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SPATIAL DISTRIBUTION AND POTENTIALS OF ECOTOURISM RESOURCES IN KANO STATE, NIGERIA

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ABSTRACT: This study examines the geospatial distribution of 51 major ecotourism resources in Kano. The coordinates of the ecotourism resources were collected via the hand-held Global Positioning System Garmin eTrex H and the data obtained were related to their geographical locations and attributes. Data pertaining to the potential of ecotourism resources were collected via a checklist, interviews and observations at each site and were analysed via SPSS version 17.0. The results of the analyses indicate that the spatial pattern of ecotourism resources is a dispersed pattern and that most ecotourism resources are very poor owing to the locational characteristics of rural areas where limited infrastructure development has occurred. The provision of adequate facilities through public-private partnerships at each destination should be encouraged by incentivizing rural people to establish the facilities needed for the promotion of ecotourism and the provision of adequate and qualitative road networks that make a site more attractive.

Keywords: Ecotourism, GIS, Infrastructure facilities, Resources and Tourism

INTRODUCTION

Tourism, which involves sightseeing, leisure and relaxation (Ajala & Aliu, 2013) has been a social phenomenon known to man since the dawn of history and has become one of the most important contemporary global issues, being among the largest industries that have contributed to the socioeconomic growth and development of many countries (World Tourism Organization/WTO, 1998; Amal, 2013). This industry, according to Stephen (1998), has prompted the regular mass migration of people, the exploitation of resources, processes of development and inevitable repercussions for places, the economy, societies and environments. When properly managed, it could contribute to the achievement of sustainable development goals (SDGs), particularly those concerning poverty alleviation, environmental conservation, and the generation of employment opportunities for indigenous communities and young people (Aser & Dulce, 2011).

Tourism resources are scattered over space and need to be unified into harmonious and systematic units for easy planning and management purposes (Abba, 2007) and their integration would definitely enforce integrated development in the locales of these resources (Ajala and Aliu, 2013). Kano State is blessed with a number of ecotourism resources ranging from hills, rock formations, water bodies, forest reserves and zoological gardens, which, if properly developed, would improve the socioeconomic status of the state, ensure sustainable tourism development and be able to market itself as a tourist haven.

Many studies have been carried out in Kano State in the area of tourism, such as Magaji (2006), who appraised the implementation of tourist camp projects through comparisons between the objectives of the project and what has thus far been achieved. Barau (2007) also assessed the landscape of the southern part of Kano for recreational and tourism development via fieldwork and focus group interviews. Abba (2007) investigated the tourism potential of Rurum in the Rano local government area to examine the resources that were already developed and those that have the potential to be developed via survey techniques. Zubair (2011) and Suleiman (2012) examined the development, challenges and prospects of domestic tourism and the potential of the Durba cultural festival as a viable tourism product via survey techniques. Suleiman (2014) appraised the Implementation of the Kano Comprehensive Tourism Master Plan. Muhammad (2018) assessed the accessibility of ecotourism resources in Kano State, Nigeria; Ahmed and Muhammad (2018) examined tourism resource decay in Kano State; and Muhammad and Lambu (2018) analysed the potential of tourism and hospitality in terms of employment generation in metropolitan Kano State, Nigeria. All these studies did not focus on the spatial distribution and potential of the ecotourism resources in Kano State to integrate tourism-related information, visualize complex scenarios, present ideas and derive effective solutions (Al qeed, Bazazo, Hasoneh, & Al qaid, 2010).

The aim of this study is to examine the geospatial distribution of ecotourism resources by taking an inventory of existing ecotourism resources and determining their potential for market demand in the tourist community.

Research Objectives

The objectives of this study are, to:

i. examine the spatial patterns of distribution of ecotourism resources in Kano state
ii. determine the potential of infrastructure facilities of ecotourism resources in the study area.

