

Review

A Typology for Urban Landscape Progression: Toward a Sustainable Planning Mechanism in Kano Metropolis, Nigeria

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Abstract: The significance of urban landscapes in the current era of concern for a sustainable built environment can never be overemphasized. The study explores the landscape features and typologies of some urban environments within Kano to understand the management effectiveness of urban landscapes in the Kano metropolitan area. At least two wards were purposively selected each from the eight metropolitan local government areas due to their urban landscape and land use. Focus group discussion (FGD) sessions were carried out through with prominent elders and “Masu Unguwanni” (village/ward heads) of each of the sampled wards as well as direct assessments of their physical characteristics to justify the general landscape progression in support of documentation for the present and future generation. The study unveils the layout typology, the scenic points and the ecological and cultural landscapes in the sampled districts. It further reveals that the historic urban forms in Kano are degrading with time, or rather not following the course of sustainability, as the physical surroundings satisfy the immediate needs of the communities. However, the study suggests increasing the awareness of Kano’s urban landscape preservation and the 2011 UNESCO proposal implementation on Historic Urban Landscapes (HUL). Then, the study discourages unhealthy developments within Kano Metropolis and the entire state. It also recommends landscape architects be part and parcel of planning schemes for controlling and regulating urban development via the formal practice of land allocation, land acquisition, building codes, design, planning and construction.

Keywords: Kano Metropolis; urban open space; sustainable built environment; urbanization; historic urban landscape; typological study; sustainable urban planning; urban land use

1. Introduction

In recent years, circumstances are changing as studies in Africa focus on urban landscape improvement and green network [1–6]. One of the commonalities of these studies is the assessment of the depletion states, effects and accessibility of the urban space using several approaches. A perception of cities in northern Nigeria exposed the challenging condition of green infrastructure in fast decline due to severe forces from the human influence index [7].

Nasidi [8] assessed environmental challenges that surface due to uncoordinated human influence (disturbance of open space, deforestation in Kano, Nigeria, and other cultural values) while Halima [9] analyzed the declining state of urban greenery in metropolitan

Kano along with urban development as it disrupts ecological equilibrium with the rising invulnerability of land.

Moreover, most of the research on urban space in West African cities focused on a mundane protection approach that failed to harness adaptive schemes of the past or emerging landscape index approaches of recent times. Moreover, they cease to correlate the revolutionary practices of selected precincts to explore the principles that affect plot layout formation, processes and phenomena, and the summarizing typology of landscape values, and establish a comprehensive framework. This study attempts to fill this gap.

Kano was founded in the ninth century and its development and planning commenced around 1095–1134 [10,11]. As the third major city in Nigeria after Lagos and Ibadan, Kano is the administrative capital of Kano state. The demographic development of Kano was due to its suitable landscape, it being a mercantile city, its hospitality and accessibility [12]. The wet season starts in May and ends in September, with August being the rainy month in Kano. The yearly rainfall differs from 600 to 1200 mm. The mean yearly temperature fluctuates from 26 °C and 32 °C [13]. There is a slight disparity in temperature, compared to rainfall, but the mean temperature rate is usually colder throughout Harmattan season [14]. The Challawa and Jakara rivers remain the major waterways within the city catchment area. In contrast, the Kano river irrigation scheme, sited to the south and northeast of the ancient municipalities, supplies large areas of irrigated land. The city's peri-urban environments are dominated by cultivation parklands, meadows and speckled trees with a quite low quantity of natural forested savannas [4,15].

1.1. Landscape-Based Approach

The word 'landscape' is broadly used. Besides common usage, it is used in many disciplines such as history, art, geography, archaeology, planning and architecture, to mention a few. There is also figurative usage—political landscape and linguistic landscape are such instances [6,16]. In addition, "the study of historic urban landscapes alongside its typology originated by describing the fundamental character of metropolitan landscapes in the early development of city morphology within the profession of geography" [16]. "Urban typo-morphology begin to seize form as a structured field of knowledge at the end of the 19th century [16,17]. Several key extractions were in the work of German speaking geographers. Similarly, ref. [18] suggested, "a typology of the urban landscape as the object of research in architecture".

To connect people to their housing environment, one should recognize that the physical environment we construct expresses our socio-economic values. Indeed, ref. [19] has also observed that the buildings that we produce and their layouts are a direct product of a balance between a culture and its environment.

Human shelter is a communal survival element that manifests in one way or another. From the very origin of civilization, humanity has been intensely affected and thus conditioned by its natural surroundings. Humanity protected itself in huts, caves, trees, etc., as was evidenced in primitive times. The class of a shelter or dwelling is relative or a matter of opinion. Humanity cannot flee the increasing effect that would ultimately affect its style and personality. "Architects or designers are in an insightful situation, which makes them appreciate their community and show conscientiousness to an individual client and to the contextual look and projection of the progression of life itself" [20].

"Urban fragments often characterize a distinctive population density, remarkable nature and metropolitan morphological characteristic. They provide the circumstance in which heritage assets are cited, but they must not be treated as simple in context, because it is often a group of objects and their context that generates value" [21].

"The preservation of surviving urban assets (urban concepts, structures, historic buildings and sites, evolutionary processes, or local traditions and practices) left to represent significance is called a landscape-based approach. One of the key aims of such a landscape-based approach is considering conservation as reducing the undesirable impacts of socio-

economic progression on what is measured to be of importance, by incorporating heritage protection and urban development” [22–24].

The situation of cultural landscape management has been changing towards more all-inclusive methods, comprising ideas such as the intangible landscape in the context of sustainable urban development. In addition, the cultural landscape has been accompanied by a greater consideration of the economic and social function of ancient cities [22,25–28].

The historic urban landscape (HUL) approach guarantees that the shift towards a smart city progressive model based on precise local cultural resources is for technological improvement. In other words, the eco-city approach becomes culture-led as it kindles places as spatial “loci” for implementing circularization and synergy measures [29].

‘Gorna’ housing project designed by Hassan Fathy was built using traditional ideas and obtainable local resources with all the essential land uses incorporated. He [30] asserts that “tradition is not necessarily stagnant; it can be enhanced and preserved in Africa”.

According to [29], cultural heritage is a major constituent of the urban system: it ought to be perceived as a dynamic sub-system that progresses over time under the tension of many different forces, though still maintaining its uniqueness, reliability, and continuity. Assuming Geddes’ analysis, cultural heritage preservation and management should be considered via a dynamic perception, characterized by synergies, circular creativity and processes.

It is also noticeable that people can base their choice on an exceedingly broad range of potentials, and can transform an arid region or topographical level hills within broad limits to landscape and improve the natural surroundings. Kano Metropolis is not an exception and has undergone several transformations in urban landscape and typology [23,31]. Moreover, urban land can be described as the art and science of ordering the use of land for building positioning, commerce, communication, primary and public movement routes, manufacturing, sport, and recreation to attain the utmost possible economic ease, and landscaping for the planning of ideals [32–34].

