



## ACCESSIBILITY OF ECO-TOURISM RESOURCES IN KANO STATE- NIGERIA

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### ABSTRACT

This study examined ecotourism resources in Kano State in order to determine which tourist sites are more accessible in the state for sustainability. The data for the study were obtained from primary and secondary sources. Fifty-one (51) major ecotourism resources were used in the study. The coordinates of the tourism resources were derived using handheld Global Positioning System Garmin eTrex H and the data obtained were related to their geographical locations and their attributes. Accessibility of the tourism resources from tourist transit camp was determined in the Geographical Information System (GIS) environment. ArcGis 10.3 version and descriptive statistical tool were used for the analysis of the data obtained. The study revealed that, Kano Zoological garden has the shortest distance of 8.0 km, while the longest is 201.98km at Riruwai mining site. However, the Zainabi water fall has the highest travel time of 236.92minutes from tourist transit camp, while Kano Zoological garden has the lowest travel time of 9.6 minutes being close to tourist transit camp. The study recommended that good and qualitative road network that would link tourism destinations should be given consideration in the state. Kano state government, tourism related private sector and individual (s) should gear up towards developing ecotourism resources through investigating their characteristics with the aim of recommending suitable sites to tourist(s) in order to diversify the economy of Kano.

**Key Words:** Eco-tourism, Accessibility, Tourist, Transit Camp and GIS

### INTRODUCTION

Tourism is a social phenomenon known to man since the dawn of history. This phenomenon has passed through several stages in the history of evolution and even in its current form it has become one of the most important contemporary global modern phenomena (Amal, 2013). It is one of the largest and fastest growing industries (Yan & Jie 2015) that depended on the nature and quality of road network in order to play an important role in promoting its economic development. Statistics from World Tourism Barometer show that the International tourist arrivals grew by a remarkable 7% in 2017 to reach a total of 1,322 million and it is expected to continue with strong momentum in 2018 at a rate of 4%-5% (United Nation World Tourism Organization, 2018). This makes the industry to account for 9.5% of total gross domestic product, one in 11 of the world's jobs, 5.4% of world exports, as well as 4.4% of global investment (World Travel and Trade Council, 2014). This makes the industry over the years to prove to be the strong and resilient economic activity by generating billions of dollars in exports and creating millions of jobs to many nations (Muhammad, 2017).

Acknowledging these facts, many developing and developed countries today rely on tourism as an option for sustainable development of their nations (Yusuff & Akinde, 2015). Fundamentally, the



impacts of tourism on the economy can be connected to the influence of good and qualitative road network over a destination. That is why many countries including Nigeria, take development of transport system as an instrument for the promotion of national development as well as effecting desirable social change. In fact accessibility of tourism resources depends to the large extent on the availability of good quality road network to deliver, operate and manage at best competitive advantage. As pointed out by Lamb & Davidson (1996), that transportation is crucial in the tourism industry, as it connects to supply (production) and demand (market) directly. This is because the role of transportation in tourism is essentially to provide accessibility by providing ability to tourists to reach destinations (Truong & Shimizu, 2017).

It has been widely observed by Chew (1987) and Prideaux (2000) that without accessibility, tourism simply cannot take place. These accessibility factors influence tourists' impressions during their trip, and serve as determining factors of the destinations' overall attractiveness (Le-Klähn & Hall 2015, Page & Connell 2014, Boopen 2005). Road networks are observed in terms of its components of accessibility, connectivity, and traffic density, level of service, compactness, and density of particular roads (Olawale & Adesina, 2013). However, the impact of road networks connectivity system to a tourist destination explains how people travel and why they choose different forms of destination (Page & Lumedon, 2004). Generally, accessibility is used to measure the spatial interaction and the performance of the transportation system (Handy & Kelly, 2001) and also reflects the extent of interaction between an area's land development patterns and transportation supply modes that can be used to identify areas with low accessibility (Bhat, 2000). This perhaps, might be responsible for the growing concern of stakeholders in the tourism and transportation industry on the effect of transport systems as well as its implication on the overall development of tourism industry. In essence, access to road networks provides advantages upon which tourist destination can be easily located and enjoy high level of patronage relative to others. Thus, as stated by Dragan & Cocean (2015) that improved viable access road determines an increasing number of tourists that require improved infrastructure and services, resulting in the growth of the tourism phenomenon in the destination.