Location and Aerial Extent

Kano State lies approximately between Latitudes 10^0 30^I N and 12^0 37^IN of the Equator and Longitudes 7^0 40^IE and 9^0 23^I E of the Greenwich Meridian. It has an estimated land size of 20,280 km^2 (National Bureau of Statistics, 2010) with a population of 9,401,288 (2006 census). It is approximately 900 kilometers from the edge of the Sahara Desert, and some 1,140 km away from the Atlantic Ocean. The state shares boundaries with Jigawa state from North and East; from west to southwest, it borders Katsina and Kaduna states, respectively. From the extreme southeast, it borders Bauchi state. The state is made up of forty-four (44) local government areas (LGAs) (Figure 1).

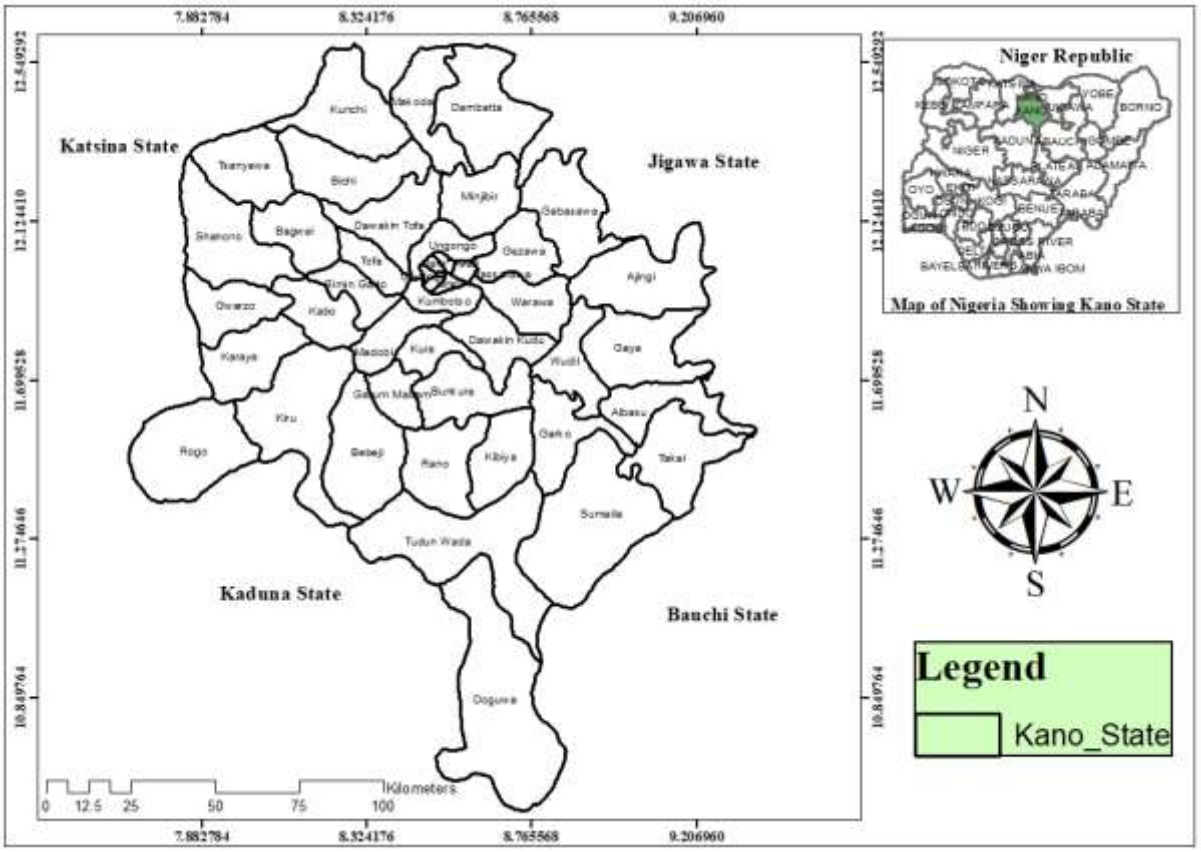

Figure 1. Kano State (Study Area)

The area is characterized by rocks of the basement complex of pre-Cambrian age to the west and south and the Chad Formation to the northeast. The relief can be described into three types, which are found in three zones. These include the southern and southeastern highlands, the middle and western high plains and the northeastern low Chad plains. The first two types are part of the high plains of Hausa land, and the third is part of the Chad plains (Olofin, 2008). The geologic process of pediplanation has made it possible for older granites to give way to flat terrain or simple plainlands in this area, whereas the pockets of hills around Kano are merely residual beacons of natural washing (Barau, 2006). This allows the area to house ecotourism resources that are easily accessible.