1.2. Sustainability and Urban Landscape

Sustainability has been trending as a universal term to illustrate the progression that includes a variety of forms that the procedure may take [35]. The accessible definitions in the literature are in three categories [36] and they focus on these subjects: (i) preserving benefits attained through an early program, (ii) maintaining the program in an organization, and (iii) building the capacity of the benefiting public to maintain a program. Following this classification as a basis, ref. [36] defines sustainability as ‘the technique of ensuring an adaptive prevention scheme and a sustainable development to be incorporated into current operations to benefit various stakeholders’.

At first, the authors in [36] viewed sustainability as a transformative process with explicit sustainability acts pushed to reinforce organizational infrastructure and the inventive features necessary to uphold a particular innovation. Subsequently, ensuring an adaptive prevention scheme was seen as a form of sustainability practice. These schemes must be open to alteration, hence building a setting for innovations to adapt to the system, if compulsory, in which they are established. Thus, an assumption is that sufficient infrastructure is essential to sustainability.

As such, sustainable planning in the context of the metropolitan landscape remains an inclusive and elaborate interaction between urbanization, population increase, economic development, and the living environment [37]. Sustainable planning entails the running of those aspects that will support the continuation of the urban space for the inhabitants, to ensure the environment remains livable for the community [38]. Moreover, there are sustainable aspects that will support the existence of a sustainable urban landscape [37] including having good (i) demographic and socio-economic settings; (ii) planning and appropriate management towards persuasive urban migrants; and (iii) planning by-laws and authorities. In this context, the public must know the value of an urban landscape to value the existence and need for urban forms and spaces.

1.3. Aim and Objections

The study explores the landscape features and typological assessment of some settings within urban Kano, intending to understand the effective management of urban landscapes in the Kano Metropolitan area. The specific objectives are

- i. To authenticate the historical establishment of some selected wards/districts within the Kano metropolis.
- ii. To verify the landscape assets and land-use typology of some sampled wards/districts within the Kano metropolis.

2. Materials and Methods

Metropolitan Kano is closely sited at the heart of Kano State (latitudes 11°52' N and 12°07' N and longitudes 8°24' E and 8°38' E). In 1820, the population was about 30 to 40 thousand [39]. It is in the semi-arid savannah zone and has distinctive wet and dry seasons [40]. It has an estimated population of over 10 million. Following the 2006 census, the population of Kano metropolis was about 2.2 million, which made it the second largest after Lagos [41], and it rose to more than 4 million in the subsequent census (NPC, 2009). It is also the trading hub of Northern Nigeria [42].

As a typological framework for the Kano metropolitan area, the study adopted a framework developed based on knowledge acquired from a literature review alongside the study objectives. The process entailed field observation/visual evaluation and focus group interviews/FGD that paved the way for research findings. This study adopted a two-stage qualitative approach using spatial analysis methods (inventory/direct assessment of the physical characteristics of the study area) and focus group discussion (FGD) sessions with eight custodians/prominent elders and 11 “Masu Unguwani” (ward heads) of some sampled wards. From April 2020 to November 2022, the authors performed field observations and collected spatial information. The first stage involved mapping urban forms/spaces and focus group interviews within the sampled wards, primarily starting with defining the context and identifiable attributes of urban landscapes and the layout of the area surrounding metropolitan Kano. Accordingly, the collected information from the urban spaces within the wards (such as literature, behaviors and maps) was in the form of recording techniques, in-depth interviews, sketch outlines and measurements. In this context, the essentials of the landscape form comprised both objective elements (including layout typology, structure and core) and subjective (such as spatial behaviors and boundary functions). It also involved a review of published documents (both online and printed) within the framework of the Kano region and urban landscape. With the nature of the urban disposition of Metropolitan Kano, several logical ways were utilized in the selection, sorting and ordering of the neighborhoods and locations.

“The most prominent is the geographical boundaries (Figure 1), hence eight metropolitan local government areas (Dala, Fagge, Gwale, Kano Municipal, Kumbotso, Nassarawa, Tarauni, and Ungogo) are the case study locations for the study rather than the respective four (4) city sectors and the wards”. Ordering using local government areas was adopted as traditional administrative power is being transferred to the district head of each local government. Purposive and convenient sampling was used in the selection of the areas (wards) of study within the metropolis and focus group discussion (FGD) sessions, respectively. At least two wards were purposively selected from each local government area due to the availability of urban landscapes and massive transformation in such areas.

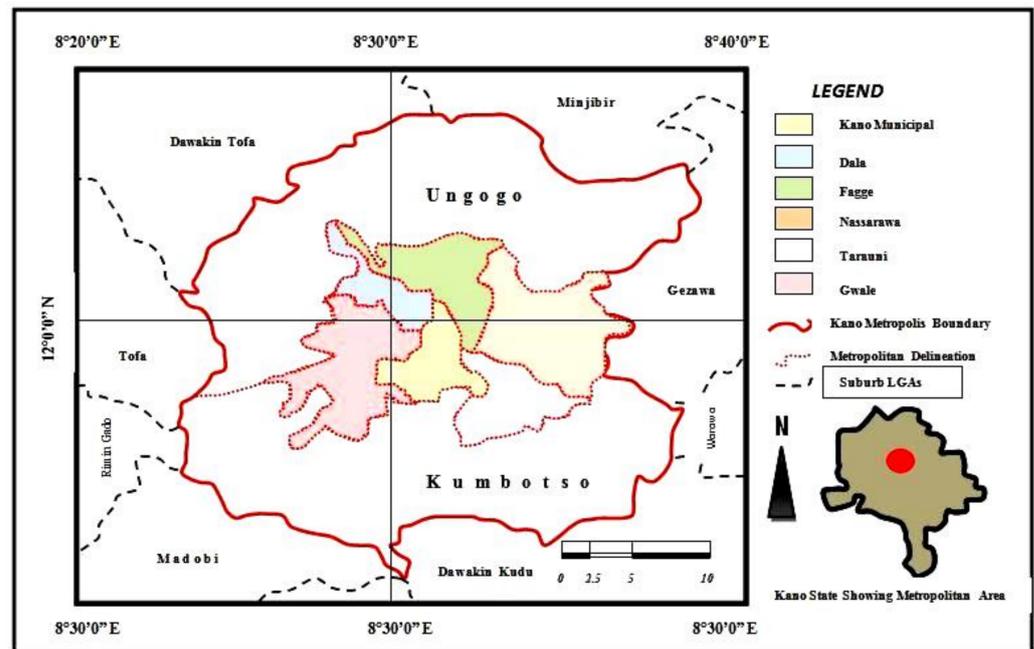


Figure 1. Kano metropolitan map. Source: Authors, 2023.

3. Results

3.1. Theoretical Findings

Data were gathered by reviewing and analyzing (content analysis) documentation on the prominent wards within Kano Metropolis. This is presented in line with the first research objectives.

3.1.1. Kano Urban Patterns in Pre-Colonial, Colonial and Post-Colonial Period

Kano is similar to Zaria and Katsina in its pre-Islamic foundations, in its old walled Hausa–Fulani centers of administration, of trading and of crafts and its colonial development, although Kano was founded earlier than Zaria and has been a more important commercial as well administrative center in both colonial and independent Nigeria. It has been better described than any of the other northern Nigerian cities, starting with the Kano chronicles [43].

