Analysis of Spatial Distribution and Patronage OF Tourism Sites in Jos, Nigeria

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Abstract

Tourism exposes an area to growth and development. However, its distribution across space affects its utilization and patronage. This study focused on examining the spatial distribution of tourism sites and pattern of patronage of tourism sites in Jos. The list of tourism sites and annual patronage of tourist was collected from the Plateau State Tourism Board. Handheld Global Positioning System (GPS) receiver was used to acquire coordinates of the tourism sites and overlaid, on a georeferenced basemap of the study to show the spatial distribution in ArcGIS 10.4. Nearest Neighbour Analysis (NNA) was performed to determine the pattern of distribution of tourism sites while the time series analysis was also performed using annual patronage of tourist from 2000-2017 to show the pattern of patronage over the years. Results revealed that there are sixteen (16) tourism sites in Jos which are randomly distributed having a Nearest Neighbour Ratio of 0.010787 at 0.01significantlevel. It was also observed that the Jos North has 56% of tourism sites, Jos South, 25% and 19% in Jos East. Tourism sites patronage is not uniform, as it varies according to the uniqueness of the site. The peak of tourist inflow is mostly during the festive period and public holiday. The patronage pattern of the wildlife park, museum and zoological garden varies from year to year, due to the incessant crises experienced in Jos during the period of the study which affected the patronage of the tourism site. The study recommends that adequate tourism sites should be provided in built up areas of Jos South and Jos East so as to boost tourism activities. Existing tourism facilities should be improved or given a new face lift so as to boost the inflow of tourist from within and outside the state.

Keywords: Geographical information system (GIS), Patronage, Spatial distribution, Tourism, Tourism sites, Tourist.

Introduction

The tourism sector is one of the largest and fast growing global economic industries. It is a significant contributor to national and local economies around the world. It represents far

more than just travel for leisure and holidays. Tourism encompasses travel for education, health, religion, conventions and conferences, general business travel and visiting friends and relatives (World Travel and Tourism Council, 2014). (United Nation World Tourism organization [UNWTO], 2010) defines tourism as including: the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited. Tourism has been used as a tool to spur economic development, benefiting the environment and the local social condition without harming the environment. It plays a key role as a driver of growth and job creation, offering great potential for investment and tourism development (Anyebe, 2015). A tourist is also someone who satisfies the conditions of traveling at fifty miles from home for any period less than a year and that while they are away, they spend money in the place they visit without earning it there (UNWTO, 2010). Tourism site is a designated permanent resource controlled and managed for the enjoyment, amusement, entertainment and education of the visiting public. It is a physical or cultural feature of a particular place that individual travellers or tourist perceive as capable of meeting one or more of their specific leisure-related needs. Such features include climate, culture, scenery or specific location such as wildlife or museum (Medlik, 2003). A tourist may visit two or more tourism site or tourism support facilities depending on its proximity and distribution over space.

Spatial distribution is the quantitative study of phenomena that are located in space. It has become relevant and influential in the field of tourism, transport studies, urban and regional planning, regional development, peripheral areas etc (Hall, 2012). The spatial distribution of tourism sites across an area has great impacts on the behaviour of tourist and the increase or decrease of the services. Tourist cost will increase if there is considerable distance between tourism site, it is worthy of note that tourism facilities have the greatest economic impact in the tourism industry (Issa and Marrie, 2014). Tourism activities happen at a location and knowledge of the spatial data can help in development plans of any tourism destination or tourism resources. Spatial approach to tourism activities gives a detailed explanation to travel trends, tourist-flow, impacts (Nepal, 2008) and the level of patronage.

Patronage is the business that comes into an establishment generating revenue. It can also be seen as business or activity provided by a patron. The business or activities provided by patrons (tourists) in a destination are expressed in the number of visits over time (Bitrus, 2014). Patronage can come in the form of customers, other businesses or companies; it can also be seen as business or activity provided by a patron. The patron in a tourism context refers to the tourist who patronizes a destination of tourist sites. The facilities, attractions

and publicity of a destination affect its patronage. Patronage pattern is the frequency of visits and the temporal visits to tourism sites. Tourism patronage is determined by factors like availability of infrastructures, security, economy and the popularity of the tourist site (Suleiman, 2011). Tourism development is the positive transformation of tourism potentials of tourism products such as attraction, accessibility, accommodation and transportation (Okoli, 2001). Most of the time, tourism development is based on the availability of natural settings that can be explored and developed to ensure patronage of people for economic viability (Meseko, Obeje and Oksana, 2018).