To compete in today's tourism market; places with pleasant road network attract more tourists and the tourism industry with substantial implications for both spatial and temporal redistribution of tourism activities.

Kano is blessed with abundant eco-tourism potentials across the state that is expected to be linked with good roads which shall be the movement corridors for the tourists (Kano State Tourism Master Plan, 2007). Despite with all these potentials tourism resources in the State, only small part of these products are accessible as a result of poor transport network that criss crossed the sites which make them to remain untapped and or un-patronage (Muhammad, 2017).

It is on the basis of this, that this study attempt to assess the accessibility of the location of tourism resources in order to access which tourist location or locations have potential to meet market demand in the State for sustainable tourism development.

## THE STUDY AREA

The study area, Kano State lies approximately between latitudes  $10^{\circ} 30^{\prime}$  N and  $12^{\circ} 37^{\prime}$  N of the Equator and longitudes  $7^{\circ} 40^{\prime}$  E and  $9^{\circ} 23^{\prime}$  E of the Greenwich Meridian. It has an estimated land size of 20,280 km<sup>2</sup> with a population of 9,401,288 (National Bureau of Statistics, (NBC), 2010). It is some 900 Kilometers from the edge of the Sahara desert and some 1, 140Km away from the Atlantic Ocean. The state shares boundaries with Jigawa state in the North and East, in the west and

southwest it borders Katsina and Kaduna states respectively. From the extreme south east it borders Bauchi state. The state is made up of 44 Local Government Areas (LGAs) (Figure 1.1).



**Figure 1: The Local Government Areas of Kano State**

The climate of the study area is the tropical dry-and-wet type with the mean annual rainfall of between 800 mm and 900 mm: and the mean annual temperature of about 26<sup>0</sup>C (Olofin, 2008). The mean annual evapotranspiration, sunshine, and relative humidity are about 1, 772mm, 8.5 hours per day and 50% respectively. Thus, the general effects of the climatic controls and the temporal variations in rainfall and temperature conditions around Kano and its environment give the state not just a dry and wet seasons as commonly believed, but four seasons, which are: dry and cool season (kaka), dry and hot season (bazara), wet and warm season (damina) and dry and warm season (rani) (Olofin, 2008). These variations of the seasons have significant control over tourists' movement. The impressive infrastructural facilities such as the Mallam Aminu Kano International Airport (MAKIA), road links to other parts of the country as well as the excellent road network within the state provide unique opportunities for the steady growth of commercial activities in the state (Kurawa, 2007).

## METHODOLOGY

This research adopted a survey design. The data for the study were obtained from primary and secondary sources. The population of the study consists of all the major fifty-two (52) eco-tourism resources identified by Kano state Tourism Master Plan (2007) which were selected as sampled of the study for convenience in order to have good and clear perspective of the accessibility of the

ecotourism resources in Kano. However, in the process of data collection only fifty-one (51) sampled ecotourism resources were in existence, which was used to collect their coordinates and their distances from tourist transit camp.

Lines were used to delineate road network and boundaries between the 44 Local Government Areas. Microsoft Excel was also used to record the data acquired from GPS of the attraction centers in tabular form which have different preparation in order to make them compatible with the software utilized for the analysis for easy exporting to *ArcGIS* 9.3 version for analysis, integration and presentation of the map.

In order to build the accessible road network, the road shape file of Kano requires further structuring using GIS. The quality of the road network was checked and was found not to be ready for use due to some error. This error was that the road networks in the study areas do not connect with all the tourism resources. To correct the roads/lines errors: the edit tool on the *ArcGIS* interface was used.

The road network was stored as series of lines/arcs in Arc Map GIS software and connected to each other at nodes. The nodes represented junctions or points where the road changed from one type to another (for example, from built-up areas to expressway).

To determine the accessibility of the ecotourism resources in relation to travel distance and time in Kano, distances in kilometers from tourist transit camp to all the eco-tourism resources were measured using the Arc GIS ruler. The drive time was calculated by dividing the road length in kilometers by the speed limit and multiplied by 60 which represents minutes.