The climate of the study area is the tropical dry-and-wet type, which is classified by Koppen as Aw. The movement of the intertropical discontinuity (ITD) gives rise to two seasons (wet and dry seasons). The wet season lasts from May to mid-October, with a peak in August, whereas the dry season extends from mid-October of one calendar year to mid-May of the next. The commencement and length of the wet season varies between the northern and southern parts of Kano State. In extreme South, the value can reach 1200 mm per annum around Riruwai and Doguwa (Liman, Idris, & Mohd, 2014), and the length of the season in Riruwai is six months from early May to late September, whereas in northern Kano, it is from June to early September (Kurawa, 2006). The mean annual rainfall is between 800 mm and 900 mm, and variations in the mean annual values reach ± 30%. The mean annual temperature is approximately 26°C (Olofin, 2008). The mean annual evapotranspiration, sunshine, and relative humidity are approximately 1,772 mm, 8.5 hours per day and 50%,

respectively. However, these values fluctuate as one moves away from the metropolis. The temperature, sunshine and evapotranspiration increase northwards, whereas the rainfall and relative humidity increase southwards. Thus, Olofin (1987) stresses that, on the basis of the general effects of climatic controls and the temporal variations in rainfall and temperature conditions around Kano and its environment, Kano has not only dry and wet seasons, as is commonly believed but also four seasons: dry and cool seasons (kaka), dry and hot seasons (bazara), wet and warm seasons (damina) and dry and warm seasons (rani).

The vegetation of Kano State is semiarid savannah. The Sudan savannah is sandwiched by the Sahel savannah in the north and the Guinea savannah in the south. In the pre-industrial age, the savannah was described as the zone that provides opportunity for optimal human attainment. This occurred because it is rich in faunal and floral resources, it is suitable for both cereal agriculture and livestock rearing, and the environment is relatively easy for the movement of natural resources and other goods.

With these features, Kano State stands out as an excellent destination whose vast ecotourism resources beg to host a large number of tourists. In fact, it is among the best places to be while in Nigeria because of its abundant attractions and medieval atmosphere (Barau, 2007). However, despite these glamorous and potential tourism resources that the state has, only a small number of these products are developed and explored by both the government and private individuals, which allows them to remain untapped and/or not patronised.

MATERIALS AND METHODS

This research adopted a survey design conducted in all the sampled ecotourism destinations of the state. The total number of existing ecotourism sites included in the Kano State Tourism Master Plan of 2007 is fifty-one (51), and all the attractions were selected as the subject of the study to obtain a good and clear perspective of the ecotourism resources in the state.

Different types of data, which were obtained from a variety of sources, are needed. The data pertaining to the inventory of the ecotourism resources of the state were sourced from the Kano State Tourism Board (KSTB), which was used to collect their coordinates via the hand-held Global Positioning System (GPS) Garmin eTrex H and map their distribution pattern. The primary data were obtained through a checklist and were complemented with observations at each of the ecotourism resources for the assessment of their potential.

The ecotourism potentials of the infrastructural facilities were analysed via SPSS version 17.0 to observe the potentials available at each centre from the checklist on a scale of 0--5 (very good, 5; good, 4; moderate, 3; poor, 2; very poor, 1; absent, 0), referred to as the "Tourism facility Index". The total scores obtained from the overall rating scale were analysed to determine the level of infrastructure facilities available at each site, which determines its potential or otherwise. The mean infrastructure scores were used for determining the overall level of potential within the ranges of 1.00–1.99 (very poor), 2.00–2.99 (poor), 3.00–3.99 (moderate), 4.00–4.49 (good) and 4.45 and above, indicating very good infrastructure development. This method was employed and modified from Imikan and Ekpo (2012) in their studies of Infrastructure and Tourism Development in Rivers State.