Tourism studies had a number of problems due to the paucity nature of data. However, with the introduction of Remote Sensing and Geographical Information System (GIS), data is now available for effective research on the subject matter. GIS offers opportunity for managing variety of information needed in the tourism industry. GIS provides the link between spatial data and attribute data, referring to non-location data associated with spatial entity. The use of Remote Sensing and Geographic Information System in tourism enhances the desired outcome for developing maps for tourist, tourist web-based services and offer valuable tools to support decision making for sustainable tourism planning and development (Kyriakou, Hatris, Kapsimalis, Sourianos and Vandarakis, 2017). Jos is endowed with a wide range of natural and cultural resources that serve as tourism sites. Its tourism resources are widely distributed in almost all parts of the study area (Okoli, 2001). It is blessed with favourable weather, good topographic scenes and with a number of places for relaxation, education and experience (Ijeomah, Alarape and Ogogo, 2003).

Obong, Ajake, Aniah, Ukam and Uttah (2015) examine the spatial distribution of attraction and tourism institutions in southern Cross River State, Nigeria. Nearest Neighbour Analysis was adopted to determine the distributional pattern. It was observed that tourism attraction and institutions are randomly distributed in the study area. The randomized spatial pattern of attraction in the study region represents a huge opportunity to increase the number of attractions and tourism institution in order to increase the activity base of the destination.

Bitrus (2014) analyzed patronage characteristics of tourism destinations in Jos. Questionnaire survey was also used to determine the most important and performing tourism component in the study area. The result shows that tourists were young adults and mostly males. On average tourists stayed in Jos for 1-7 days for adventure, leisure or educational purposes mostly during festive season and public holiday. It was also discovered that attraction is the most important performing component. Tourism sites are distributed across the area, however their distribution pattern and patronage are not known.

This paper is focused on examining the spatial distribution of tourism site using GIS techniques as well as the level of patronage to tourism sites.

Description of Study Area

The study area is Jos North, Jos South and Jos East Local Government Areas (LGA) of Plateau State, Nigeria. Jos is the capital of Plateau State, located between latitudes 09º 5' N and 09º 21' North of the Equator and between longitudes 08º 53' E and 09º 53' East of the Greenwich Meridian (fig. 1). It is bounded to the North by Bauchi State, Kaduna State to the West and the lower parts of Plateau State to the South. It has an area of 26,899 square kilometres. It is 303km from Yola, 350km from Minna, 245km from Abuja and 332km from Kaduna. It has a total population of 836,910 with a growth rate of 2.5% (NPC, 2006) and projected to 1,138, 197 by 2019. Jos has a heterogeneous population. The Berom, Afizere, Anaguta are the indigenous people with small proportion of Igbo, Yoruba, Hausa, Idoma, Tiv and other ethnic groups. The climate of Jos is characterized by two distinct seasons (wet and dry). The rainy or wet season is between April and October while the dry season is between November and March. The annual rainfall is 1324mm^3 with a mean annual rainfall of 127mm^3, the wettest month of the year is July and August (Bitrus, 2014). The Temperature ranges between 11ºC during the Harmattan to 31ºC during the peak of the rainy season. The relative humidity ranges from 30% between January and March to 90% during the rainy season with a mean relative humidity of 60% (Katsa, 2015). The vegetation of Jos can be classified within the northern guinea savanna due to its peculiar location and high altitude, open woodland with tall trees and mainly short trees. The tall trees are found at the foot of the plateau with short grasses at the summit. Vegetation provides a conducive environment for tourists as it normalizes the temperature and water cycle in the study area. The geology is associated with the Precambrian basement complex rocks of northern Nigeria. The predominant rocks are mainly granites, gneiss and migmatities which are less resistant to weathering (White, 1983). The soils are largely ferruginous tropical soil, which eroded from basement complex and sedimentary rocks. The soil in Jos and its surroundings are more fertile because of alluvial deposits. The unique physical feature of Jos is high relief, especially in the North (Dashen, 2015). The high relief provides a hydrological centre for many rivers in northern Nigeria and confers on the northern part of the State, it rises steeply from 200m around the plains of river Benue in the south to an average height of 120m on the Jos Plateau. The drainage system of Jos, is radial and is the source of numerous rivers including the Kaduna, Karami and N'gell which feed the Niger River; River Mada, River Ankwe, River Dep, River Shamankar and River Wase which flow into the Benue. The plateaus steep, irregular southern slopes have many

waterfalls, notably among them are the Gurara falls (Odunga and Badru, 2015). The major occupation of the inhabitants of Jos ranges from farming, trading and civil service. The major crops grown by the farmers include maize, irish potato, soya beans and different varieties of vegetables at both commercial and subsistence levels.

