Time Series Analysis of Tourist Patronage in Esie Museum, Esie Kwara State, Nigeria

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Abstract- The flow of Tourists is usually not uniform. They vary according to nature of the tourism site, amenities and infrastructures available, services, security and awareness. Therefore, it is essential to evaluate the tourist patronage in other to explore the relationship between tourism site and level of patronage. The objective of this study was to analyse tourist patronage in Esie museum. Data on monthly flow of tourists were obtained from 2010 to 2024 from Esie Museum. Zaitum Time series decomposition method and Seasonal index were used in the data analysis. The result of the analysis shows that the dispersion characteristics of tourist patronage is high and there is differential pattern in the number of tourist patronage. The result also revealed that the number of tourist patronage exhibit an increasing trend. The seasonal index for period 1 (January), 8 (August) and 12 (December) shows an above average seasonal effect while the seasonal indexes in the periods 2 (February), 10 (October) and 11 (November) show a below average seasonal effect of tourists' patronage. In term of percentage, the seasonal index indicates that tourists' patronage in period 1, 8 and 12 are 2.14%, 7.14%, and 41.76% respectively while patronage in periods 2, 10, and 11 are 22.60%, 8.10% and 16.45% respectively. These results imply that there is an increase in tourists' patronage in Esie museum from 2010 to 2024. Therefore, the study recommends that both the government and other stakeholders should continue to improve the amount of satisfaction derived from Esie Museum through the provision of modern amenities and improved services to enhance tourist patronage.

Keywords- Tourism, Tourists, Patronage, Time Series, Seasonal.

I. Introduction

According to World Tourism Organisation, WTO, (1993) Tourism comprises of activities of persons traveling and staying in places outside their usual environment for not more than one consecutive year for leisure, business, and other purposes. It is the temporary movement of tourists from their home to another place for a minimum period of twenty-four hours to a maximum of twelve months for the sole purpose of leisure, business, pleasure and other purposes. Tourism encompasses travel for education, health, religion, conventions and conferences, general business travel and visiting friends and relatives (World Travel and Tourism Council, 2014).

Tourism has been universally recognised as one of the largest and fastest growing sector and a major contributor to national and local economies globally (Lengnen, 2020). It is also one of the main items of international trade (Bassi and Alfred (2018). Tourism plays a fundamental role as a driver of growth (Anyebe, 2015). It is an economic activity that promotes economic growth in both developed and developing countries (Akighir, 2017).

Tourism is closely related to economic sectors. The tourism industry is a key backbone of the economy, making important contributions in providing employment, reducing poverty, boosting infrastructural investment, and promoting economic development (Hassan, et. al. 2017). According to (Organización Mundial del Turismo 2020) it is predicted that for every direct job produced in tourism, an additional 1.5 jobs are indirectly created in other economic sectors. Aulia and Iqbal (2023) also reported that tourism is one of the significant and vibrant sectors to support the manufacturing economy industry. Tourism is an instrument of economic regeneration and stability, therefore, if rightly harnessed; it has the ability to create wealth, empower the people and generate employment opportunities (Okoli,2014).

The fundamental feature of tourism is the movement of tourists from the place they usually live in to a place of attractions. According to Medlik and Jinkins, (1991) tourism is generally seen as a growth industry because the flow of tourists to different tourist sites contributes to economic growth. A tourist is 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). Tourist patronage can therefore be described as the pattern or the frequency of visits of tourist to tourism sites. Tourism sites could be a natural or man-made feature that meet particular leisure needs of the tourist. Tourist patronage is the key factor that determines the survival of any tourism business.

The flow of Tourists is usually not uniform. There are many factors that determined the level of tourist patronage. Some of these factors include the nature of the tourism site, social amenities and infrastructures in the site, availability of transportation, security and awareness. Tourist patronage is a function of satisfaction tourist derived from services received in the tourist sites. Therefore, the amount of satisfaction derived from the available facilities and services rendered in tourism site determine the level of tourist patronage. Duyen and Thoa (2021) reported that the quantity and quality of support services (healthcare and banks), quality of human resources in the tourism sector, quantity and quality of servicing rooms, quality of telecommunications infrastructure and time factors are the major factors affecting tourism development in Southern Red River Delta in Vietnam.

Ohwo and Ndakara (2023) opined that awareness creation of prevailing tourism attractions in a destination is very significant to attracting tourist patronage. This is so because the potential tourist's decision to visit a tourist site is greatly influenced by the level of information on the tourism attractions at the destination. Meseko, et al. (2018) reported that tourism development is often based on the availability of natural settings that can be explored and developed to guarantee patronage of people for economic sustainability. These factors can lead to increase or decrease in number of tourist patronage. Therefore, it is essential to evaluate the pattern of tourist patronage in other to explore the relationship between tourism site and level of patronage.

Time series analysis is concerned with the analysis of data collected over time which could be daily, weekly, monthly or yearly. The essential feature to note in time series data is the structure and the nature of the short and long term variations of the data. Time series is used to identify consistent pattern in the values of a set of data and

prediction. It helps to detect gradual changes or shifts in the value of data. Trend analysis is essential for decision making, planning and forecasting. It is therefore, against this background that this research study is put forward to examine the time series analysis of tourist patronage in Esie Museum with the view of establishing the pattern of tourist patronage.

II. Materials and Methods

Description of Study Area
Esie Museum is located in Esie, an Igbomina town, in Irepodun Local Government Area of Kwara State. Esie museum was the first national museum in Nigeria and was established in 1945. The museum houses a collection of status known as soapstones or images representing human beings. The soapstones were discovered in 1775 by a Prince named Baragbon during a water-finding journey and there they sat in a semi-circle in the shade of a palm tree. Baragbon was baffled by the sight and quickly rushed to the palace to report it and then brought the King, the Elesie of Esie, to the site (Ezenagu, et. al. (2014; Oyefeso, 2024). The museum formerly housed over one thousand tombstone figures or images representing human beings (Romoke, 2016).