The road network that links the ecotourism resources in Kano are classified into three categories (Built-up, Highway and Expressway) and each has a definite speed limit (Table 1.0). However, accessibility was examined to determine the distances from tourist transit camp (TTC) to any tourist sites using the Arc GIS ruler. This method was adopted from Aldakhil (2007) because it gives more accurate measure of the accessibility of tourist sites. Also, in determining the travel time in the study, all the roads were considered as traffic free from the tourist transit camp without considering any factor(s) that may hinder free flow of traffic to the destinations. This is because the road networks were already determined the Federal Road Safety Corps (FRSC) as shown in Table 1.0.

Table 1.0: The roads categories and types of vehicles speed limit in Nigeria

S/N	Types of Vehicle	Built-up	Highway	Expressway
(Average speed limit in Km/hr)				
1.	Motorcycles	50	50	-
2.	Private cars	50	80	100
3.	Taxis and Buses	50	80	90

**Source:** Modified from FRSC (2015)

The maximum speed limits for some roads that were found at the built-up areas which before reaching one must pass either Highway or Expressway were given the maximum speed in an equivalent road category of built-up areas. Network topology was built for the road features class and distance in kilometers from tourist transit camp to all the eco-tourism resource centers was



determined manually from the road network in the GIS environment. However, distance or road length was adopted as the impedance for this study and the drive time was calculated by dividing the road length in Kilometers by the speed limit and multiplied by 60.

Drive Time = length in Km / speed limits multiply by 60

$$\text{Travel Time} = \frac{\text{Length of arc (in KM)}}{\text{Average speed limit}} \times 60$$

This formula was adopted and modified from Lovett, Haynes, Sunnenberg, & Gale, (2000) and Aldakhil (2007) in their study.

## RESULTS AND DISCUSSION

### Accessibility of Eco-tourism Resources

The distance between eco-tourism resources from the tourist transit camp is uneven as shows in table's 2.0.and figure 2.0. The shortest distance from tourist transit camp is 8.0 km at Kano Zoological garden in the urban Kano while the longest is 201.98km at Riruwai mining site, where columbite, zinc, Tin, iron-ore and bauxite are mined and are largely untapped, found in the extreme end of southern Kano. This uneven distance and minutes between tourist transit camp (TTC) and the tourist destinations affects the choice of the destinations, travel behavior of the tourists in relation to his activity and duration of stay at the site. However, this relationship between travel distance and duration of stay was positively related to length of stay at destinations Silberman (1985) and that travel distances varied significantly across different trip patterns. Thus, the distance of tourism destination from the tourist origin or his place of residence determines destination choice by the tourist. Because choice of destination is largely controlled by distances which influence the cost of travel in relation to travel time, transportation, tourist guide allowance, tourist activity at the destination and access to tourism facilities and in turn affect the overall level of patronage. Because the closer the tourist destination with the tourist origin the less the cost of travel and attract more tourists and the greater the distance the higher the cost of travel and attract less tourist. Accessibility as highlighted in many studies such as Dietvorst (1995) typified not only the in-between places which may be visited en route, but also the short period of travel to get to destination.