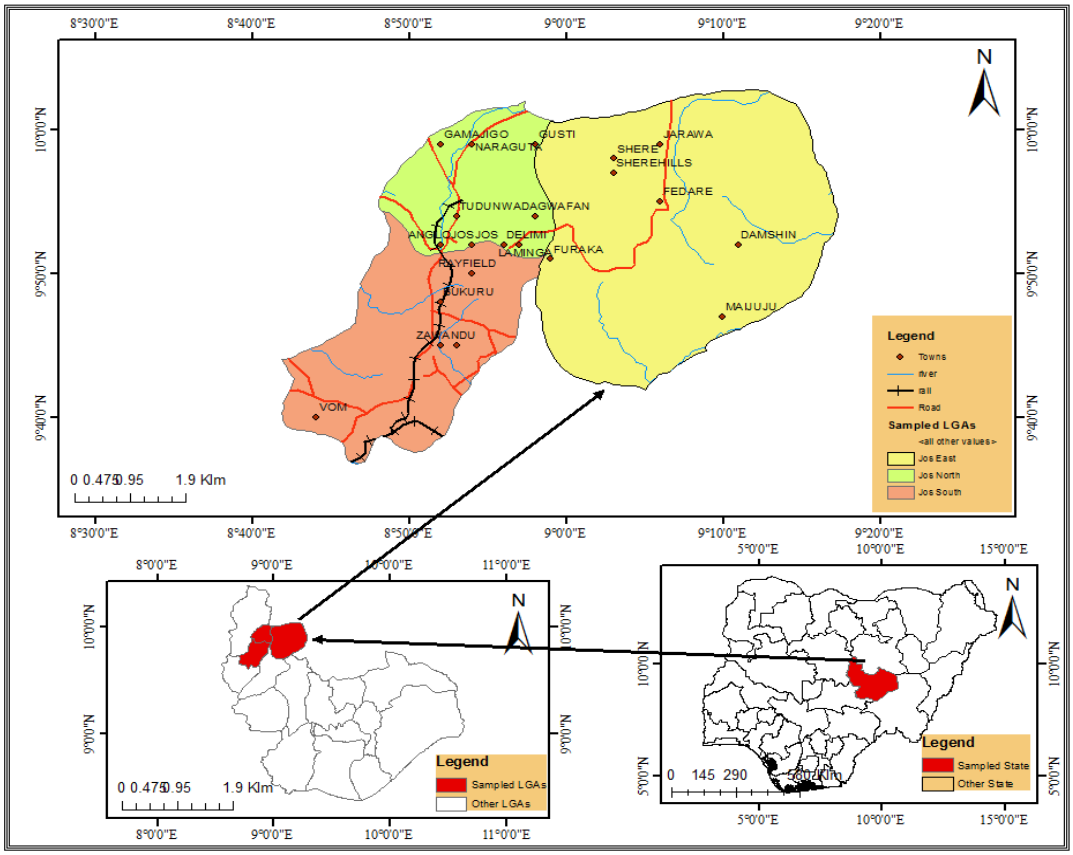

Fig 1: Map of the study area
Source: Adapted from the Administrative Map of Nigeria (2018).

Materials and Methods

Data Types and Sources

The list of tourism sites and annual patronage of tourist was obtained from the Plateau State Tourism Board. Geographic coordinates of tourism sites was obtained through a comprehensive field survey using handled Garmin 20 GPS. Administrative map of the study area was scanned, imported into ArcMap environment of ArcGIS 10.3 overlaid on the google earth image of Jos and then geo-referenced using map to image georeferencing