Before the actual founding of Kano City, several sites were sacred to the local inhabitants. Dala Hill, where an early iron smelting furnace has been traced to the 7th century [44], was the home of “Maguzawa” (Pagan Hausa). An important sacred tree was located on the site of the “Madabo” mosque in “Madabo” ward, just to the east of Dala Hill. There were sites where ceremonies were performed until the 19th century: The first was near the old palace at “Kofar Ruwa”; the second was the well of “Maiburgami”; and the third was a grove at “Bakin Ruwa”, located near Jakara, the low-lying ground west of the market [32]. These areas are near the core of the modern city of Kano.

The first city wall was built between 1095 and 1134 during the reign of the third Hausa king [15]. After the ceremonial slaughter of 100 cattle, the wall was started somewhere east of the market near Jakara stream, where it drains, and was constructed counterclockwise to include both the laterite-capped, residual hill of Dala and Goron Dutse. It was finally completed in about 1150. Sarki Muhammadu Rumfa, the Emir of Kano (1463–1499) extended the south eastern part of the walls to include a palace compound, and moved from the old pagan site east of Dala near “Kofar Ruwa” to the present location.

The introduction of colonial rule and administration came to Northern Nigeria from the south. In January 1900, the British protectorate of Northern Nigeria, proclaimed by Fredrick Lugard, was established after the military campaign of 1900–1904 [45]. This latter development still affected urban development and transformation sixty years later.

In Northern Nigeria, Sir Lugard found an organized system of Muslim emirates formed from former Hausa states as a result of the Fulani jihad, and states were administered by emirs through Shari'ah law by an "alkali" (judge). The introduction of the railway line brought life to the trade contacts with the Kano region. People also took advantage of good agricultural terrain for urban growth and a good water supply. Animal hides and skins, groundnut, cotton, ginger, and minerals were the main products exported from this railway infrastructure.

In 1917, Lugard, as governor general with the goal of amalgamation, created the township ordinance, which abandoned the use of the government station and cantonment and made use of township and urban district. The ordinance also classified the township into three, each with a different degree of municipal responsibility. The first category, the European reservation, comprised a colonial residential area, railway area and commercial area; the second, non-European reservation (Sabon Gari), consisted of a government clerks' area, artisan and laborers' area, railway area and market/trade spot; the third category included special areas (Tudun Wada), considered not as a township but including building free-zones, police stations, prisons, barracks/army lines, and fell-mongering plots. Each area eventually had to be planned according to the local circumstances and terrain. In any case, a "green belt" was always be retained in planning proposals to provide areas to be enclosed for recreation and artistic beauty and break urban monotony [46].

In this approach, land and plots were allocated and provided with sewage management, drainage, water, electricity, access roads and a range of individual and commune services. In addition, the aim was to include additions and improve services and facilities within the entire neighborhood. Meanwhile, the "squatters upgrade" was to convert the existing traditional housing stock, particularly in the serviceable areas in central locations where people could maintain their current access to their commercial routine, schools and work. What constituted the city of Kano and its environs was virtually encompassed by the city wall and was within an area of 17.5 square kilometers in the early 1900s when the colonial masters came [47,48].

The modern Kano metropolitan area constitutes two main areas, namely "Birni/Cikin Badala" (walled city), considered the inner-city, and Wajen Badala (outside city), the township. "Wajen Badala" settlements include several suburbs which follow the cardinal axis of the walled city. The oldest is the Fagge suburb, founded in the 12th century as a camping place for northern traders of the towns north of the Sahara, whereas the "Sabon Gari" suburb was established in 1914 to cater for the people that are mainly from the southern part of the country [49]. Other suburbs include "Tudun Wada" and "Dakata", which serve as a squatter expansion of the aforementioned suburbs, although they have a blend of various ethnic groups, with Hausa as the predominant inhabitants [45], and the Nassarawa and Bompai suburbs situated to the east of the walled city, constituting the former colonial seat of government. Furthermore, the former villages of Gyadi-Gyadi, Hotoro, Hausawa and Naibawa are located to the southeast; Sheka, Dorayi and Sharada are to the southwest; and Kurna, Rijiyar Lemo and Ungogo are located to the north of the walled city. According to [14], this suburb area has two settlement patterns that entail an irregularly shaped traditional nucleated resident pattern with narrow streets and a contemporary nucleated pattern where houses are rectangular- or square-shaped and attached with wider roads.

Two decades of developmental plans were prepared by Trevallion in 1963 [50] and subsequently revised in 1976, 1980 and 1990 [10]; however, this 1990 preparation was disbanded due to a shortfall in enforcement as well as bureaucratic, technical, and financial concerns [10]. In 1963, the plan proposed spreading out to the southwest and designating potential road networks and neighborhoods [11]; this was partially executed. The urban landscape of Kano has gone through a range of transformations from the collection of traditional architecture to an Islamic style, and to the British colonists' changes in landscape morphology as well as land development policies [51].

When combined, government policies and natural landscapes or traditions in the Hausa–Fulani background have resulted in a walled city, inspiring compound patterns, agricultural lands as well as the usual rocky hills. The typology expresses the idea of a triple open space or hub in traditional family residences that is similar to the model of cities bordered by a wall with a doorway and a city defense wall with a gateway.

3.1.2. The Evolution of Some Wards within Metropolitan Kano

Kano has ceased to be restrained by its wall in the urban plane because the old city became an entity by itself while Fagge, Gwagwarwa, Gyadi-Gyadi, Hausawa, Kurnar Asabe, Nasarawa, Na'ibawa, Sabon Gari, Tarauni and Tudun Wada all developed into discrete wards. This phenomenon (both anticipated and real growth) is the power of the manifestation of the Trevallion blueprint in 1963 with a vision to set a legislative structure that could guide, control and manage the growth of metropolitan Kano [26,31].

(a) Ward delineation procedures

Having eight local government areas in the Kano metropolis, at least two wards were purposively selected from each local government area: Dala (Dala and Kofar-mazugal), Fagge (Fagge and Jabba), Gwale (Gwale and Dorayi/Kabuga), Kano Municipal (Sharada and Yakasai), Kumbotso (Challawa and Kumbotso), Nassarawa (Dakata Kawaji/Badawa and Hotoro), Tarauni (Babbangiji and Unguwa Uku) and Ungogo (Bachirawa and Ungogo).

The methods of data collection included focus group discussion (FGD) sessions with custodians, prominent elders, or “Mai Unguwa” (ward head) of each sample ward. It involved a review of published documents (both printed and online) in the context of the Kano region. With the nature of the urban disposition of metropolitan Kano, several logical ways were used in the selection, sorting and ordering of the neighborhoods and locations.

