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Chapter

Understanding the Challenges of 21st Century Urbanization in Northern Nigeria's Largest City, Kano

*Auwalu Faisal Koko, Muhammed Bello
and Muhammad Abubakar Sadiq*

Abstract

Kano, the largest city in Northern Nigeria, has experienced tremendous and unprecedented urban growth since the late 10th Century, following the emergence of the city as one of the oldest and most prominent urban centers for Trans-Saharan trade that linked Sub-Saharan Africa with North Africa, Northern Arab, and other European countries. The city's rapid urbanization is mainly attributed to the influx of people as a result of socio-economic trading activities. However, the inability of relevant government authorities to actively respond to the city's rapid urbanization, coupled with the demographical and spatial expansion, has contributed to the enormous contemporary challenges. Therefore, the present study examined the various challenges faced due to the tremendous urbanization in Kano city, Nigeria. The study identified the city's challenges to include infrastructure decay, environmental pollution, problem of urban mobility and traffic congestion, unemployment, and increased crime rates. It also analyzed the implementation of several strategies and initiatives of the relevant government authorities in tackling these problems while carefully recommending further solutions aimed at addressing these contemporary challenges. This is with a view of having a cosmopolitan city that continuously attracts the inflow of populace due to its socio-economic status without jeopardizing the city's sustainable growth.

Keywords: urban growth, urbanization, sustainable development, population growth, rural–urban migration, trans-Saharan trade

1. Introduction

Cities around the world are experiencing rapid and unprecedented population growth, especially in developed and developing countries of the 20th Century [1–5]. Global estimates indicate that the population of urban areas has increased from a previous 13% in 1900 to 30% in 1950. This figure further rose to 55% in 2018, and it is projected that by 2050, 68% of the global population will live in cities [3].

This reflects an astronomical growth in the urban population from about 751 million in 1950 to approximately 4.2 billion in 2018. The pattern and trend of urban growth in Sub-Saharan African countries such as Nigeria, Africa's most populous country, have been relatively tremendous [6, 7]. Prominent cities such as Lagos, Abuja, Kaduna, and Kano are developing and experiencing a rapid increase in population, with a consistent urban growth rate above 2% per annum [3]. Hence, becoming more urbanized with rapid population growth [4, 5, 8–10].

Kano, one of Nigeria's largest cities with an urban growth rate of between 2 to 2.5%, has witnessed rapid and continuous population growth over the years. Its population increased from 9,383,682 million in 2006 to an estimated 15 million inhabitants [11]. Thus, becoming a city with the highest population in Nigeria's Northern region and the second-largest in the country. The city and its metropolis have also witnessed spatial growth and expansion. The area of the city has increased from an estimated 122.7 km² in 1962 to approximately 154.6 km² in 1981 [12]. This suggests an average expansion of about 25% (i.e., 2km²) per annum. The city further witnessed rapid growth and expanded to about 196.4 km² in 1986, 337.9 km² in 2005, and was projected to have covered 499 km² in 2015 [13]. The rapid population growth and spatial expansion of Kano are mainly due to various factors that include the historical, cultural, environmental, and socio-economic development of the city. Similarly, in-migration and trans-Saharan trade that brought the influx of people to the city has also contributed to the high population of the city [14, 15]. This has led to various consequences, some of which include; deterioration of urban infrastructures and facilities, environmental pollution [16–19], inaccessibility to urban facilities and services [16, 19], inadequate and dilapidated housing [18, 20, 21], lack of potable water, flooding as well as unemployment, poverty and increased crime rates [22]. Presently, very few comprehensive studies exist on the dynamics of urban growth in the ancient city of Kano, which is the largest city in Northern Nigeria and the second largest in Nigeria. Therefore, it is of utmost importance to critically examine the challenges of urbanization and urban growth in Kano with a focus on recent government strategies and initiatives to address these challenges.

The key objectives of this article are to:

- i. To study the geographical location, population, and demographical character of Kano.
- ii. To examine the historical and urban development of Kano with a view of comprehensively understanding the context in which the contemporary challenges of the city exist.
- iii. To deliberate on the key challenges confronting the city of Kano and critically examine the various policies and measures of the government aimed at curbing these challenges.
- iv. To offer some suggestions on ways of addressing these contemporary challenges.

2. Location and physical characteristics of Kano

Kano is located between latitudes 10° 30' to 12° 38' North and longitudes 7° 45' to 9° 29' east [23] and has an altitude of approximately 484 meters (about 1588 feet) above sea level. Kano covers approximately 20,131 square kilometers of landmass,