RESULTS AND DISCUSSION

Spatial Patterns of Distribution of Ecotourism Resources in Kano

Kano State is endowed with numerous ecotourism resources, ranging from water bodies, rock formations, forest reserves and zoological gardens for booting and recreational purposes to scenic beauty for sightseeing and different rock formations and game viewing. Because of the scenic importance of the resources in the state, Barau (2007) and Abba and Rilwanu (2018) described the area as a place where the outstanding shape of rock formations is spectacular in physical appearance and looks to kiss the sky.

The result of the general distribution of the ecotourism resources in Kano shows that the general pattern of the distribution does not appear to significantly differ from the dispersed pattern given the nearest neighbour ratio of 1.12, the Z score value is 1.68, and the p value is 0.09 (Figure 2). The general pattern of all the destinations is random, as all the resources are distributed across the sampled local government areas, where there is no single sampled local government area that has no ecotourism (Figure 3). The findings of the study contradict the findings of Song, Wang, and Meng (2023) on the spatial pattern of the tourism landscape in cities in the Yangtze River Economic Belt, where the result of the spatial pattern is less than 1 and shows a cluster pattern.

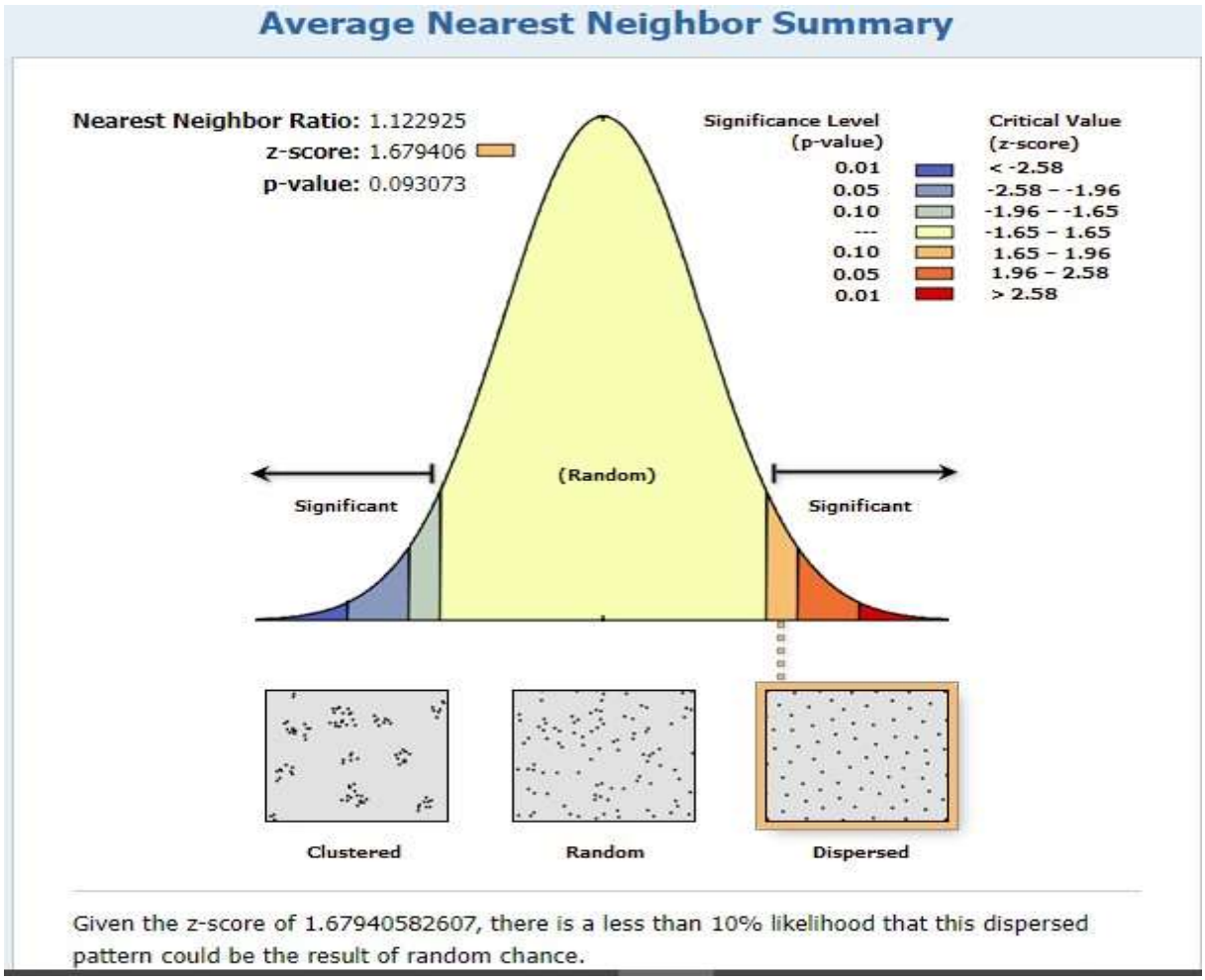

Figure 2: Distribution of ecotourism in Kano.

This pattern coincides with Tobler's "first law of geography", "everything is related to everything else, but near things are more related than distant things" (Tobler, 1979), which explains the relationship between the distance phenomena and the closest phenomena, which are in clustered use to have similar relationships or characters. Hence, research on spatial clusters could reveal information about the underlying geographical process that generates the spatial pattern, which can further aid in the comprehension of the underlying geographical process and its relationship with the phenomenon under investigation.