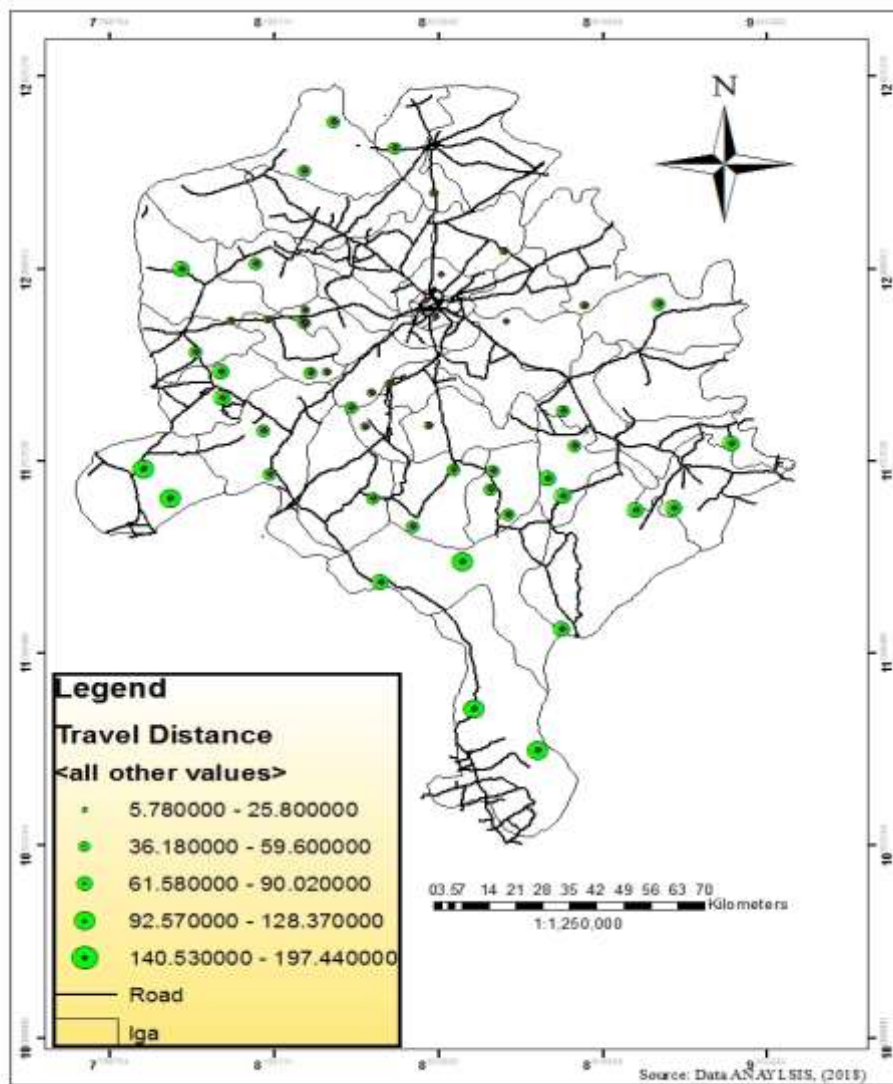


Figure 2.0. Distance in Kilometer from TTC to eco-tourism Resources

However, according Ming & McNally (1998) a location has not only spatial coordinates to accessibility but also time coordinates. Thus Aldakhil (2007) stated that, accessibility and sufficiency of services are considered to be fundamental elements in the development of tourism in any location around the world and affects tourist flows.

### Travel Time from Tourist Transit Camp (TTC) To Tourism Resources

The Travel times from tourist transit camp to tourist sites increases as one move away from the urban centre. The tourism resources (Zainabi water fall) of Doguwa Local Government Area and Nassarawa Earth Dam in Rogo Local Government Area have the highest travel time of 236.92 and 190.62 minutes respectively from tourist transit camp (table 2.0). To visit these sites, tourist (s) needs at least four (4) hours to reach zainabi water fall and three hours thirty minutes (3:30) to reach Nassarawa earth dam. While Kano Zoological garden (Kano Municipal Government Area) has the lowest travel time of 9.6 minutes being close to tourist transit camp.