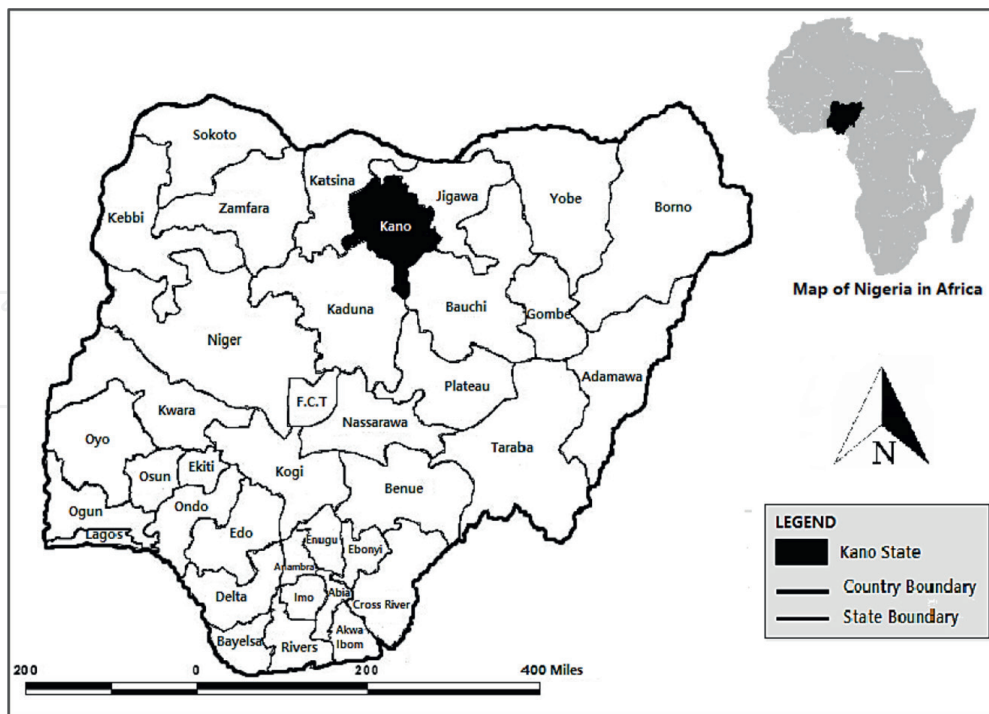


Figure 1.
Location of Kano in the northern region of Nigeria.

consisting of approximately 1,754,200 hectares of agricultural land, over 92,250,81 hectares of grazing, and forest vegetation [24]. The city is situated centrally in Nigeria's Northern region (**Figure 1**), about 900 kilometers from the edge of the Sahara desert, and approximately 1140 kilometers away from the Atlantic Ocean within the Sudano-Sahelian Ecological Zone (SSEZ) of Nigeria [25]. It is bordered to its North by the Niger Republic, to its South-west by Kaduna State, to its west by Katsina State, and to its east by Jigawa State and Bauchi State. Based on Koppen's climatic classification established over a century ago, Kano is characterized by a wet and dry climate, usually referred to as Tropical wet and dry savannah and coded as Aw. The seasonal changes of Kano occur between the wet and dry tropical air masses, also known as the Inter-Tropical Discontinuity (ITD), resulting in two distinctive seasons referred to as the wet and dry seasons [26].

Kano's climatic features depict those of the West African savannah region, with the wet season usually beginning in June and ending in September and the dry season beginning in October and ending in May of the subsequent year. Rainfall data collected from the International Crop Research Institutes of the Semi-Arid Tropical Regions (ICRISAT) shows that the Mean annual rainfall of Kano ranges from a little below 800 mm in the city's extreme North to over 1000 mm in the city's extreme south. Latitudinal and continental factors determine the amount of rainfall in the city, which usually lasts for three to five months. The mean temperature of Kano ranges between 26–33°C, with the city having three seasonal types based on its temperature. The first is the cold and dry season, which is usually experienced between November and March. During this period, Harmattan winds usually prevail, with the city having a mean monthly temperature ranging between 21–23°C and a diurnal range of 12–14°C. Subsequently, the dry and hot season is experienced from March to May. During this period, the mean monthly temperature usually exceeds 30°C, with a daily range of about 20°C. The third season which is the wet season is generally warm.

It has a mean monthly temperature of 26°C and a diurnal range of about 10–13°C in September [27]. Kano's vegetation can be classified as Sahel, Sudan, or Guinea savannah due to its natural surroundings and human activities [28]. The city has dry guinea vegetation in its southern parts, while other parts of the city have the Sahel and Sudan vegetation. The fertile agricultural land of Kano supports numerous food and cash crops that include groundnuts, wheat, rice, millet, sorghum, cowpeas, and vegetables.

As a result, Kano is one of the most prominent agricultural centers in Nigeria as well as a principal commercial and industrial city in Northern Nigeria and has continuously attracted much populace to the city. The city is connected by road, rail, and air to all parts of Nigeria and other countries.

3. Population and demography of Kano

The population of Kano has rapidly increased over the years due to the historical function of the city and its cultural development as an ancient city in the defunct former Hausa States of Nigeria. It is a cosmopolitan city that has attracted much populace from Europe, North Africa, and other sub-Saharan countries since the early days of the famous Trans-Sahara trade between the 16th and 19th centuries. Kano is among the most densely populated city in Nigeria and Sub-Saharan Africa [29]. The city has witnessed rapid expansion and growth both in terms of land use and population. According to the National Population Commission, the population census of 1991 and 2006 put the estimated population of Kano to be approximately 5,810,470 and 9,383,682, respectively. Studies conducted by Ibrahim (2014) indicated the gender distribution of the population to consist of 2,958,736 males and 2,851,734 females in 1991, while, in 2006, the population composition further rose to 4,844,128 males and 4,539,554 females. Similarly, Bichi, Abdu, Umar and Tukur [21] opine that the city's metropolis accounted for over 1,432,255 and 2,165,223 of the state's inhabitants in 1991 and 2006, respectively, representing over 23% of the total population in Kano.