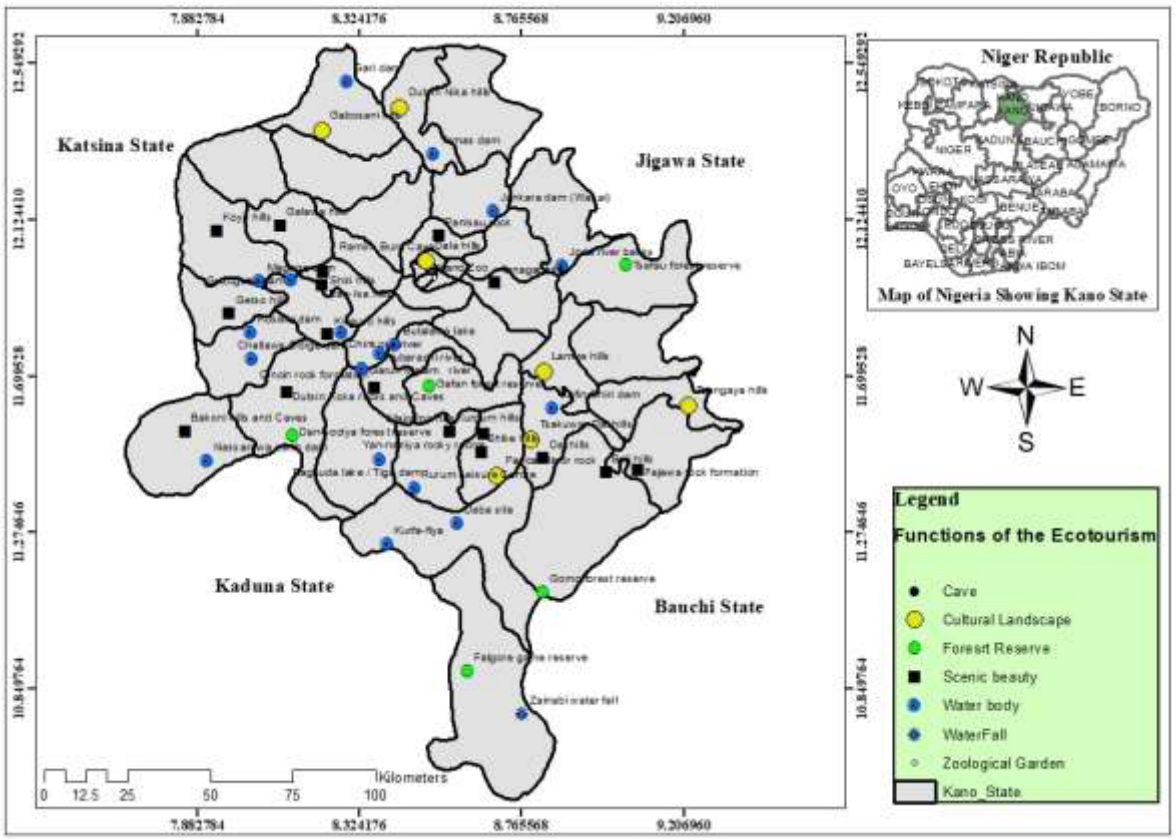

Figure 3: Ecotourism Resources

The majority of the ecotourism resources shown in Figure 3 indicate that the majority of the ecotourism resources found in the state dominated the southwest and were weakly concentrated in the northeast.

The findings of the study contradict the findings of Zhang, Han, Tang and Chen (2023) on the spatial distribution characteristics and driving factors of tourism resources in China, where their results show that tourism resources are strong in southeastern China and weak in northwestern China. The availability of ecotourism resources in these areas allows them to enjoy good rocks for scenic beauty, waterfalls, and dams for recreational festivities as well as forest reserves for game viewing. The variation in ecotourism in Kano state occurred as a result of the availability of basement complex rocks of pre-Cambrian age, which produce different pockets of hills and watersheds of the Kano River (Figure 3) in the western and southwestern parts of the state, which characterize the area as part of the high plains of Hausa land (Olofin, 2008).

Potentials of infrastructure facilities

The results presented in Table 1 indicate that the Garko local government area has the greatest number of ecotourism resources, which include water bodies and hills for scenic beauty. The study revealed that most of the ecotourism resources in Kano are very poor (90.2%), and only a few (5.88%) of the centres have moderate potential to meet market demand (Table 1). This indicates that the majority of the ecotourism resources in Kano state, especially those in rural areas, lack adequate facilities, such as transport, electricity, communication, accommodations, food services and souvenir shops, to compete with market demand and consequently affect the level of ecotourism development in the state.