method. The three Local Government Areas North, Jos East and Jos South were used as reference points for the georeferencing. The georeferenced map was auto rectified and then given the same coordinate with the image using Universal Transverse Mercator (UTM) Global Coordinate System (GCS) projection of 32N datum. UTM systems were chosen because it is in metric units and has the capacity to enable the researcher calculate the length, distance and other measurements that may not be possible with geographic coordinate system. Two shape files were created in ArcCatalog environment and given same coordinate system with the map and image. The shape files were later imported into the ArcMap environment and used to digitize the base map of Jos, which was also used subsequently for result presentations. The coordinates and their attributes were copied from the score sheet and a GPS device into Microsoft Excel 2016 environment and then saved as CSV (comma delimited) format. The point locations of tourism sites and hospitality were imported into the ArcGIS 10.4 environment and overlaid on the georeferenced basemap of the study area. This shows the distribution of the tourism sites in the study area. Time series analysis was used to show the pattern of patronage over the years. Time series are observation assumed by a variable over successive time periods. Time series analysis helps to fit an array of time bound data on a line of best fit. It helps to show the type of existing trends in the data graphically.

Results of the Findings

Spatial Distribution of Tourism Sites

The result of the findings revealed that there are sixteen (16) tourism sites in the study area namely Naraguta Leather Works, National Museum, Museum of Traditional Architecture (MOTNA), Mado Tourist Village, Lamingo Dam, Lamingo Golf Course, Rayfield Resort, Mega Parks, Eslee Garden, Wildbunch Parka and Garden, Zoological Garden, Amurum Bird Sanctuary, Wildlife Park, Solomon Lar Amusement Park, Shere Hills and Angware Waterfalls. It was also observed that the Jos North has 56% of tourism sites, Jos South, 25% and 19% in the Jos East (Table. 1). The tourism sites are not evenly distributed within the Local Government Areas (LGA).

Table 1.: Distribution of Tourism Sites in the Study Area

LGA	Number of Tourism Sites	Percentage
Jos North	9	56
Jos South	4	25
Jos East	3	19
Total	**16**	**100**

Source: Author's Analysis (2019)

There is higher concentration of tourism in Jos North being that it is the city center of the state and it attracts more tourist influx. Jos East have fewer number of tourism sites as it an emerging Local Government Area and most of the tourism potentials are yet to be tapped and explored.

Locational distribution of tourism sites across space is a major determinant of its patronage and its utilization. The accessibility and patronage of tourism sites is also dependent on its location. The spatial locations of tourism sites were plotted on the base map of the study area to show the extent of the distribution of the tourism sites as shown in fig 2. From fig 2, it can be clearly seen that the distribution of tourism sites in the study area is not even.

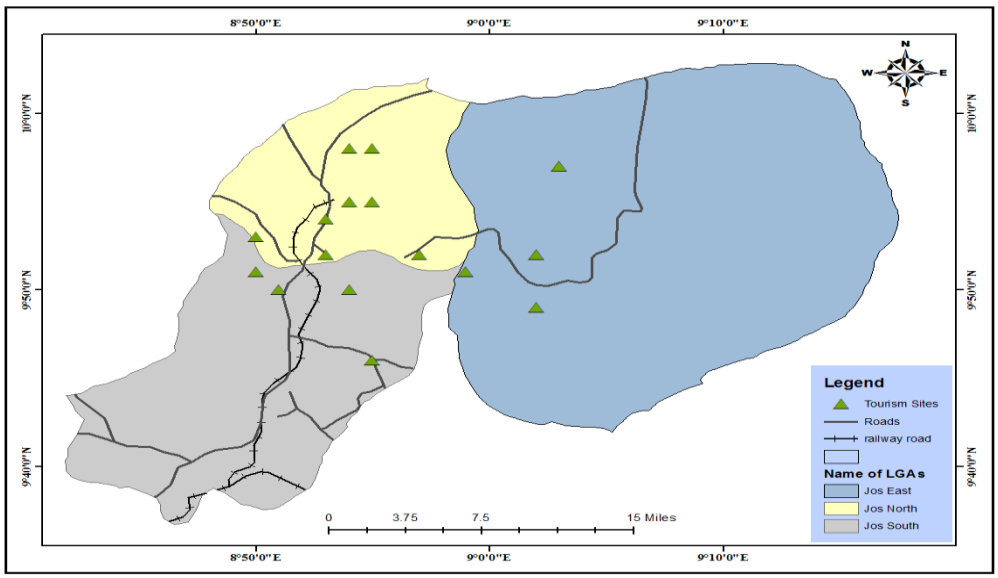

Fig 2: Locational Pattern of Tourism Sites
Source: Author's Analysis, (2018).