The urban population of Kano has increased from a previous 131,000 in 1952 during the colonial government to about 250,000 populace in 1963, as observed by the population census of the Nigerian government [29]. This figure has further increased to approximately 2 million, 2.6 million, and 3.2 million populace in 1990, 2000, and 2010 respectively, as seen in **Table 1** [3]. This indicates an annual growth rate of between 2 to 2.5% in the city's metropolis. In another study, however, conducted by Potts (2012), to critically examine the growth and development of Nigeria's cities. It observed Africapolis [31] re-evaluation of Nigeria's urban population based on the census data and estimated the population of Kano city to be around 459,000 in 1960. It also reported the population of Kano to be 882,000 in 1970, 1,448,000 in 1990,

Year	Population	Population Growth	Growth Rate (%)
1990	2,095,384	234,760	2.40
2000	2,602,434	263,274	2.16
2010	3,220,929	325,759	2.16
2020	3,999,050	415,708	2.38

Source: *World Urbanization Prospects* [30].

Table 1.
Urban agglomeration of Kano.

1,855,000 in 2000, and 2,262,000 in 2010. This observation indicates an inconsistency in Kano city's population. However, what remains unquestionable is that the city has undergone tremendous growth over the years, regardless of which population estimate is considered acceptable.

The urban agglomeration of Kano, alongside its suburban areas, covers a radius of 60 square kilometers and a built-up area of 48 square kilometers. Kano metropolis is estimated to have approximately 3,999,050 inhabitants in 8 Local government areas of Kano Municipal, Tarauni, Fagge, Kumbotso, Dala, Nassarawa, Gwale, and Ungogo. Kano currently has an estimated total population of over 12,000,000 inhabitants [21, 27] and a high population density of over 550 inhabitants per square kilometers within the city's closed settlement zone as compared to Nigeria's average population density of 215 inhabitants per square kilometers [32]. Various studies attribute the high population of Kano to various factors that include but are not limited to historical, cultural, environmental, economic, and political developments.

4. Historical development of Kano

The historical development of Kano dates back more than 1000 years (i.e., the late 10th Century). During this period, Kano became one of the oldest and most prominent centers for the Trans-Saharan trade that involved the transportation of goods between sub-Saharan Africa, Northern Arab, and other European countries [29]. Kano is an agricultural state, the largest city in Nigeria's Northern region, and Nigeria's second (2nd) largest industrial city. It has over 18,684 square kilometers of cultivable land, with one of Nigeria's most extensively irrigated lands. The city of Kano is a primary producer of groundnut in Nigeria, contributing significantly to the country being the largest producer in Africa, contributing over 30% of Africa's total groundnut production and the third (3rd) globally after China and India [33].

The formation of settlement began to evolve in Kano as early as the first (1st) century AD when the people of the region engaged and became famous in iron mining and smelting activities. This led to the creation and growth of local chiefdoms and the subsequent establishment of the first kingdom in 999. The creation of Kano manifested towards the late 10th Century with the construction of the city walls during the 11th and 12th Centuries (i.e., from 1095 to 1134 AD) after the area became one of the seven Hausa kingdoms created by the descendants of Bayajidda, which prospered for about 500 years before the 19th Century [34]. The city walls of Kano are magnificent monuments built during the reign of the third king of Kano, Sarki Usman Giji Masu, and cover an area of approximately 19.2 square kilometers [20]. The walls have a height of about 9–10 meters and a similar dimensional thickness at the base, with a reduction of approximately 3 meters at the top as shown in **Figure 2** [35, 36]. They were built mainly for defense purposes using mud bricks and plastered with successive layers of earth material [37]. The city walls were constructed in the mid-13th Century during King Zamnagawa's reign, with the walls covering the entire city, having a total of 15 gates used to control people's movement in and out of the city [38]. The city walls of Kano are considered beyond monolithic structures and stretch to the archeological site of Dala Hill, the Emir's (King's) Palace, and the famous Kurmi international trade market [39, 40].

The Dala hill (**Figure 3**) is an ancient settlement and a source of Kano city's evolution, which dates back to the early 8th Century AD. The settlement serves as a vital point of reference for the historical development of cultures and societies in



Figure 2.
Ancient Kano city wall.



Figure 3.
View of Kano from Dala hill.

Hausaland (Urquhart, 1977). It also influenced the early local civilizations in the Western African sub-region savannah zone. The Emir's (King's) Palace (**Figure 4**) within the Kano city walls was built in the late 15th Century during the reign of King Muhammadu Rumfa between 1473 to 1482 [25]. It covered an area of approximately 33 acres of land. The palace is surrounded by 6–9 meter high walls from outside and 3-meter walls within the compound (Archnet, 2010). The Emir's Palace forebears the cultural and historical heritage of Kano city (**Figure 5**). It has a mixture of traditional, historical, and modern architectural features that reflect the cultural identity of the Kano people. It was planned to have a museum for historical artifacts and an open



Figure 4.
Aerial view of Emir's palace.



Figure 5.
Main entrance to Emir's palace.

arena for Durbar festivals. The palace has three access routes: Kofar Kudu, Kofar Kwaru, and Kofar Fatalawa. The Kurmi Market in Kano is a well-known international trade market and one of the oldest local markets in Sub-Saharan Africa [41–43]. The market was created by King Muhammed Rumfa, the then King of Kano City, in the 15th century AD in 1463. It is recognized as one of the largest markets in Africa, covering an area of more than sixteen (16) hectares of land with over a thousand (1000) market shops. The market shops were arranged in lanes, with each lane consisting of different traders of iron and brass work, Gold and Silverworks, traditional hand-woven fabrics, African handicrafts, figurines, and many more [42, 44]. The location of the market in the heart of Kano, within a slight distance from the city's central mosque and the Emir's Palace, gave a sense of bond and proximately between the people and the kings [44]. Hence, considered the city's central place of unity.