As shown in Table 1, 46 out of the 51 identified ecotourism resources have very poor potential to attract tourists. Most of the resources found to be very poor are located in the rural areas of the state in the North, Northeast, East, Southeast, South–West -West and Western parts of the state, where different pockets of hills and watersheds of the Kano River are found (Figure 4).

Table 1: Facilities' assessment of ecotourism resources in Kano State

S/N	Name of Tourism Resources	L.G.A	Mean	Potentials
1	Tsangaya hills	Albasu	0.94	very poor
2	Galawa hills	Bagwai	1.00	very poor
3	waire war hills	Bichi	0.88	very poor
4	Tsakuwar Dal hills	Garko	1.12	very poor
5	Dal hills	Garko	1.12	very poor
6	Lamire hills	Garko	0.94	very poor
7	Cincin rock formation	Garun Malam	0.82	very poor
8	Getso hills	Gwarzo	1.29	very poor
9	Kwauro hills	Kabo	0.71	very poor
10	Fanca Mirror rock	Kibiya	0.82	very poor
11	Shike hills	Kibiya	0.82	very poor
12	Yan-naniya rocky rooms	Kibiya	0.82	very poor
13	Dutsin Koka rocks and Caves	Kiru	1.06	very poor
14	Dutsin Nika hills	Makoda	1.00	very poor
15	Kurgum and Mairama hills	Rano	0.88	very poor
16	Mairama hills	Rano	0.88	very poor
17	Dan-Isa hills	Rimin Gado	0.71	very poor
18	Shiri hills	Rimin Gado	0.71	very poor
19	Bakuni hills and Caves	Rogo	1.00	very poor
20	Koya hills	Shanono	0.82	very poor
21	Baji hills	Sumaila	1.06	very poor
22	Fajewa rock formation	Takai	1.12	very poor
23	Tanagar hills	Warawa	0.88	very poor
24	Bagauda lake / Tiga dam	Bebeji	1.12	very poor
25	Zainabi water fall	Doguwa	1.00	very poor
26	Joda river banks	Gabasawa	0.88	very poor
27	Kafin Chiri dam	Garko	0.76	very poor

