation was observed. But as years rolled by, the disposal of waste on waterways and drainage system; urinating and defecating in open places; and lack of proper observance of hygiene in day-to-day household activities and foodstuff selling centres became environmental issues with serious health concerns as Waziri reported the situation in a generalised manner as follows:

Environmental sanitation was not also given due attention. It is evidently clear to any visitor to the State Capital and many of the towns in the State that this vital aspect of health care is not given attention. All streets are littered with all sorts of refuse and waste, gutters are blocked and sticking. The smell of human waste hits one in many places. Food in the markets and elsewhere are displayed or prepared under unhygienic conditions.50

High rate of consumption of goods and services in the Metropolis create all kinds of wastes and waste disposal problems in the urban environment. Residential wastes had been mostly dumped in undesignated places and on waterways resulting in garbage accumulation in and around the Metropolis. Household wastes cause bad odours, supports rats, flies and other vermin, thereby affecting the surrounding area. Open gutters are found in Jekadafari, Bolari and new built up areas that have no proper layouts. People in crowded shelters without good toilet facilities defecate in poly bags and throw it carelessly on the streets and, or waterways. Some people defecate at night along foot paths and urinate in broad day light in open places, thereby making the places stink. Some defecate on or close to the sites where
toxic wastes are dumped. Hazardous chemical wastes (reagents) had also been improper disposed and, or poured carelessly on the ground or on waterways.

Some people in the Metropolis had been involved in the habit of dumping of animal carcass in open places and in refuse dumping sites. The wastes and rotten carcass not only attracts vectors, but also creates bad odours and air pollution. Bad smell often affects the people passing-by the dumping sites. Certain people locally called Komi Nama (people that eat any kind of animal, dead or alive) not minding the health implication of their actions moved from one dump site (kwari) to another looking for carcass or buy them from people; they even roasted and packaged the carcass for export to Southern Nigeria. This was done at a recognised building locally known as Gidan Komai Nama located in Sabon Line; the whole area where the building was located stinks, thereby polluting the air around the place.

Besides the air and noise pollution caused by the blasting of rocks and quarry activities around the Bisije - Liji Hills, grinding machines and rice processing mills, vehicles and motorcycle mechanics also create unnecessary noise that discomfort people in their neighbourhood. The gases emitted daily by vehicles, motorcars and motorcycles, generating sets and industrial and households through cooking and production process pollute the air of the surrounding environment. It is difficult to estimate the amount of polluted gasses emitted daily from within the Metropolis, but one can easily observe the amount of gasses produced in area by standing at the raised ground of Old or New Mile 3 and viewing the sprawling urban settlement of Gombe in the low-lying landscape.

The emitted gasses, it has been observed, usually and literally forms a massive cloud over and above the Metropolis. The gases had been inhale on a daily basis by the urbanites and have direct and indirect harmful effect on the peoples’ health. More so as much of the vegetation and trees known for their absorption of excess carbon dioxide (co2) and polluted gasses such as nitrogen oxide, ammonia, sulphur dioxide produced by industrial and urban based activities, had been mindlessly destroyed. The trees filter the particles out of the air by trapping them on their leaves and barks, store them and in their place release oxygen into the atmosphere, thereby cooling the local climate by reducing heat through realising water vapour into the air. They moderate atmospheric moisture and release fresh air which is good for humans and animals. If the concentration of tree cover in and around the Metropolis were great it would have reduced the harmful effect of the polluted gasses on the urbanites.
Migration Measures

Over the years efforts had been made by Government, Non-Governmental Organisations (NGOs), private individuals and communities to mitigate the scale of environmental degradation with relative success in and around the Metropolis. From the 1960s through the 1980s conscious efforts had been made to half environmental degradation through deforestation. Government encouraged local rulers and governmental officials, particularly staff in the Forestry Department to protect the surviving ‘native’ trees and to plant new ones in order to protect the environment from desert encroachment. Government agencies and individuals planted woodlots and shelterbelts as people had been educated on the danger of environmental degradation, particularly desertification which had been steadily moving southwards. The planting of trees along the roads and streets and in front, inside and in the backyard of private compounds and government buildings had been emphasised.

Furthermore, wood lot plantations mostly of Neem trees had been created in and around the Metropolis have become Eid Ground, where Annual Sallah Prayer had been observed like the Gombe Main Eid (Idi) Ground near Gombe Main Market planted in 1976; the one along Gombe-Dukku Road near the Grain Silos planted during the Administration of Alhaji Dahiru Deba, then Governor of Bauchi State (1991-1993) and the Izala Eid Ground at Tumfure, along Bauchi Road. Woodlots had also been planted at the Friday Mosques at the Emir’s Palace, New Commercial Area, and Bolari, among other places in the Metropolis.