Between the 18th and 19th centuries, Kano became the largest and most prosperous province under the Sokoto Caliphate after the inception of Usman Dan Fodio's Islamic reforms in West Africa's Savannah region [25]. The region was colonized and made the administrative center of Northern Nigeria by the British in 1903 and was later replaced by Zungeru and Kaduna. Kano regained its administrative prominence after Nigeria's independence in 1960 and was established as a Nigerian state from then Northern Nigeria in 1967 [45]. Traders from Borno, Chad, and those from the western regions of Africa regularly visit the state. Kano serves as a meeting point for cultural and commodities exchange between the Arabs of Northern Africa and the Hausas of Sub-Saharan Africa [46, 47]. This has made the city an important commercial and



Figure 6.
Dye pits and traditional dyeing activities in Kofar Mata, Kano.

industrial hub that serves as an entrepot for ancient international trade in the 18th and 19th centuries [48, 49]. Other Trading activities in the city include the dyeing of textile materials (**Figure 6**), cotton production, local crafts, and leather goods [50, 51].

Kano, Nigeria's second-largest industrial city after Lagos, has the highest number of industries in Northern Nigeria. These industries include metal fabrication, plastic, leather, textile, fertilizer, food and beverages, oil, and many other agro-based industries. By its historic function, the city of Kano is one of the most culturally, economically viable, and politically coherent city-states in Hausaland [52]. The city's central location also makes it a critical terminus for all states in Northern Nigeria, linked by various transportation means to other urban centers in Nigeria. The city remains a living, contemporary relic of a rich past.

5. Urban planning and growth of Kano

The planning and development of the ancient city of Kano began as early as the 10th Century with the gradual influx of trans-Saharan traders and the British colonist into the city. The first settlement dated back more than 1000 years ago and was situated around the vicinity of the famous Dala hill, with inhabitants engaging in Iron ore smelting and fabrication [53]. Dankani [19] opined that the spatial planning and growth of Kano started with the construction of the ancient city walls of Kano, which served as a symbol of identity and defense. This construction commenced in 1095 around the Kurmi market and was completed in 1134 towards the Jakara stream of the city. The ancient city walls comprised of the city's central hub, which includes the Emir's palace (**Figure 4**), the famous Kurmi market (**Figure 7**), and Kano city's central mosque (**Figure 8**). It significantly influenced the pattern of settlements and the expansion of early settlements in Kano.

The expansion of the early settlements in Kano began in 1903 after the military conquest with the establishment of the British colonial administration. This led to the city's subsequent growth as the administrative hub of Northern Nigeria and facilitated the development of colonial and post-colonial settlements in Kano. Sabon Gari is a typical example of such a settlement, created in 1913 to accommodate skilled workers migrating to the ancient city of Kano from Southern Nigeria. The growth of this settlement contributed to the early urban planning and spatial organization in the ancient city of Kano from 1915 to 1923. Hence, the old city of



Figure 7.
Local customs in Kurmi market.



Figure 8.
Kano city's central mosque.

Kano and Fagge was recognized as the traditional native areas; Sabon Gari was labeled as the African non-indigene area; Fagge-Ta-kudu classified as the Arabian natives' area, while Bompai, Nassarawa GRA and the railway areas alongside its environs considered as the European areas [54]. Furthermore, this growth also led to the implementation of the first spatial layout of Kano in 1927 with a settlement named Gwammaja, created in 1932, to serve as an experimental settlement for the city's in-migrants. This settlement was further developed in 1940 and provided shelter for the West African Frontier Force veterans and other unskilled Hausa in-migrants [55]. The experimental Gwammaja settlement was later in 1953 integrated into the urban core of Kano as a cohabited settlement for Hausa in-migrants and the people of Southern Nigeria.

Kano has continuously witnessed rapid growth and expansion since Nigeria's Independence in 1960. This unprecedented growth resulted in the then-regional government of Northern Nigeria establishing the Greater Kano Planning Authority in 1962 with the primary purpose of the physical development of the Kano metropolis based on Nigeria's 1946 Town and Country Planning Ordinance [56]. The Greater Kano Planning Authority was later renamed Metropolitan Kano Planning and Development Board in 1969 and subsequently Kano State Urban Development Board (KSUDB) in 1976. Similarly, KSUDB was restructured and transformed into Kano State Environmental Planning and Protection Agency (KASEPPA) under Edict No.15 of 1990 as a result of Nigeria's Government directives on the authoritative need to create Environmental Protection Agency in all the states of the Federation [57]. This agency was further renamed Kano State Urban Planning and Development Board and saddled with the sole responsibility of ensuring Kano's sustainable growth and orderly development. However, despite the transformation of these various planning agencies and bodies, the city of Kano is still faced with numerous challenges due to the city's urban growth, which continuously degrades the city's urban fabric. These challenges result from the continuous influx of people to the city due to the socio-economic activities in Kano, which is closely related to the city's historical function as a leading commercial and industrial hub in Nigeria. This has subsequently led to the rapid growth and development of Kano, with the consequences of this resulting in various contemporary challenges. Some of these challenges include urban sprawl, inadequate housing, services, and facilities, environmental pollution, decay in physical and social infrastructures, traffic and human congestion, inadequate employment opportunities, an increase in rates of crimes, and other social vices.