(b) Description of the selected wards

Below is the historical establishment of the sampled wards, arranged alphabetically:

- i. Babbangiji ward is located in the Tarauni local government area, accessed via the “Massalacin Murtala” road southwest of Kano Metropolis. The Hausa/Fulani clans dominate the commune and other tribes from the northern part of Nigeria. They are mostly artisans, builders, carpenters, and small-scale traders as well low-income workers. There is no marketplace, but it has clinics, government primary schools, and secondary schools for boys and girls.
- ii. Bachirawa is situated in the Ungogo local government area, accessed via the Katsina road in the northern part of metropolitan Kano. Established in the 1980s and dominated by the Hausa/Fulani tribes, most people come from Katsina state and other tribes from the northern part of Nigeria. It consists of 75% contemporary Hausa residential structures and 25% modern buildings.
- iii. Challawa, located in Panshekara, in the Kumbotso local government area in the western part of the metropolitan areas. It was originally a Fulani settlement due to its closeness to river Challawa, and it had a rich soil suitable for farming and the rearing of animals. The town started developing in the early 1970s due to the institution of the Kano Water Works (WRECCA) and manufacturing industries. Various tribes from all parts of the country live there.
- iv. Dakata/Kawaji/Badawa is located in the Nassarawa local government area and accessed via the Yankaba/Hadejia road, in the northeastern part of Kano Metropolis. Dakata/Kawaji was established around the early 1950s and a few houses are built in mud and there are also modern building materials such as cement blocks, metal doors, and windows. On the other hand, Badawa was established in the late 1970s. It is an exemplary ghetto commune with 97% contemporary typologies.
- v. Dala is positioned in the Dala local government area and is a name given to one of the ancestors of the “Abagayawa”, known as the original indigenes of Kano. It has been

associated with iron smelting and smithing, and the “Tsumburbura Shrine” [43,45]. Dala ward is a settlement at the bottom of a hill, with a gentle slope of about 2–3 mm in the east and south direction, and about 2 m in the northern direction toward the Gwammaja Road, while due west, there is a deep and dirty water body of about 6–10 m depth.

- vi. Dorayi/Kabuga is located in the Gwale local government area and is accessed via the BUK road, almost at the center of the Kano metropolitan area. The majority of the residents of Rijiyar-Zaki, Dorayi, Kabuga housing estate, and Yamadawa residential areas are, by origin, indigenes of the old city of Kano, who for reasons of choice, city slum, improvement in economic status, and proximity to the place of work, among others, decided to relocate. While Dorayi is a progressive slum commune with 86% contemporary typologies, Kabuga remains a planned layout.
- vii. Fagge/Jabba is located in Fagge local government area. Fagge is almost in the center of Kano Metropolis and accessible from the Ibrahim Taiwo road. It is one of the initial areas laid out by the colonial masters in the later 1950s and is a predominantly non-indigenous settlement (absorbing Katsina and Niger immigrants). However, Jabba is accessed through the airport road due northeast of Kano Metropolis. It was founded around 1960 and was originally a resettlement scheme for residents or villagers in the area of the present Aminu Kano International Airport, but is now dominated by the Igbo business class and other ethnic groups from southern part of the country.
- viii. Hotoro is located partly in Tarauni and partly in Nassarawa local government area. It is accessible via the Maiduguri road and the eastern ring road by-pass due southeast of metropolitan Kano. Created around 1950 and initially under Ungogo District, it consists of three parts: Hotoro Kudu (South), Hotoro Arewa (North), and Hotoro Danmarke. It was later segregated into sub-units or wards headed by “Dagaci” and “Mai Unguwani”, with the respective ward heads now separated by the Maiduguri highway due south east of Kano Metropolis. Ref. [45] proclaims that the name Hotoro derived from Fulani, from the word “Hutu”, meaning rest. The area used to be the resting place for caravans and hunters (Fatake and Mafarauta) and used as a transit camp (Zango) under one famous well-known “Rijiyar Hagama”.
- ix. Kofar Mazugal is located in the Dala local government area, accessed via the Gwammaja/Mayanka road due south of Kano Metropolis. It originated in the 19th century when the area was predominantly dominated by blacksmiths who operated their trade there. The name was taken from a fire-blowing instrument used by the smiths. Blowing of fire continually emits the sound “Zugal-Zugal” which is why the area is called Mazugal [45]. As such, when the ancient wall surrounded Kano, a gate was opened at Mazugal, named “Kofar Mazugal”.
- x. Kumbotso remains in the Kumbotso local government area, and joined examples of traditional Hausa and Fulani communes. A modern settlement was purposely established for irrigation farmers from the Kumbotso River from 1977–1982, during Rimi’s administration. The topography remains similar to that of Panshekara, but in recent time it hosts educational institutes, industries, residential quarters, trade zones and farmland.
- xi. Sharada is situated in the Municipal local government area, accessible via the B.U.K road due south of Kano metropolitan area. It was established around the 1950s by Malam Aminu Kano, a leading politician in Kano politics. It has two sections and Sharada “Fegin Mayu” is occupied by more craftsmen and low-income earners than the industrial zone which was formally farmland.
- xii. Ungogo remains in the Ungogo local government area, accessible through the Katsina road northeast of the Kano Metropolitan area. It was established over 200 years ago as a Fulani cattle farm settlement, and around 1970, the then government sub-divided

the farmland into housing layouts. Although in recent times, there is a lot of infill in the typology.

- xiii. Unguwa Uku is positioned in Tarauni local government area, accessible via the Zaria Road due southwest of Kano Metropolis. Historically, the name originated from three Fulani compound heads, namely Alu, Mohd, and Nono, surrounded by their farmland, for farming and rearing their animals. Each of them settled in different areas that produced the term “Rikuni Uku” (three provinces or villages), later called “Unguwa Uku” around 1970 [48]. It has one “Dagaci” (district head) and three ward heads (Masu Unguwani) and is dominated by low-income earners such as traders, craftsmen and workers.
- xiv. Yakasai remains among the three heads of pre-Islamic Hausa, alongside ‘Gwale’ and ‘Sheshe’, who came from the historic empire of Gaya, east of Kano [20]. The current ward has been relocated from an older ward since the region became a part of the city only after the 15th century extension of the city wall. At one time, Yakasai was the largest ward in the city, in terms of land and inhabitants; later, it was sub-divided into A and B wards [45]. In 1961, an added ward emerged, called Yakasai “Sabuwar Unguwa”, founded to provide relief in governance. During colonial times, its location, its relationship with the Mallam class, and its ability to take in immigrants made it a quarter preferred by the mid-level Native Authority civil servants.

3.2. Spatial Data

Quantitative and qualitative data were gathered by analyzing and observing the sites directly through an observation checklist (field study/spatial analysis). This is presented in line with the second research objective.

Landscape Forms and Typologies

As stated earlier, the following areas were also considered in the spatial analysis: Dala (Dala and Kofar-mazugal) see (Table 1), Fagge (Fagge and Jabba) see (Table 2), Gwale (Gwale and Dorayi/Kabuga) see (Table 3), Kano Municipal (Sharada and Yakasai) see (Table 4), Kumbotso (Challawa and Kumbotso) see (Table 5), Nassarawa (Dakata Kawaji/Badawa and Hotoro) see (Table 6), Tarauni (Babbangiji and Unguwa Uku) see (Table 7) and Ungogo (Bachirawa and Ungogo) see (Table 8).