Table 2.0 Accessibility of Ecotourism Resources

Tourism Resources	Name	L.GA	Distance (Km) From TTC	Travel Time In Minute	
<b>Ecotourism</b>					
A. Hills	Tsangaya hills	Albasu	105.37	9.21908	
	Galawa hills	Bagwai	72.47	86.964	
	waire war hills	Bichi	68.47	81.964	
	Dala hills	Dala	5.78	6.9	
	Tsakuwar Dal hills	Garko	101.7	122.04	
	Dal hills	Garko	95.12	71.34	
	Lamire hills	Garko	82.08	98.49	
	Cincin rock formation	Garun Malam	59.6	71.52	
	Getso hills	Gwarzo	90.02	108.02	
	Kwauro hills	Kabo	70.71	84.85	
	Fanca Mirror rock	Kibiya	83.53	100.23	
	Shike hills	Kibiya	72.37	86.84	
	Yan-naniya rocky rooms	Kibiya	67.16	80.59	
	Dutsin Koka rocks and Caves	Kiru	67.66	81.19	
	Dutsin Nika hills	Makoda	65.26	78.31	
	Kurgum hills	Rano	61.58	73.89	
	Maryama hills	Rano	61.58	73.89	
	Dan-Isa hills	Rimin Gado	41.18	49.41	
	Shiri hills	Rimin Gado	40.86	49.03	
	Bakuni hills and Caves	Rogo	140.53	168.63	
	Koya hills	Shanono	92.57	111.08	
	Baji hills	Sumaila	107.29	128.74	
	Panisau rock	Ungogo	14.5	17.4	
	Ramin- Bura Cave	Ungogo	14.5	17.4	
	B. Water	Bagauda lake / Tiga dam	Bebeji	77.47	58.103
		Zainabi water fall	Doguwa	197.44	236.92
Joda river banks		Gabasawa	45.16	54.19	
Kafin Chiri dam		Garko	68.9	82.44	
Garun Malam river		Garun Malam	65.26	78.31	
Guzuguzu dam		Kabo	48.77	36.57	
Magaga dam		Kabo	58.31	43.73	
Challawa Gorge dam		Karaye	122.65	91.98	
Kusalla dam		Karaye	102.2	122.64	
Gari dam		Kunchi	80	96	
Butalawa lake		Kura	36.18	43.41	
Kubarachi river		Madobi	45.2	54.24	
Chinkoso river		Madobi	41.9	50.28	
Tomas dam	Makoda	42.44	50.92		



	Jankara dam (Wasai)	Minjibir	55.84	41.88
	Rurum Leisure Centre	Rano	81.26	97.51
	Nassarawa earth dam	Rogo	158.85	190.62
	Kurfa-fiya	Tudun Wada	112.41	134.89
	Daba site	Tudun Wada	141.17	169.4
C. Forest	Tsafau forest reserve	Ajingi	81.06	97.272
	Gafan forest reserve	Bunkure	47.48	56.976
	Falgore game reserve	Doguwa	160.69	120.51
	Dan-sociya forest reserve	Kiru	75.22	90.26
	Gomo forest reserve	Sumaila	128.37	154.04
D. Animals	Kano Zoo	Kano Municipal	8	9.6

## Fieldwork (2015)

Thus, accessibility of tourism resources in relation to travel time gives more accurate measure of accessibility of tourist sites (Aldakhil, 2007) and is a major contributory factor that enhances good service delivery in any geographical space. Consequently, based on the table 2.0 only urban tourism resources appear more accessible than rural resources based on their location. This is simply because urban tourism have good road networks, in contrast to rural sites which dominated by poor and dilapidated road networks. This study agreed with the finding of Aldakhil (2007) in his study at Al-Qaseem, Saudi Arabia where the higher average of travel time to ecotourism sites may be related to their location outside the urban areas and the state of the road. Hence, this is attributed to lack of development plan to enhance the rural tourist attractions in Kano in general. However, Majority of the eco-tourism resources in Kano are found within the built-up areas where their speed limit is 50km per hour and only few are located on the Highway roads of the State and none of the resources were located on the Expressway figure 3. This makes the tourism resources in the state to be accessible and thus creating the possibility of attracting more people to visit the site.