6. Kano's contemporary challenges and recent initiatives

6.1 Decay in infrastructures due to urban sprawl

Over the years, Kano has witnessed unprecedented and unplanned urban development due to the city's urban growth, which has resulted in the urban fabric's spatial growth and rapid expansion. This growth, coupled with the rapid increase in the city's population due to various socio-economic activities resulting from the massive influx of migrants pursuing trading commodities and other opportunities such as employment, agriculture, and education, has exerted much pressure on existing public infrastructures in Kano. Therefore, resulting in the decay of physical and social infrastructures, the consequences of this manifested in various forms of peri-urban, slums, and squatters settlements with inadequate necessary facilities and services. Similarly, urbanization has significantly influenced the land use pattern and distribution in Kano, especially towards the city's fringes with numerous impacts on agricultural lands [58]. Earlier studies conducted by Dankani and Ibrahim [59] indicate a continuous decline in agricultural lands in Kano and a tremendous increase in residential development from about 28.19 square kilometers in 1966 to approximately 144.5 square kilometers in 2016. This signifies an increase in the built-up area of Kano by about 8.25% annually, which is about 2.3 square kilometers and a subsequent decrease in natural vegetation. In a recent study, Koko et al. [26] indicate that the built-up area of Kano metropolis has increased from 66.16 square kilometers in 1991 to approximately 218.89 square kilometers in 2020, indicating an increase of 26.52% and an urban growth rate of 5 square kilometers per annum. This growth further serves as a threat to agricultural development, food security and contributes significantly to the decline in agricultural income and economic diversification.

Ayila, Oluseyi and Anas [14] attribute the growth and development of Kano to the city being the largest commercial and industrial hub in Northern Nigeria, with the majority of its populace and in-migrants engaging in a large volume of trading activities in various markets in the city. Such markets include the famous Kurmi market, Sabon Gari market, Kantin Kwari market, Dawanau market, and Kwanar Singer market. Kano also has numerous large, medium, and scale industries producing various textile materials, agricultural equipment, tanned leathers, pharmaceutical products, furniture, footwear, ceramics, plastics, and enamelware. Other products manufactured in Kano include animal feeds, dairy products, food and beverages, soft drinks, vegetable oil, and many others.

The urban growth of Kano covers all the eight Local Government Areas within the Kano city walls that include Kano Municipal Council (KMC), Fagge, Dala, Tarauni, Nasarawa, Gwale, Ungogo, and Kumbotso Local Government Areas. Other areas of the metropolis include parts of Dawakin Tofa, Gezawa, Dawakin Kudu, Madobi, and Rimin Gado LGA (**Figure 9**).

The consequences of this spatial growth and expansion of Kano are the undesirable physical and socio-economic problems that continuously serve as a threat to the health and well-being of the city's inhabitants. Such problems include; the haphazard development of residential areas in the city's suburbs without proper approval by relevant government authorities resulting in the physical deterioration of Kano city's infrastructure. Others include the uncoordinated development of Kano city's infrastructures, contributing to traffic congestion and air pollution, as well as inadequate essential facilities and services such as electricity, potable water, educational, and healthcare facilities, among others.