Table 1. Observational checklist of the sampled environments in Dala local government area, Kano Metropolis.

Wards	Description
Dala	The soil is reddish, sandy, gravel and weak for foundation. A total of 80% of the houses are one-storey buildings built in with mud and cement brick, and roofed with zinc. Due to the increase in population, most of the buildings at the edge of the hill are refilled and raised to meet the required floor level. Transformation is observed largely in bigger family houses (Babban Gida) that are sub-divided (i.e., Alfanda houses) and re-built due to inheritance by descendants of the deceased compound head.
<i>Landscape forms:</i>	The notable landmarks include the first orthopedic hospital in Northern Nigeria, Masaka textile factory, “Kofar ruwa”, Isyaku Rabiw residence, Dala Hill and a building material market, while due west is a deep and dirty water pond of about 6–10 m depth.
<i>Embodied Typology:</i>	10 × 15 m, 15 × 15 m and 15 × 30 m layout patterns.
Kofar Mazugal	Over 86% of buildings are one-storey buildings in mud and brick. It is a typical traditional settlement with poor drainage, population congestion and other environmental hazards. The sample residence is transformed with organic, rectangular and square shapes.
<i>Landscape forms:</i>	The notable landmarks include Kofar Mazugal City Gate, Alhassan Dantata house, Yan Awaki Market/“Maitatsine” House.
<i>Embodied Typology:</i>	96–913 m ² ; 10 × 15 m, 15 × 15 m and 15 × 30 m layout patterns.

Source: Authors Field Work, 2022.

Table 2. Observational checklist of the sampled environment in the Fagge local government area, Kano Metropolis.

Wards	Description
Fagge	One of the initial layouts by the colonial masters in the later 1950s, with over 92% one-storey buildings. Over 75% of the houses have a commercial shop at the exterior for tailoring, provisions, and so forth. Transformation is as a result of infrastructure construction, inheritance and socio-economic activities. The notable landmarks include “kofofin Fagge” (the gates), “Dandali”, Kano Hajj camp, “Kwari” textile market, hospitals (M. Jidda and IDH), “Kudidifinwafa” (water pond), MAK International Airport, “Kwakwaci” green matrix, Jumm’at Mosque, a police station and courts.
<i>Landscape forms:</i>	10 × 10 m or 15 × 22.5 m, 30 × 30 m layout patterns.
<i>Embodied Typology:</i>	
Jabba	It has poor accessibility due to persistent soil erosion with a poor drainage system. The settlements show a remarkable 90% typical contemporary typology in most of the residential houses. Presently, it is facing flood risk due to an eroding coast toward the northeast end. It was transformed into a settlement due to the relocation scheme of residents or villagers from the area of the present Aminu Kano International Airport. The notable landmarks include the military base/barracks and Aminu International Airport.
<i>Landscape forms:</i>	15 × 22.50 and 30 × 30 mm layout patterns.
<i>Embodied Typology:</i>	

Source: Authors Field Work, 2022.

Table 3. Observational checklist of the sampled environment in Gwale local government area, Kano Metropolis.

Wards	Description
Gwale	Over 92% of the buildings are one-storey buildings in mud and brick. It is a typical traditional settlement with poor drainage, population congestion and a poor waste disposal system. Transformation is observed largely in the degradation of the old city wall and backfilling of some “Kudidifis” (water ponds)—“Kukku’ba” and “Mai Allo”. The notable landmarks include Bayero University (BUK), Goron Dutse Hill, the old city wall and gates (Dan Agundi, Na’isa, Gadon Kaya, Fanfo, etc.), the ‘Haures’ (Wanki, Shanu, etc.), graveyards, FCE Kano, Goron Dutse Prison and Galadanci Mosque.
<i>Landscape forms:</i>	96–913 m ² ; 10 × 15 m, 15 × 15 m and 15 × 30 m layout patterns.
<i>Embodied Typology:</i>	
Dorayi/Kabuga	Over 87% of the buildings are in contemporary bricks blocks and it is also among the indicators of measuring urban environmental quality, based on the minimum housing standard in Nigeria. The notable landmarks include the Dorayi mini palace/farm house, “Kabuga” underpass, a pedestrian bridge by the old BUK site and “Jan Bulo”.
<i>Landscape forms:</i>	8.5 × 15 m, 15 × 15 m, 15 × 22.50 and 30 × 30 m layout patterns.
<i>Embodied Typology:</i>	

Source: Authors Field Work, 2021.

Table 4. Observational checklist of the sampled environment in the Municipal local government area, Kano Metropolis.

Wards	Description
Sharada	It consists of 94% contemporary buildings and 20% one-storey buildings, both in mud and cement brick with zinc sheet roofs, and houses plastered in cement with metal doors and windows. Generally, it consists of a traditional layout/houses, with 20% for renting to low-income earners, with unremarkable roads and poor drainage. It is a typical contemporary Hausa residential building settlement. Transformation is as a result of industrial infrastructure, construction and socio-economic activities. The notable landmarks include an industrial estate, zone 1 police station, recreational facilities and religious places.
<i>Landscape forms:</i>	8.5 × 10 m, 10 × 10 m, 15 × 22.5 m, and 30 × 30 m layout patterns.
<i>Embodied Typology:</i>	

Table 4. Cont.

Wards	Description
Yakasai	A total of 85% of the sample houses are one-storey buildings in mud and cement bricks. Due to an increase in population and lack of space for expansion, its houses are sub-divided due to inheritance, and renovated by new owners to suit their needs. In a contemporary archetype, it has sufficient vehicular access roads, but linked inter-connecting alleys (Hanya) with waste drainage in middle of the street. Transformation is observed largely in the degradation of the old city wall.
<i>Landscape forms:</i>	The notable landmarks include the “Rimi” market, Gidan Ma’aji and “kofar Nassarawa”, Investment House, Gidan Ado Bayero, “Gidan Murtala” and a fly-over.
<i>Embodied Typology:</i>	96–913 m ² ; 10 × 15 m, 15 × 15 m and 15 × 30 m layout patterns.

Source: Authors Field Work, 2021.

Table 5. Observational checklist of the sampled environment in the Kumbotso local government area, Kano Metropolis.