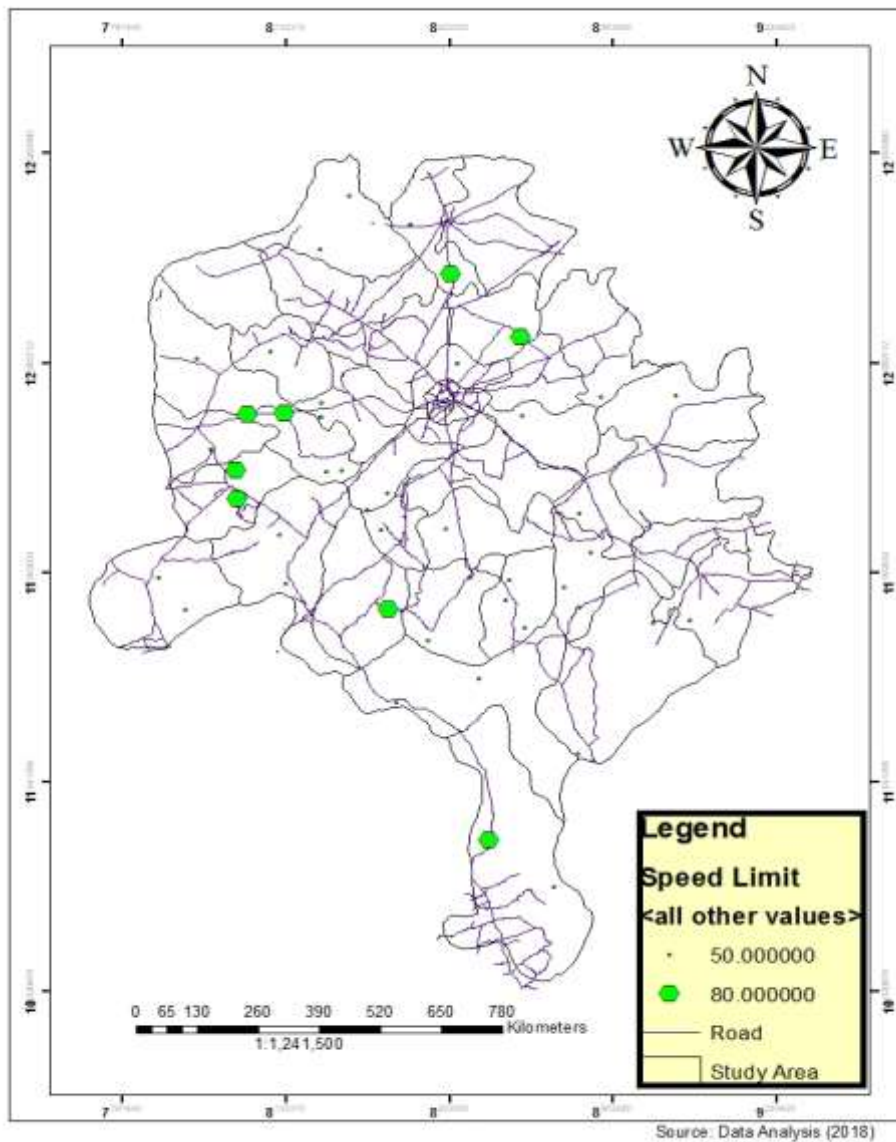


Figure 3: Speed Limit

## CONCLUSION AND RECOMMENDATION

### Conclusion

This research has covered some specific issues related to tourism resources in Kano State. It has dealt with issues of accessibility of the resources in relation to time to reach each destination from the tourist transit camp. Some of the important points reported in this study are; the tourism resources identified by Kano State Tourism Master Plan were no longer in existence such as Jinjir hills in Gaya local government area. The roads that lead to the some sites have a poor surface, which affects the accessibility; this is reflected in the low attention paid to rural areas. The travel time from tourist transit camp showed that the majority of tourist sites are located in the speed limit of 50km per hour. Also resources located within the central Kano can be accessed easily because of their short distance away from the tourist transit camp and as one move from the Central Kano the



travel time increases. Majority of the rural ecotourism resources in Kano lack adequate facilities to attract visitors because they are poorly served with transport than the other locations.

## Recommendations

Following the findings in this study, the following recommendations were made.

1. Kano State Government should employ the services of experts/professionals to undertake a thorough inventory of the existing eco-tourism resources of the state in order to come up with full eco-tourism database for proper management and planning as well as to make the resources available in the global market.
2. Good and qualitative road network that would link tourism destinations in Kano should be given consideration in the state. This will ease the transportation system and make the destinations to be more accessible. There is a need to develop information about the road network in Kano in an accurate and ready to use digital format for different costs (travel time or length and shortest path analysis) taking into account the location of each site. This will help to investigate issues related to the accessibility
3. There is need for the state government to partner with tourism related private sectors towards developing ecotourism resources that should involve investigating their characteristics with the aim of recommending suitable tourist sites in order to diversify the economy of the state.
4. There is need for the tourism professionals/experts to gear up towards identifying the scientific and cultural values of the eco-tourism in the state. This will attracts more tourists to the destinations and in turn provides multiplier effects to the residents and generates more revenue to the government.

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