28	Garun Malam river	Garun Malam	0.88	very poor
29	Guzuguzu dam	Kabo	1.00	very poor
30	Magaga dam	Kabo	1.18	very poor
31	Challawa Gorge dam	Karaye	1.18	very poor
32	Kusalla dam	Karaye	1.18	very poor
33	Gari dam	Kunchi	1.00	very poor
34	Butalawa lake	Kura	1.00	very poor
35	Kubarachi river	Madobi	0.88	very poor
36	Chinkoso river	Madobi	0.71	very poor
37	Tomas dam	Makoda	1.24	very poor
38	Rurum Leisure Centre	Rano	0.82	very poor
39	Nassarawa earth dam	Rogo	0.71	very poor
40	Kurfa-fiya	Tudun Wada	1.41	very poor
41	Daba site	Tudun Wada	0.71	very poor
42	Tsafau forest reserve	Ajingi	1.12	very poor
43	Gafan forest reserve	Bunkure	1.12	very poor
44	Falgore game reserve	Doguwa	1.65	very poor
45	Dan-sociya forest reserve	Kiru	0.94	very poor
46	Gomo forest reserve	Sumaila	1.65	very poor
47	Dala hills	Dala	2.12	Poor
48	Jankara dam (Wasai)	Minjibir	2.47	Poor
49	Panisau rock	Ungogo	3.18	Moderate
50	Ramin- Bura Cave	Ungogo	3.18	Moderate
51	Kano Zoo	Kano Municipal	3.24	Moderate

Source: Field work 2015

Although these areas enjoy good rocks for scenic beauty, waterfalls, rivers/dams for recreational festivities and forest reserves for game viewing, the insufficient and poor nature of the roads as well as other tourism facilities available in these areas render them very poor potential. These findings coincide with the results of Raouf (2022) on the characterization and spatial distribution of ethno-cultural tourism resources in Kaduna State, Nigeria, where the problems of accessibility to resource areas and abandonment of many ethno-cultural tourism resources affect the potential of these resources.