Wards	Description
Challawa	It is located in a water-logged area with undulating terrain, poor sanitation and a poor drainage system. It is a typical squatter slum with 70% dilapidated buildings. Generally, 80% of the houses are designed for commercial purposes (renting) in one-storey buildings.
<i>Landscape forms:</i>	Transformations began with establishment of Kano State Water Works and manufacturing industries and now include socio-economic reasons. The notable landmarks include River Challawa, a water treatment plant, industrial estate and rail road.
<i>Embodied Typology:</i>	8.5 × 10 m, 10 × 10 m, 15 × 22.5 m, 30 × 30 m layout patterns.
Kumbotso	Initially, there were Hausa and Fulani settlements with 90% of the buildings in mud plastered with cement, as well as 80% zinc roofs and 20% mud, and 95% cement screed floor finishing. Later, a modern settlement was established for irrigation farmers from the Kumbotso River from 1977–1982. Transformations have to do with the establishment of manufacturing industries and residential estates. Notable landmarks are the River Kumbotso, “Dangwauro” Economic City, Sa’atu Rimi College of Education, residential estates (Kwankwasiyya, Amana and Almkab City) and some industrial expansion.
<i>Embodied Typology:</i>	7.5 × 15 m, 10 × 10 m, 15 × 22.5 m, 30 × 30 m with sufficient wider road networks in grid patterns.

Source: Authors Field Work, 2022.

Table 6. Observational checklist of the sampled environment in the Nassarawa local government are, Kano Metropolis.

Wards	Description
Dakata/Kawaji/Badawa	Dakata/Kawaji are typical contemporary wards. They have a good planning layout by the government, with both major and minor roads, which are about 5–10 m wide, even though they have an acute water shortage. However, Badawa is typical ghetto settlement with undulating terrain, poor sanitation, and a poor drainage system. It is a typical squatter slum with 67% dilapidated buildings. Generally, 82% of the houses are designed for commercial purposes (renting) in one-storey buildings. Transformations began with the establishment of manufacturing Industries and for some socio-economic reasons. The notable landmarks include a fruit and vegetable Market, religious places, an industrial estate (Bompai industrial expansion) and rail roads.
<i>Landscape Forms:</i>	7.5 × 10 m, 10 × 10 m, 15 × 15 m, 15 × 22.5 m, 30 × 30 m layout patterns.
<i>Embodied Typology:</i>	
Hotoro	A total of 95% of the Hotoro (arewa) buildings are contemporary houses, with 68% one-storey houses and almost 70% of the houses with cement block walls and zinc sheet. It also has fairly interconnected roads, but a poor drainage system, exposed to the street. There is no dump refuse point. Interestingly, it is the only ward with over 95% contemporary toilets rather than traditional pit latrines, despite the fact that they experience serious water shortages.
<i>Landscape Forms:</i>	Transformation began with the establishment of oil/gas filling stations and commercial shops for low-class business. In the early 20th century, a modern settlement (Ladanai and Tinshama) was purposely established for expansion. Notable landmarks are the NNPC mega-station underpass/flyover, Sani Abacha bypass, residential estates (Ladanai and Tinshama), religious places and some oil/gas filling stations (Chula, Nur, Majiya, Matrix, etc.).
<i>Embodied Typology:</i>	7.5 × 15 m, 10 × 10 m, 12 × 12 m with moderate access, while the 15 × 22.5 m and 30 × 30 m comes with a sufficient road network in grid patterns.

Source: Authors Field Work, 2022.

Table 7. Observational checklist of the sampled environment in the Tarauni local government area, Kano Metropolis.

Wards	Description
Babbangiji/Darmawa/Hausawa	Hausawa was established 150 years ago, and owners of farmland from the old city decided to migrate outside due to the problem of congestion in the city in 1972. A modern layout was established at Babbangiji in 1980s during Alhaji Abubakar Rimi's administration, as the resettlement layout for people or occupants at the present Aminu Kano Teaching Hospital along the Zaria road. <i>Landscape Forms:</i> Transformation is as a result of infrastructural construction and socio-economic activities. The notable landmarks include Aminu Kano Teaching Hospital and Masallacin Murtala. <i>Embodied Typology:</i> 10 × 10 m or 15 × 22.5 m and 30 × 30 m layout patterns.
Unguwa Uku	A total of 79% of the houses are one-storey buildings with characteristic features of contemporary typologies. A total of 70% of the house are built with cement brick and covered with zinc sheets. It is considered as one of the sub-standard settlements in the Kano metropolitan area. <i>Landscape Forms:</i> Transformation is as a result of infrastructure construction and socio-economic activities. The ward is dominated by low-income earners such as traders, craftsmen and workers. The notable landmarks include the Yan Awaki Market, NNPC Depot and NNDC Quarters. <i>Embodied Typology:</i> 7.5 × 15 m, 10 × 10 m, 12 × 12 m have poor access, while the 15 × 22.5 m and 30 × 30 m are in grid patterns.

Source: Authors Field Work, 2022.

Table 8. Observational checklist of the sampled environment in the Ungogo local government area, Kano Metropolis.

Wards	Description
Bachirawa	A total of 90% of the buildings are constructed in cement brick covered with zinc roofs, with modern design concepts and construction. The plot is laid out in a grid pattern planning system, with sufficient open space for lighting and ventilation. It is a typical contemporary building/archetype settlement, but with a poor drainage system. <i>Landscape Forms:</i> Transformation is as a result of infrastructure construction and socio-economic activities. The notable landmarks include the old NRC Secretariat (Bachirawa Hospital), a police outpost, religious places and filling stations. <i>Embodied Typology:</i> 8.5 × 10 m, 10 × 10 m, 15 m × 15 m or 15 × 22.5 m and 30 × 30 m layout patterns.
Ungogo	A total of 89% of the houses are built in traditional mud with "Azara", plastered with cement on the walls and floors, and with a poor waste drainage system. The lack of economic activity and access roads limits its general development. The settlement is moderately populated due to a limitation in plot size for a specific family size, which makes it static in its physical development. Transformation is as a result of socio-economic activities. <i>Landscape Forms:</i> The notable landmarks includes the Fanisau mini palace and farm house, a technical college, Fanisau Hill and Kano free trade zone. <i>Embodied Typology:</i> 8.5 × 10 m, 10 × 10 m, 15 × 15 m, 15 × 22.5 m, and 30 × 30 m layout patterns.

Source: Authors Field Work, 2022.

Physical observation carried out portrays the field study of landscape forms and its progression. Some of the Historic Urban Landscapes (HUL) within the sampled wards are presented as multiple sources of evidence in Figure 2.



(a)



(b)



(c)



(d)



(e)



(f)



(g)



(h)

Figure 2. Portrays the field study of landscape forms and its progression. As multiple sources of data from some of the Historic Urban Landscapes (HUL) within the sampled wards as presented in (a) Kofar kudu, Kano Municipal LGA; (b) Masjid IsyakuRabiu, G. Dutse, Dala LGA; (c) BUK Sport Arena, Old

Site, Gwale LGA; (d) Masjid Murtala Muhammad, Tarauni LGA; (e) Golden Jubilee, State Rd, Nassarawa LGA; (f) MAK International Airport, Fagge LGA; (g) Dala Inland Dry Port, Kumbotso LGA; (h) District Head Residence, Ungogo LGA. Source: Authors, 2023.

Furthermore, from the bar chart Figure 3 the study reveals the embodied layout distribution within the sampled wards. It unveils the predominant layout as 15×22.5 m distributed across the twelve sampled wards, including seven LGA. Then, 30×30 m is distributed across eleven wards, including six LGA. Finally, 10×10 m is distributed across ten (10) wards, including seven LGA. However, the stumpy layouts, 7.5×10 m and 8.5×15 m, were both found in one ward and LGA each. Then, 12×12 m is distributed across two wards and two LGA. The 15×22.5 m and 30×30 m have sufficient road networks in grid patterns, whereas stumpy layouts have poor accessibility routes.