There has been a renewed determination by the Federal Government to check the high rate of desert encroachment in Northern Nigeria after the coming of democratic dispensation in 1999. A blueprint of the strategic plan to combat desertification through the planting of Green Wall along the ‘Border States’ and the planting of green belts in strategic places within the States is titled as National Strategic Action Plan for the Implementation of the Green Wall for the Sahara and Sahel Initiative. Gombe State is described as one of the desertification prone frontline states. In Gombe, the President of Nigeria, Chief Olusegun Obasanjo (1999-2003) himself launched the tree planting programme. He, among others, planted Eucalyptus Plantation in Nasarawo in the Metropolis. Communities, private individuals and NGOs continued to plant trees as the need arise, thereby protecting the environment from degradation. By far the establishment of Gombe State University in 2004 and its involvement through the Mahadi Foundation in community service has revolutionised tree planting.
campaign in Gombe State. The University Campus has been the experimental field where Kanya, Dabina, Kurna, Mango and Coconut Plantations and Mahogany Shelterbelts had been planted with excellent result. The Foundation has been involved in tree planting programme in public and private schools in the Metropolis and other places in the State and elsewhere in Nigeria.55

On the issue of sanitation and waste disposal, from the days of the military regime, sweeping of main roads and streets and private compounds every last Saturday of the month was emphasized. Waste collection sites were constructed in wards and residential areas where people dump their refuse. The policy of sweeping every last Saturday of the month was considered against democratic principles and look more or less military oriented style of governing the citizenry and was therefore stopped by the Obasanjo Administration in 1999 and no substitute policy was introduced immediately. As a result, the people went to sleep concerning regular sanitation within the Metropolis. It was the introduction of Gombe State Environmental Protection Agency (GOSEPA) by the Administration of Governor Goje (2003-2011) that brought some level of environmental sanitation back to the roads and streets in the Metropolis. Emphasized was placed on clearing of heaps of garbage accumulated in a number of places, removal of rubbish/waste and, or sand that filled culverts along the roads and sweeping of the main roads in the Metropolis, un-tarred streets in residential areas were not given so much attention. The GOSEPA driven urban sanitation programme was not all inclusive, but was maintained even by Dankwambo Administration (2011 to date). He also employed the services of INEX Cleaners, a private company to ensure proper urban sanitation, with special attention still given to the main roads and streets with asphalt pavements. The INEX Cleaners employed men and women to sweep the streets, and also have Waste Collection Trucks and Waste Bins where heaps of garbage dumped by the people had been routinely evacuated to improve environmental sanitary.

Efforts were also made to control soil and gully erosion in and around the Metropolis through the construction of drainage system in areas affected by gullies. In view of the fact that the formation of cracks on the land as a result of sheet erosion and rain water runoff and widening of streams on the land cleared of vegetation cover and destruction of rich agricultural lands led to soil and gully erosions, two commendable efforts at controlling the ecological problems were made in the 1960s and 1970s when a soil conservation programme was embarked upon at Checheniya and the deep gullies in that run through the Town were
narrowed through the use of hard wire packed with rock particles and mounted on the edges of the gullies. Under the current democratic dispensation Government made some level of commitment in recent years to check the spectre of gully erosion in the Metropolis. Through the use of Ecological Fund and the Nigeria Erosion and Watershed Management Agency Project (NEWMAP) some raging gullies in the Metropolis had also been controlled or narrowed using concrete walls on both sides of the gullies.

Furthermore, between 2009 and 2017 the construction of a network of roads with good drainage system in the residential areas of Federal Low-Cost, Checheniya, Buba-Shongo, Shongo and Orji Housing Estates, New GRA among other places has help tremendously to reduce sand drift and control soil erosion caused by rain water run-off. Besides Government efforts, communities, individuals and NGOs had also been involved in erosion control through planting a shrubbery plant commonly call Kashe Kwari (otherwise known locally as Kafi Kansila) inside and, or on the edges of the gullies and water run-off sites. This has proven to be an effective means of controlling gully erosion. The people also use sacks filled with sand and gravels to block areas of water runoff, thereby controlling sheet erosion in the affected areas within the Metropolis.

The construction of a network of access road sin the densely populated areas has also help to open up hitherto crowded residential areas in the Metropolis. This is particularly the case in Jekadafari, among other residential areas in the Metropolis. The INEX Cleaners and the sanitary personnel of GOSEPA now often clean the ‘access roads’ constructed in the residential areas, thereby ensuring proper sanitation. It has also open up the areas for commercial and economic activities taking place in the Metropolis as many shops and stores have been opened along the roads in the residential areas.

**Conclusion**

The paper discussed the relationship between urban development and environmental degradation in and around Gombe Metropolis. It has been argued that following the establishment of Gombe Town in1919, growing human activities accelerated an on-going process of environmental change as the admirable flora and fauna, the rich biodiversity of yesteryears in the area had been largely depleted and the land progressively degraded, especially in the period after the making of Gombe the Capital of Gombe State in 1996. In the process of urban expansion and residential, commercial, institutional, infrastructural and agricultural development the environment became degraded as evidenced in the building of...
houses on waterways; lack of proper layouts in some residential areas; the existence of open gutters; the dumping of refuse on waterways; the blasting and mining of rocks; urinating and defecating in open places; improper handling of solid and hazardous wastes which raised serious health and environmental concerns. The Government, NGOs, communities and private individuals had been working to address certain aspects of environmental degradation with relative success. However much is required to be done in order to effectively stop environmental degradation induced by urban development in the Metropolis.
Reference


5. Akin L. Mabogunje, Urbanisation in Nigeria, University of London Press, 1968, p. 36