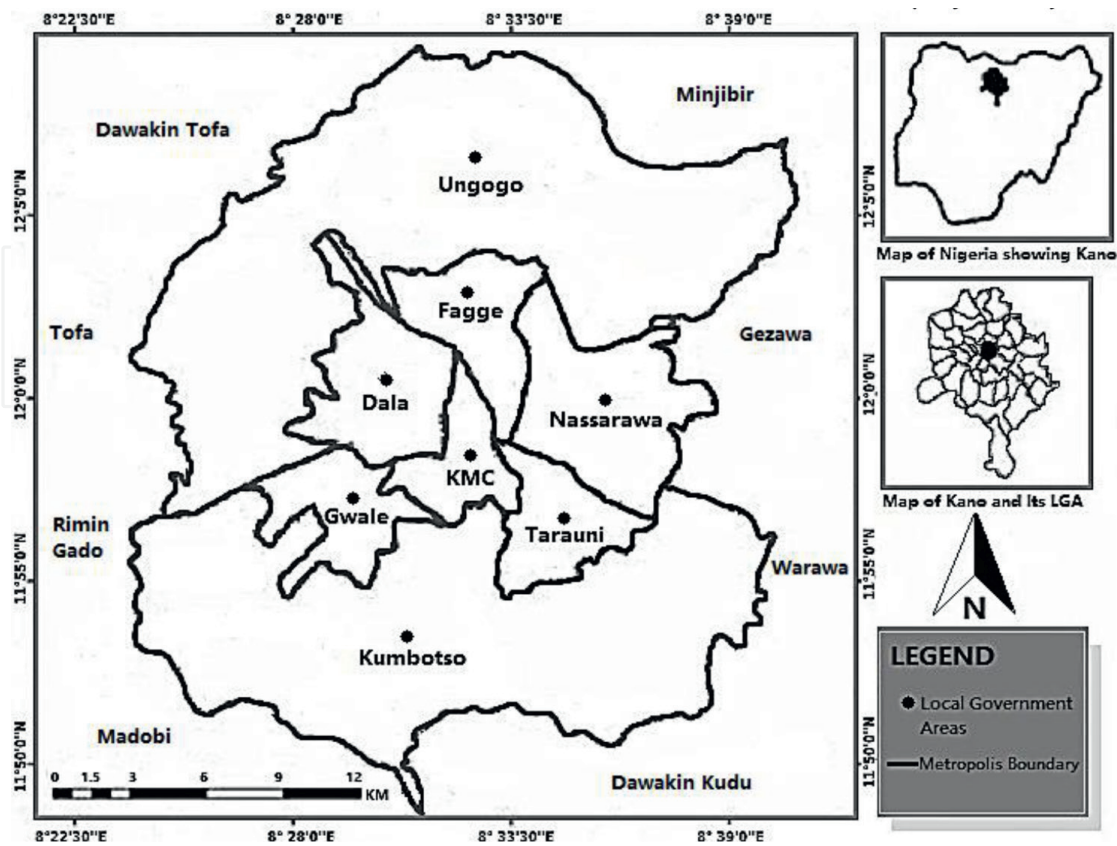


Figure 9.
 Map of Kano Metropolis and its surrounding LGAs.

In response to this challenge of decaying infrastructures due to the consequences of urban sprawl in Kano, the Kano state government initiated urban renewal and rural transformation projects tagged ‘Lungu Kal-Kal’ and ‘Karkara Salamu-Alaikum.’ The two (2) critical projects aimed at addressing the deteriorating infrastructures in the city while beautifying the urban landscape of Kano through the construction and rehabilitation of new and existing roads and bridges, renovation, and construction of educational and healthcare facilities as well as the provision of essential facilities and services to link the industrial city to all the rural communities across the state. The project’s first phase encompasses all eight (8) metropolitan local government areas in Kano, covering Kano municipal, Dala, Tarauni, Fagge, Kumbotso, Nassarawa, Gwale, and Ungogo. The projects executed under the first phase include; the construction and rehabilitation of numerous road infrastructural projects, the construction and provision of Healthcare and educational facilities to all communities of Kano [60].

As a contribution to this response, some of the challenges faced due to the negative impact of urban sprawl can be further eradicated through the active participation and involvement of communities in relevant policy formulation and decision-making. This will go a long way in adopting the principle of “planning with the people” rather than “planning for the people” regarding the physical development that seeks to curb the menace of urban sprawl. There is also a need for more community enlightenment and advocacy regarding the benefits of complying with Kano’s State Urban Planning and Development Authority (KNUPDA) planning laws that enhance and promote sustainable urban growth through infrastructural development.

6.2 Environmental pollution

The rapid increase in Kano city's population due to urbanization and the increase in the city's economic activity as a result of the unprecedented growth has resulted in numerous environmental challenges. This is due to the discharge of residential or domestic waste, commercial, industrial, institutional, and other waste sources into the environment, which manifests into various forms of land, water, and air pollution, causing potential harm to the health and well-being of the city's inhabitants. A study by [61] indicates that approximately 3085 tons of waste are generated daily in Kano metropolis, with only about 36 percent evacuated. This is due to various challenges resulting from inadequate institutional and technical capacity, financial constraints, economic and other social factors due to Kano city's increasing population. A breakdown of the waste generated in Kano city revealed that residential, commercial, industrial, and institutional waste accounts for 62.5%, 26.9%, 2.9%, and 5.9%, respectively, with other sources of waste in the city accounting for 1.9%. [61] also revealed that Kano city is facing the challenge of inefficient waste management practices due to the lack of appropriate landfill and other recycling approaches in the city. This is evident in the city's indiscriminate waste disposal and the growing number of open dumpsites around the city in areas such; Gandun Albasa by Zoo road, Mopol Barracks by Hotoro road, Kasuwan Kwari, Kofar-Ruwa, Gwale, Gyadi-Gyadi by Court road, Bompai, Sabon Gari Market, Sabuwar Gandu, Yan-Kaba, Singer, Dakata, and many other areas (**Figures 10 and 11**). Butu et al. [62] believe that these tonnes of uncollected municipal waste within Kano metropolis are usually washed by rainstorms into drains and open gutters, thereby clogging drainage channels, which subsequently causes water pollution and flooding in the city. Indiscriminate disposal of waste in Kano also creates a breeding ground for bacteria, parasites, rodents, reptiles and other dangerous insects, which have severe health consequences and nuisance to the environment.

Kano is also experiencing increased environmental pollution, especially in the city's water bodies, due to the indiscriminate discharge of industrial effluents from Challawa, Sharada, and Bompai industrial layouts into Challawa River, Salanta River, and Jakara dam, respectively. This has contributed to the drainages in these areas having slush of industrial waste with the air having an offensive odor. A study conducted by IQAir AirVisual [63], pointed out Kano as the most air-polluted city in Africa,



Figure 10.
Waste dump along Kwari market.



Figure 11.
Municipal waste dump.

with an air pollution level of about 54.4 percent. The study revealed that the air in Kano city was 53.4 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) with 2.5 micrometers or less of ultrafine particles. This exceeds five (5) times the maximum limits recommended by the World Health Organization (WHO) and exceeds Nigeria's average $\text{PM}_{2.5}$ concentration of $44.8 \mu\text{g}/\text{m}^3$. Some of the major causes of this high air pollution in Kano include but are not limited to vehicle exhaust emissions, industrial toxic waste, burning of firewood, and kerosene. The consequences are closely related to various health challenges that include heart disease, lung cancer, stroke, and other respiratory infections.