The results of NNA show a random pattern at 0.01% significance level with the Nearest Neighbour Ratio (NNR) of 0.010787. Given the Z-score of 0.908719 which is very close to 1 and falls within the range of -1.65 to 1.65 indicates a random distribution pattern.

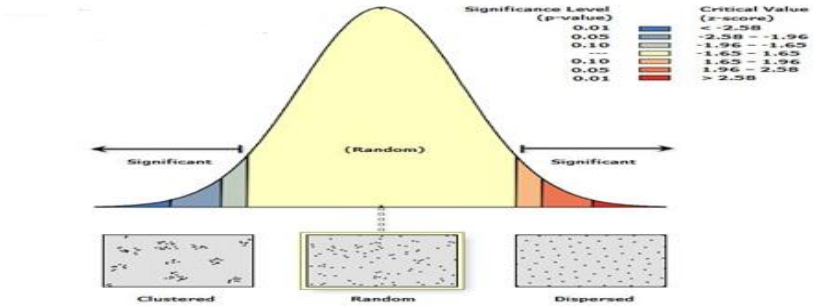

Fig 3: Spatial Pattern of Tourism Site
Source: Author's Analysis (2019)

It can be clearly seen that the pattern exhibits random points. The random spatial spread of tourism sites in the study area is to ensure accessibility across the space which increases patronage. The random spatial pattern of tourism sites in the study area increases the patronage of tourism sites as a result of spatial spread of population. However, this is dependent on distance between tourism sites and residence of patrons.

Table 2. Average Nearest Neighbour Analysis for Tourism Sites in the Study Area

Observed Mean Distance	2441.7568 Meters
Expected Mean Distance	2759.6947 Meters
Nearest Neighbour Ratio	0.884792
Z-Score	-0.881601
P-Value	0.377992

Source: Author's Analysis (2019)

The result agrees with the work of Obong, Ajake, Aniah, Ukam and Uttah (2015), where the researchers noted that random spatial pattern of tourist attractions provides a huge opportunity to increase the activity base of the destination by achieving spatial homogenous distribution of population over the city. However, the agglomeration of tourism sites provides the business area with benefits such as cheaper labour and power and increased patronage.

Patronage of Tourism Sites

Level of Patronage at Wildlife Park

Patronage is the frequency of visit of tourists to the tourism sites. The patronage pattern at wildlife park from 2000-2017 is presented in fig 4. It shows the total number of tourists for each of the tourism sites from 2000 to 2017. It could be observed that the patronage at Wildlife Park was marked with variability from year to year.

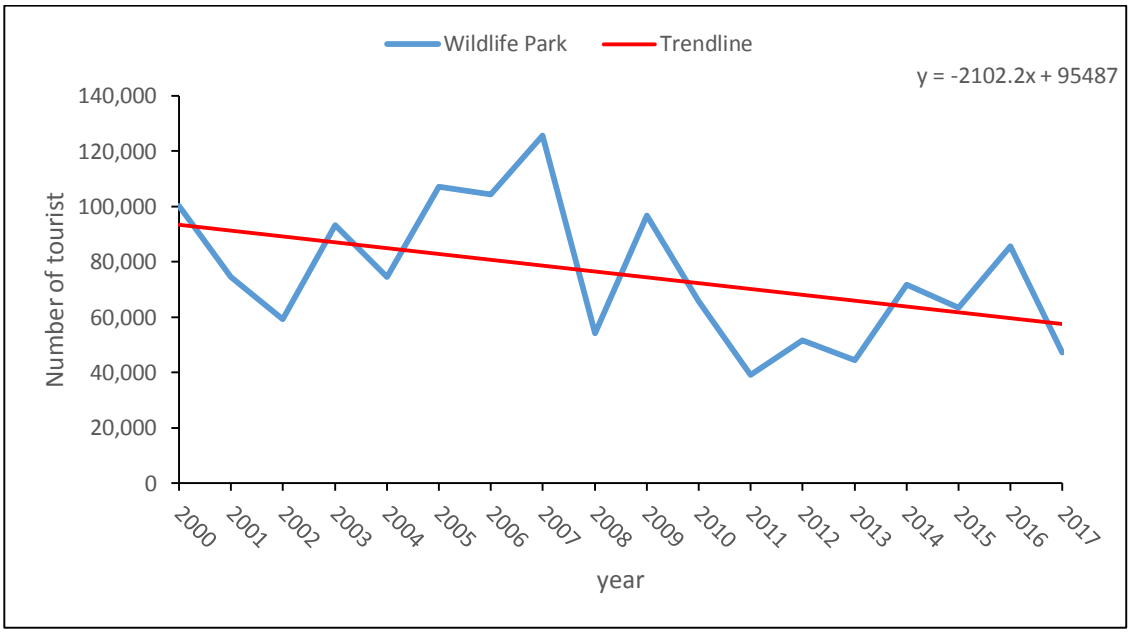

Fig 4: Level of Patronage at Wildlife Park
Source: Authors Field Analysis (2019)