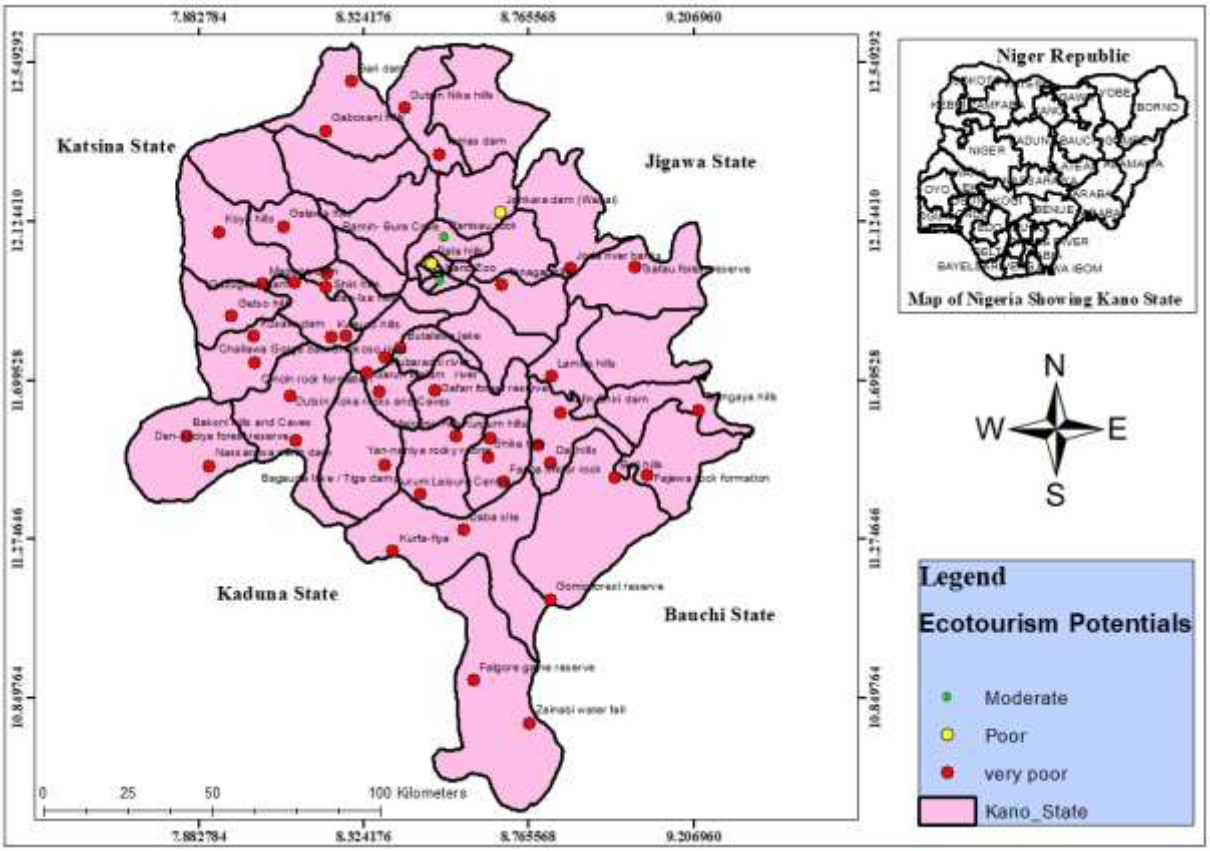

Figure 4: Potentials of ecotourism resources

The importance of accessibility and tourism facilities cannot be ignored in tourism development. In view of this, Imikan and Ekpo (2012) stated that transportation, communication, accommodation and electricity jointly contribute significantly to tourism development in Nigeria. This is because tourists always feel at home while at the destination.

Within urban Kano, Ramin-Bura Cave, Panisau Rock (Ungogo local government) and Kano zoological garden located in Kano municipality have moderate facilities to meet market demand. This occurred as a result of their location in urban Kano, where the facilities needed to promote tourism, such as accommodations, catering services, good roads, hospitals, securities and the market, are found. As posited by Ogechi, (2005) and Bassey (2012), the interrelated functions of such facilities offer tourists experiences that, without them, ecotourism cannot thrive. Thus, for an ecotourism resource to flourish and promote economic growth and development, it must have good facilities around it that may influence the choice of the tourist.

Conclusion and Recommendations

This study provides ecotourism maps for states that provide different information to tourists. The study revealed dispersed patterns in the distribution of ecotourism sites. The majority of the ecotourism resources of the state are potentially very poor enough to meet market demand because of the insufficient and poor nature of the infrastructural facilities around the sites to attract tourists from different parts of the world.

Following the findings and limitations of this study, the following recommendations were made:

i. The government, the private sector and individuals should focus on developing ecotourism resources and should investigate their characteristics and identify their scientific and cultural values. This attracts more tourists to destinations and, in turn, has multiplier effects on residents, generating more revenue for the government.
ii. The provision of adequate facilities through public–private partnerships at each destination should be encouraged by incentivizing rural people to establish the needed facilities, such as hotels, restaurants, soft drinks shops, and suya spots, which would make a site more attractive. This will assist in reducing the poverty level of rural dwellers and reduce rural–urban migration.

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