In response to the challenge of environmental pollution due to inadequate and poor waste management practices in Kano metropolis, the Kano state government in 2003 established the Refuse Management and Sanitation Board (REMASAB) and saddled it with the sole responsibility of waste management in Kano metropolis. However, this agency has been confronted by several technical, institutional, economic, and financial challenges [61]. Another challenge that hinders the efficiency and effectiveness of waste management in Kano city is the inaccessibility to most areas of the ancient city and new settlements in the city's fringe due to the centralized nature of REMASAB. As a result, there is a need to decentralize refuse management systems in Kano while providing adequate dumpsites at different areas of the metropolis to address the challenge of inaccessibility due to uncontrolled urbanization. In addition, the active partnership of the private sector and other tiers of the government in managing the waste system through Public-Private Partnerships (PPP) of waste management is necessary. This will help significantly reduce Kano city's growing environmental issues while providing youths with employment through close collaboration between the government and the private sector. In this regard, the Kano state government recently sought and got the intervention of the Federal Government of Nigeria for the construction of a Central Effluent Treatment Plant (CETP) comprising of both primary and secondary treatment in the Challawa and Sharada industrial layouts with a daily capacity 15,000 and 4000 cubic meters of waste respectively. This is in addition to the construction of a similar CETP in Bompai industrial layout with a primary treatment plant only and a daily capacity of 1000 cubic meters of waste. This intervention aims at tackling the hydra-headed challenge of industrial waste pollution confronting Kano as a city. However, the impact of these interventions remains unrealized due to the non-completion of these projects.

6.3 Problem of urban mobility and traffic congestion

The problem of urban mobility in most Nigerian cities arises mainly from economic activities, the high concentration of the populace, and the availability of social amenities, particularly in cities with poor and inefficient land-use planning [64, 65]. With its growing population, Kano is one of the notable cities in Nigeria experiencing rapid urbanization and development, with increasing demand for transport infrastructures. However, the city lacks an efficient mass transport strategy and framework required of a densely populated urban center. This results in the demand for transport facilities and services exceeding its supply. Hence, creating numerous urban mobility challenges in Kano. The most common mode of transportation in Kano is through road networks using private cars, mini-busses, shared taxis, taxicabs, motorcycles, and tricycles (**Figure 12**), popularly referred to 'Keke-NAPEP' or 'Aidaidaita Sahu' that have the advantage of low fare and availability [66–68]. However, despite the advantages, these modes of transport have contributed to increased vehicle traffic, leading to various transport-related problems that include overcrowding and worsening of traffic congestion (**Figure 13**), deterioration of public transport infrastructures, parking challenges, high rate of accidents, and many others [69]. This serves as a severe challenge to the sustainable urban growth of Kano.

Recently, the Government of Kano State resolved to establish an efficient network of public mass transport by providing new Bus Rapid Transit (BRT) busses in the



Figure 12.
Different modes of transportation.



Figure 13.
Traffic congestion in Kano.

city's metropolis through Public-Private Partnership (PPP) in a bid to improve efficiency, enhance road transport usage and reduce traffic congestion in the city [70]. This is in addition to the major investment in developing several road networks, overhead bridges, and the reconstruction and expansion of more than 31 existing roads in the city. Such bridges include the Madobi/Panshekara Road Junction underpass, Bukavu Barracks underpass and flyover, Dangi flyover and multi-level underpass, and the flyover at Murtala Muhammad Way. The road networks include Sheik Jaafar road, Eastern bypass to Unguwa Uku road, Civic Centre Road, Nassarawa Hospital road, Bompai road, and Abattoir road. Others include Tudun Murtala to Yantsaki Road, Yan Katako to Zaria Road, Manladan Kukul Road, Obasanjo Road, Sharada road, Emirs Palace road, and many others. However, Murtala [71] believes that these attempts at resolving transportation challenges in Kano would not work independently due to fragmentation and inconsistency. Therefore, in addition to the construction of overhead bridges and road networks. The government ought to develop a transformational framework and radical strategy to transform Kano city's transport sector and ease the transport challenges in the city.

According to the Organization for Economic Co-operation and Development (OECD) [72] and Vuchic [73], the most sustainable approach to the mass transportation of people in cities having a large growing population is the reactivation and transformation of the city's mass transit system. As such, the modernization of intra-city mobility networks in Kano and the development of alternatives to mini-busses, shared taxis, tricycles, and motorcycles to effectively manage the city's rising passenger demand for transportation is therefore necessary. The development of a light rail transport system will reduce the increasing demand for road transport by passengers in Kano. It will also ease the city's diverse externalities and negative impacts due to overcrowding, deteriorating public transport networks, worsening traffic congestion, parking challenges, and high accident rates. Hence, the successful adoption and implementation of an efficient transport framework in Kano will no doubt have tremendous impacts on the city's transport challenges.