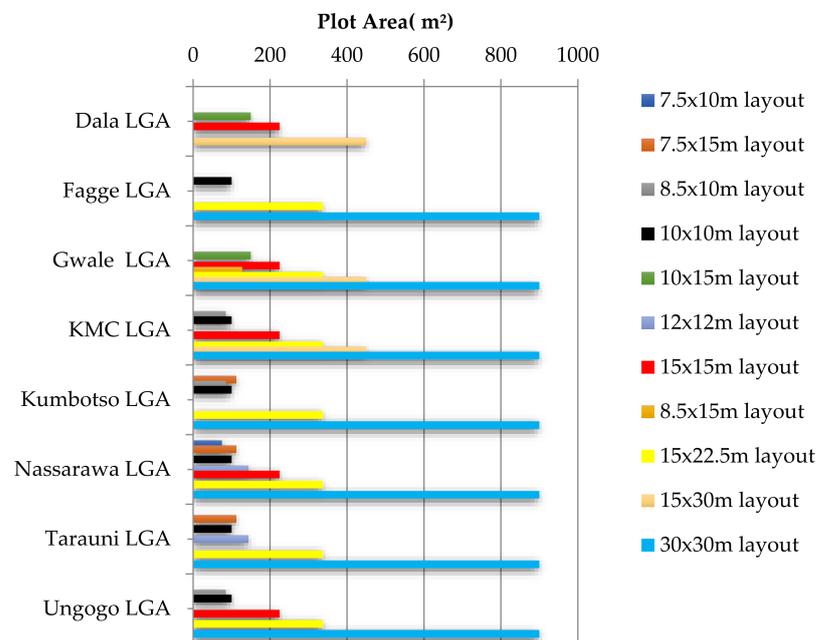


Figure 3. Kano Metropolitan embodied layout typology. Source: Authors, 2023.

- i. In the Dala local government area of Kano Metropolis, Dala ward has an organic and partly gridded arrangement with quite traditional Hausa–Fulani dwellings. However, Kofar-Mazugal ward has a squatter slum with partly traditional Hausa–Fulani dwellings.
- ii. The Fagge local government area, Kano Metropolis, comprises Fagge ward with a partly gridded layout and contemporary dwellings, and Jabba ward with a grid and partly irregular layout, as well as contemporary with a few traditional dwellings.
- iii. The sampled wards in the Gwale local government area are Gwale, which has an organic and partly gridded layout with traditional Hausa–Fulani dwellings, although transformed over time, while Dorayi/Kabuga has a gridded and partly irregular layout with contemporary dwellings.
- iv. In Kano Municipal local government area, Kano Metropolis, Sharada ward has a gridded and partly organic layout with contemporary dwellings, whereas Yakasai ward has an organic and partly gridded layout with traditional Hausa–Fulani dwellings.
- v. The sampled wards in the Kumbotso local government area are Challawa, with a squatter slum and traditional Hausa–Fulani dwellings, and Kumbotso, which has a gridded and partly organic layout with contemporary and partly traditional Hausa–Fulani dwellings.

- vi. In the Nassarawa local government area of Kano Metropolis, wards such as Dakata/Kawaji/Badawa have a gridded and partly “Awon-Igiya” (Squatter slum) layout in the company of contemporary dwellings with partly ghetto settlements. On the other hand, Hotoro ward has a gridded and partly “Awon-Igiya” layout with contemporary and traditional Hausa–Fulani dwellings.
- vii. The sampled wards in the Tarauni local government area are Babbangiji/Darmawa/Hausawa which have an organic and partly gridded layout with contemporary dwellings. On the other hand, Unguwa Uku has a gridded and partly ghetto/contemporary outline with few traditional dwellings.
- viii. The Ungogo local government area constitutes Bachirawa ward, with an organic and partly gridded layout and contemporary dwellings, and Ungogo ward, which has a predominantly “Awon-Igiya” (ghetto) and partly gridded pattern and traditional dwellings with contemporary settlements.

Additionally Figure 4 unveils the embodied residential layout pattern within the sampled wards. Where 15×22.5 m were the most predominant plot sizes observed in 12 wards followed by 30×30 m and then 10×10 m across the eight metropolitan local government. The 7.5×10 m is the least appeared residential plot size found in a single Ward within Nassarawa Local government. See Figure 4.

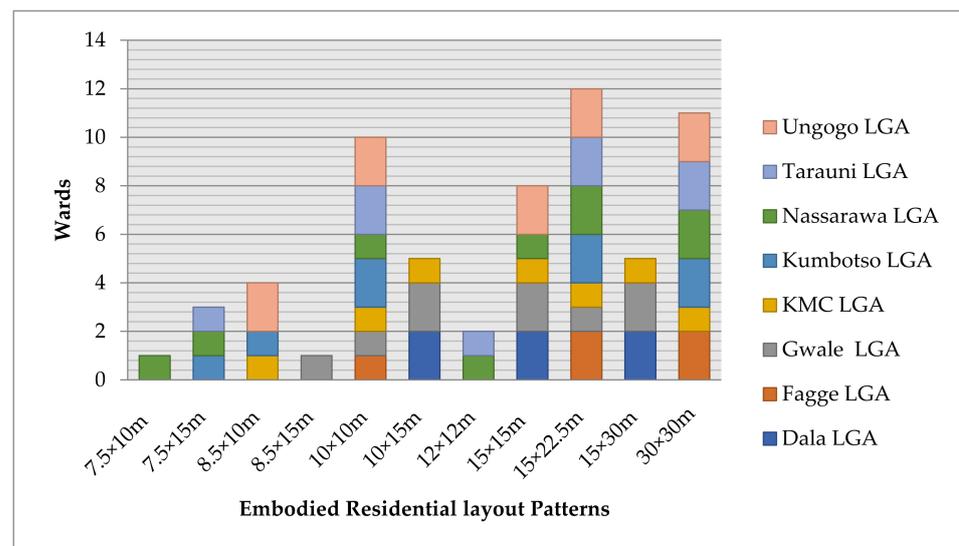


Figure 4. Embodied residential layout pattern of plot sizes across eight metropolitan local governments. Source: Authors, 2023.

4. Discussion

According to [52], “there is a batch of infilling proceeding and external extension into bordering townships. Metropolitan Kano has been redefined vide Edict No. 15 of 1990. By the edict, Kano metropolitan area comprises of all territory within the radius of 32 kilometres from Kurmi market. Accordingly, the metropolis embraces Dala, Fagge, Gwale, Kumbotso Municipal, Nassarawa, Tarauni, and Ungogo Local government areas and fractions of Dawakin Tofa, Gezawa, Kura and Rimin Gado Local government areas”.