It was observed that wildlife park enjoyed highest patronage in 2007 with an average of 125,636 tourist and lowest patronage in 2011 with an average 39,188 tourists. The linear trend line equation (Y= -2102x + 95487) is showing negative; meaning that wildlife park experienced a decrease in patronage during the study period. It also showed that there was a steady decline in the patronage of the Wildlife Park from 2008 till 2014. This could be linked with the incessant crises experienced in Jos during the period. Frequent clashes led to the loss of lives of many people, thus it affected the patronage of the tourism site. It could also be observed that 2015, 2016 and 2017 experienced higher figures than the previous years of 2008-2014. This could be attributed to the stability of the area, less ethno-religious crises, better economic growth and better security in the state thus, patronage of tourist improved during this period.

Level of Patronage Pattern at Museum

The patronage pattern at the museum from 2000-2017 is presented in fig 5. It could be observed that the patronage at the museum is also quite variable from year to year. The lowest patronage was recorded in 2010 with 21,975 tourists while the highest of 374, 815 tourists was recorded in 2009. It also showed a steady decrease between 2001 to 2017. Again, this period is known for increased communal and ethno-religious crisis in the study area. This may have led to the decrease in the number of patrons of tourism sites. The linear trend line equation (Y= -5557x + 184144) is negative which implies that the museum experienced a steady decrease in the number of tourists during the period of study.

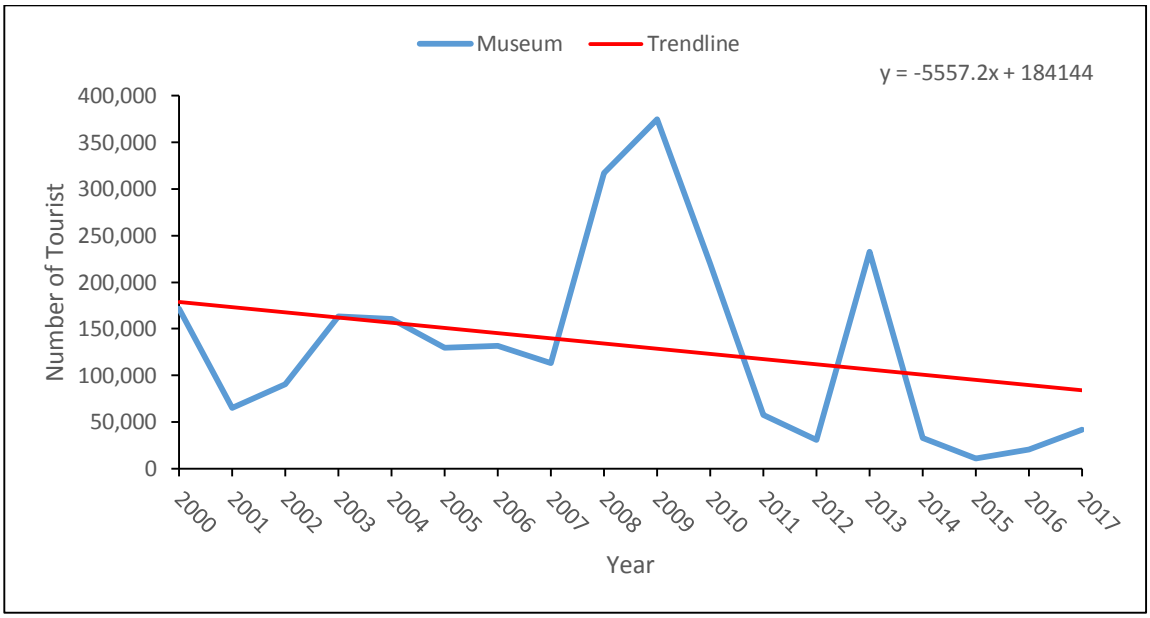

Fig 5: Patronage Pattern at Museum
Source: Authors Field Analysis (2019)

Although, location and income can lead to variation in patronage, the variation in the patronage of tourism sites can also be dependent on the uniqueness of the tourism sites which informs tourist choice and destination.