6.4 Unemployment and increased crime rates

Another challenge faced due to the urban growth and development of most urban centers in Nigeria is the increase in the rate of underemployed and unemployed due to marginal and low productivity [74]. This has continuously affected the employment generation capacity in urban centers such as Lagos, Abuja, and Kaduna in Nigeria, resulting in high rates of unemployment in the country due to the decrease in capacity utilization in the industrial and commercial sectors of the economy. Kano, the largest urban center in Northern Nigeria, is not an exception. Previous studies revealed Kano as the state with the highest unemployed populace in Northern Nigeria [75]. Data released from [Nigeria's National Bureau of Statistics [76]] also indicates the unemployment rate of Kano to be approximately 31.3% in 2018, which is the highest in Northern Nigeria. It presented an increase in the rate of underemployment in Kano from a previous 19.3% in 2017 to 24.3% in 2018. The data from the report also points out Kano as a state with the third (3rd) highest unemployed population in Nigeria of approximately 1,257,130, after Rivers and Awka Ibom having an unemployed populace of 1,673,991 and 1,357,754, respectively. This signifies a growing increase and the high rate of unemployment and underemployment in Kano, which is primarily due to the migration of people in pursuit of jobs without a corresponding increase in new employment opportunities in the city. The shutdown of most industries in Kano due

to the economic downturn further contributes to the inadequate employment opportunities in the city. The consequences of this rising rate of unemployment in Kano are a decrease in quality of life, income inequality, and an increase in crime rate and other social vices such as burglary, theft, armed robbery, kidnapping, rape, political thug-gery, murder, and many others [77, 78]. This, therefore, needs urgent attention for the sustenance of live hood and the protection of lives in the city.

As a result, the Kano State government and Nigeria's Federal government have, over recent years, established various empowerment programs to confront the challenge of youth unemployment in Kano. Such programs include; the National Enterprise Development Programme (NEDEP), the Youth Enterprise With Innovation in Nigeria (YouWin) program, the Youth Employment and Social Support Operation (YESSO), the Subsidy Re-investment and Empowerment Programme (SURE-P), the Agro-processing, Productivity Enhancement, and Livelihood Improvement Support (APPEALS) Project, the Youth Employment in Agriculture Programme (YEAP), the Integrated Youth Development Initiative, and recently the N-Power empowerment program. All these programs are geared towards drastically addressing the problem of youth employment through enhanced skills acquisition and job creation. The recently established N-Power empowerment program employs youth in various sectors of the economy, such as agriculture (N- Power Agro), construction (N- Power Build), healthcare (N- Power Health), teaching (N- Power Teach), and taxation (N- Power Tax).

However, despite these programs and projects introduced by successive federal and state governments, the unemployment and underemployment rate remains significantly high and worrisome in Kano, due to its negative impact on the society and the state's local economy. Some of the factors identified as being responsible for the incessant high unemployment rate in Kano despite these interventions include; the uncoordinated approach between the three tiers of government, the lack of synergy among relevant government authorities in Nigeria, the politicization of youth employment and empowerment interventions as well as the lack of transparency and accountability in the distribution of empowerment and employment opportunities [79]. Therefore, the federal, state and local government should establish and promote inclusive platforms for inter-agency corporations in relevant government agencies dealing with developing, managing, and monitoring various youth empowerment and employment schemes. The three (3) tiers of the government also need to establish a sectoral framework and standards to entrench the principle of accountability and transparency in current and future youth empowerment and employment programs. This is in addition to facilitating the regular publication of reports containing details of various youth empowerment and employment program beneficiaries. This will help significantly help in ensuring transparency and accountability as well as delivering the objectives of such programs.

7. Conclusion

The study demonstrates that managing urbanization in Northern Nigeria's largest city, Kano, like most rapidly growing urban centers in Nigeria, has undoubtedly become one of the most important contemporary problems facing the city in recent years, owing to the inability of relevant government authorities at the federal, state, and local government levels to manage the city's spatial growth and expansion effectively. The findings of this study identify the historical, commercial, industrial,

and socio-economic developments in Kano that serve as a potential driver of the rapid urban growth in the city, which leads to undesirable consequences in the city. Therefore, this study aimed to comprehensively understand the dynamics of urban growth in Kano by examining the city's historical urban development and critically examining the contemporary problems confronting the city due to its demographical and spatial growth. This is discussed in the current findings, which revealed the decay in infrastructures due to urban sprawl, the problem of transportation and high traffic congestion, environmental pollution as well as unemployment and increased crime rates as the most prominent problems facing Kano, Nigeria's second-largest industrial city and the largest city in Northern Nigeria. The study provided a comprehensive, broader, and more in-depth perspective toward understanding these contemporary problems and recommends that it is imperative for all three tiers of Nigeria's government to actively involve the collaboration of the private sector through Public-Private Partnerships (PPP) and take responsibility aimed at tackling the identified problems through the implementation of planned sectoral reforms, strategies, and frameworks. This will go a long way in curbing the contemporary urban problems facing Kano city and achieving sustainable urban growth of the city.

Author details

Auwalu Faisal Koko^{1,2*}, Muhammed Bello³ and Muhammad Abubakar Sadiq⁴

1 College of Civil Engineering and Architecture, Zhejiang University, China

2 International Center for Architecture and Urban Development Studies, Zhejiang University, Hangzhou, China

3 Department of Architecture, Kaduna Polytechnic, Kaduna State, Nigeria

4 Nigerian Building and Road Research Institute (NBRRI), Abuja, Nigeria

*Address all correspondence to: faisal.koko@zju.edu.cn

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