Developments in the 21st century have incorporated adjoining hamlets such as Tokarawa, Fanisau, Ladanai, Medile, Yan-kunkuru, Yan-shana, Sabuwar Gandu, Baici and Limawa into the urban Kano and transformed it into a metropolis. Consequently, study shows that the landscape typology in the city of Kano can be dated back to the 15th century with the expansion of the city wall, and then, later, in the 16th and 17th century, respectively. In early 1900s, it was dominated by the British colonial administration, which comprises the space within the wall and the adjacent settlement just outside it. The reason for the

transformation began with the inheritance by descendants of the deceased compound head, weather, and wealth. Subsequently, population congestion and relocation schemes, constructions and the establishment of industrial infrastructure played their role in the metropolitan transformation.

Furthermore, it further unveils that the model of planned landscape, when applied to an urban space, should not be confused with the ideas of townscape or cityscape which carry the specific connotation of buildings, streets, trees and gardens as elements of the city landscape. It should neither be confused with a city planner's setting as revealed in maps and descriptions that are generally very specialized and professional views of what should or might come to be an urban landscape. Nevertheless, the city of Kano, "Binrin Kano", is an undisputed case study of the evolution of a walled Hausa–Fulani city for the reason that so much of its urban landscape can be correlated with traditional typology, although further mapping and evaluation with frequent transformation is required. The urban landscape of Hausa cities in recent times has also gone through some alteration, from the cluster of cultural mythology to an Islamic and then a British colonist landscape configuration, as well as due to regional development policies.

More so, this study reveals that the physical forces of nature shape the landscape. As such, landscape is forced by these natural forces modified by human intercession. However, landscape is not under a human's bearing or control and can be unpredictable as well. Yet, a third set of forces is attentive planning structures which the landscape in the land defines as the designed landscape. Table 9 alphabetically summarizes the Kano metropolitan urban landscapes within the sampled wards.

Table 9. Summary of urban landscapes within the sampled wards.

S/No.	Local Governments	Ecological Landscapes	Cultural Landscapes	Scenic Points
1.	Dala	Yan Awaki/Maitatsine house, market, "Kudidifi" (water pond), graveyard and abattoir (Mayanka)	Old City Wall and Gate (kofarruwa), Koki Zawiyya, Masaka Textile Factory (Gwammaja), Dala Hill, Yankilishi, Alfanda and Madabo settlements	Alhassan Dantata house, Federal Secretariat, Dala Orthopaedic Hospital, GGSS Dala, building material market (KofarRuwa)
2.	Fagge	"Kudidifinwafa da na hajji camp" (water pond), "Kwakwaci" green matrix, graveyard and "Kwakwaci" flooded and eroded plain	"kofofinFagge" (the gates) and "Dandali"	Kano hajj camp, "kwari" textile market, Kano guest-in, hospitals (M. Jidda and IDH) Masallacin Jumm'a, police station and courts, military base/barracks and Aminu International Airport
3.	Gwale	GoronDutse Hill, "Kudidifi's" (water ponds), the 'Haures' (Wanki, Shanu, etc.), graveyards, etc.	Dorayi mini palace, Old City Wall and Gates (Dan Agundi, Na'isa, Gadon Kaya, Fanfo, etc.)	Goron Dutse Prison and Galadanci Mosque, FCE Kano, Kabuga underpass, the pedestrian bridge by BUK old site and "Jan Bulo".
4.	Kano Municipal		"Rimi" market, "kofarNassarawa", GidanMa'aji, old city wall	Investment House (Gidan Ado Bayero), "Gidan Murtala", Sharada industrial estate, zone 1 police station, recreational facilities, religious places, "K. Nassarawa" (fly-over, fire service and MTD surveillance towers)
5.	Kumbotso	River Kumbotso, River Challawa, water treatment plant		Dangwauro" Economic City, Sa'atuRimi College of Education, residential estates (Kwankwasiyya, Amana and Almukab City) and some industrial expansion.

Table 9. Cont.

S/No.	Local Governments	Ecological Landscapes	Cultural Landscapes	Scenic Points
6.	Nassarawa	Fruit and vegetable market, "Bakindogo" graveyards		NNPC mega station, Sani Abacha bypass, residential estates (Ladanai and Tinshama), industrial estate (Bompai industrial expansion) and rail roads. Religious places and some oil/gas filling stations.
7.	Tarauni	Yan Awaki Market (unguwauku)		Aminu Kano Teaching Hospital, NNPC Depot, NNDC Quarters and Masallacin Murtala.
8.	Ungogo	Fanisau Hill	Fanisau mini Palace	Former NRC secretariat (Bachirawa Hospital), police outpost, GTC Ungogo, Kano free trade zone, religious places and filling stations.

Source: Authors Field Work, 2023.

From the foregoing, it is clear that the governance of cultural and ecological landscape is in very bad shape due to the dreadful conditions of Kano ecological landscape, which includes the backfilling of some water ponds ("Kudidifin Kukkuɓa", "Kudidifin Mai Allo", "Kudidifin wafa", "Kudidifin Pandaudu", "Kudidifin Mammaga", and so forth), the under utilizing of Fanisau and Dorayi farm house and the vanishing of "Maitatsine" House to Yan Awaki market. In addition, the deterioration of Kano cultural landscape includes the degradation of the old city wall; the Dan Agudi to Kofar Fanfo link (Gwale), opposite S.A. Stadium (Yakasai), etc.; the gradual washing away of Dala Hill; and the re-building of city gates using concrete.

Although ref. [15] shows that landscape transformation in Kano city can be dated back to the 15th century, the expansion of the city wall was in the 16th and 17th century, respectively. Yet, it is worth noting that the historic urban forms in Kano seem to be degrading with time, or are rather not on the course of sustainability; this is because the physical environment is consistently modified to satisfy the immediate needs of the communities.

5. Conclusions/Way Forward

Based on the foregoing, this study could be said to have achieved its aim, as it has explored the historical establishment and landscape assets and layout typology of some residential environments within Kano metropolis. Even though it was carried out in some sampled wards, the research presents a valuable tool that would help the people of Kano and government agencies in the revitalization of its distorted urban landscape forms and planning typologies. However, in order to effectively utilize its findings to preserve and restore the Historic Urban Landscape, the following recommendations are offered:

1. On implementing planning programs and development controls, it is recommended that unhealthy development should be discouraged and responsible government agencies should meet its expectations of controlling and regulating urban development, including the formal practice of land allocation, land acquisition, building codes, design, planning and construction.
2. Landscape architects should be part and parcel of planning programs and development schemes.
3. Integrating techniques for evaluating landscape values, problems and potentials should involve special protection and optimization measures for the urban landscape according to the current development.

4. Increase in awareness at all levels (community, local and state levels) for protection, conservation and revitalization of historic landscapes and cultural heritage. This will aid the government and people in the state to redefine urban landscape forms.
5. The government should also consider the implementation of the 2011 UNESCO proposals on the successful mapping of Historic Urban Landscape; it is a flexible activity that embeds policy, public involvement, economic empowerment conservation and building partnerships with relevant stakeholders.

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