Patronage Pattern at Zoological Garden

Furthermore, the level of patronage of zoological garden for the period of study was recorded and shown in fig 6 with the high patronage of 108,882 tourists in 2007 and lowest of 32,669 in 2014.

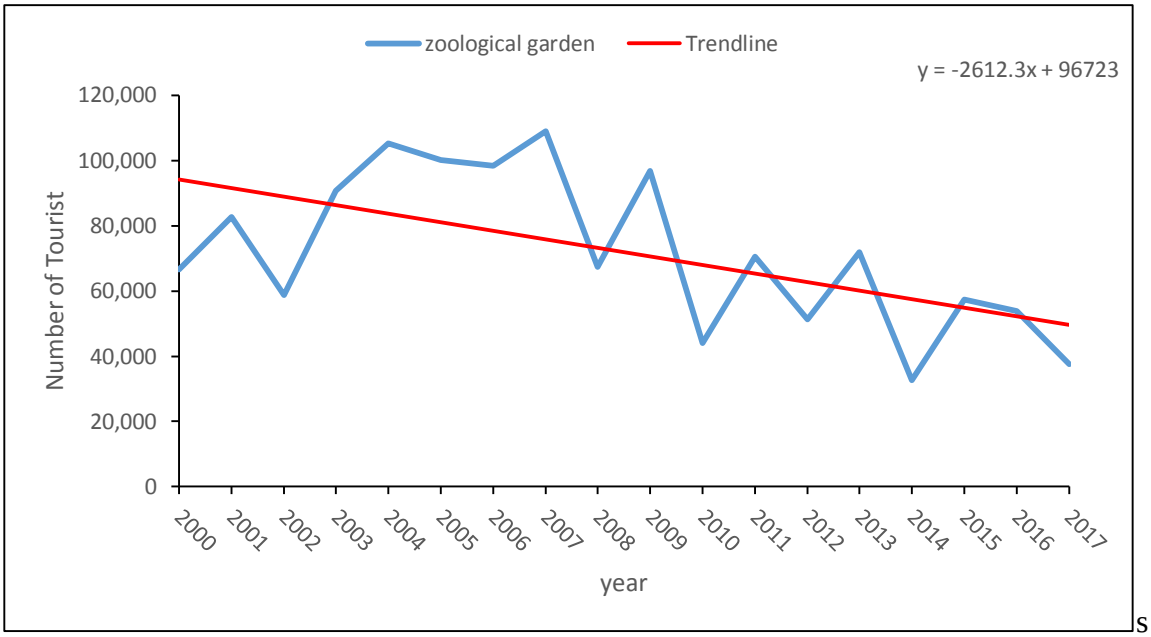

Fig. 6: Patronage Pattern at Zoological Garden
Source: Authors Field Analysis (2019)

The linear trend line equation (Y= -832.06x + 14679) is negative meaning that zoological garden experienced decreases in the number of tourists during the period of study. This reason for this decline is the already established economic hardship and insecurity situation in the study area as a result of ethno-religious and communal clashes.

Conclusion

In conclusion, Jos is an area blessed with abundant tourism potentials with unique tourism attractions of younger granite which was intruded through an area of older granite rocks given Jos unusual scenery. Based on the findings of the study, it was observed that the spatial distribution of tourism sites is unevenly distributed in the study area. Locational distribution of tourism sites across space is a major determinant of its patronage and its utilization. The accessibility and patronage of tourism sites is also dependent on its location. It was also observed that tourism patronage varies according to the uniqueness of

the site, the peak of tourist inflow is mostly during the festive period and public holiday. Patronage pattern of wildlife park, museum and zoological garden varies from year to year, due to the incessant crises experienced in Jos during the period of the study which affected the patronage of the tourism site. The study recommended the following, adequate tourism sites should be provided in built up areas of Jos South and Jos East so as to boost tourism activities.

Recommendation

Existing tourism facilities in the area should be improved or given a new face lift so as to boost the inflow of tourist. Secondly, the Plateau State Tourism Cooperation and Ministry of Tourism should provide a comprehensive database system for tourism sites and features of tourism sites so as to provide holistic information about its assets. This will equally be of great help in terms of decision making.

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