It is believed that the museum has the largest collection of soapstone images in the world (Abubakar, 2009). According to Ezenagu, et. al. (2014) the stone images are commonly called Esie soap sculptures and the establishment of the museum in the community triggered a surge of tourism as tourists frequently visit the museum to appreciate the mythistic tale of human made stones. The Esie museum presently has both old and modern galleries which houses more than 2000 objects and the gradual fading away of the belief that the museum is a shrine has also increase the rate and the number of tourists visiting the place (Romoke, 2016). Figure 1 shows the Map of Kwara State showing the position of the study area, Esie Museum.

Statistical Analysis:
The descriptive statistics, mean, standard deviation and coefficient of variation was used to summarize the data. Time series analysis was employed in the analysis of the pattern of tourists' patronage over the selected years. The main focus of the study is on the trend and seasonality of tourist patronage. The trend is the increase or decrease in values of tourist patronage while the seasonal is the movements that occur in the tourist patronage within one year. This method was used because according to Lengnen, et. al. (2020) it helps to fit an array of time bound data on a line of best fit and also display the kind of prevailing trends in the data graphically. Zaitum software was used in the analysis of the data. Zaitum Time series decomposition method was used in the analysis of seasonality while seasonal index was used in the measure of the seasonal effects and prediction of tourist patronage in the area. Semi-average method was also used to analyse the trend of the tourist patronage.
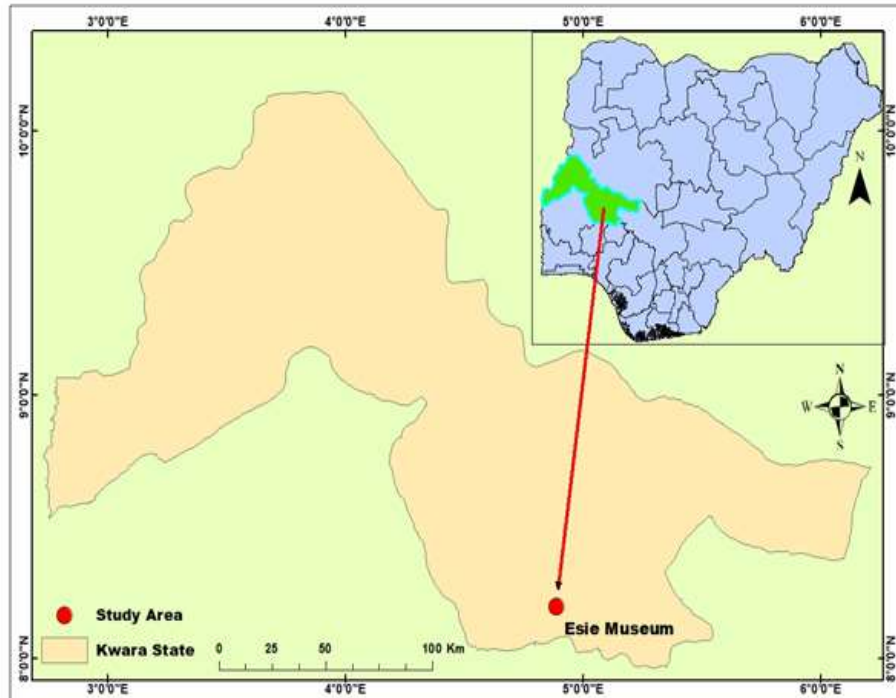
figure 1: Map of Kwara State Showing the Study Area.

III. Results and Discussion

Descriptive Analysis of Tourist Patronage in Esie Museum (2010 - 2024)
The descriptive analysis of tourist patronage in Esie museum from 2010 to 2024.was presented in table 1. The table shows the analysis of mean, standard deviation and coefficient of variation of tourist patronage. The highest mean value of tourist patronage is 1608.33 in 2019 while the lowest mean value is 136.67 in 2010. This implies that the highest value of tourist patronage was recorded in 2019. Similarly, the highest standard deviation was recorded in 2019 while the lowest deviation value was recorded in 2010. The result of the standard deviation reveals that the dispersion characteristics of tourist patronage in the study area is high.

The coefficient of variation which shows the relative deviation between values of tourist patronage showed that tourist patronage is heterogeneous with values greater than 33% from 2010 to 2016 and 2020. This implies that there is differential pattern in the values of tourist patronage in Esie museum from 2010 to 2016 and 2020. However, the number of tourist patronage in 2017, 2021, 2022, 2023 and 2024 are homogeneous because the values of coefficient of variation are less than 33%. This implies that in 2017, 2021, 2022, 2023 and 2024 there is no differential pattern in the number of tourist patronage in Esie Museum.

Table 1: Descriptive Analysis of Tourist Patronage in Esie Museum from 2010 – 2024

Month	Mean	Standard Deviation	Coefficient of Variation
2010	136.67	81.28	59.47
2011	150.00	88.63	59.08
2012	164.17	91.99	56.04
2013	183.33	106.71	58.21
2014	200.00	117.24	58.62
2015	220.00	124.54	56.61
2016	1183.33	411.94	34.81
2017	1366.67	450.42	32.96
2018	1495.83	512.77	34.28
2019	1608.33	551.79	34.31
2020	433.33	506.02	116.77
2021	750.00	241.21	32.16
2022	1145.83	296.54	25.88
2023	1262.50	331.06	26.22
2024	1381.67	354.37	25.65

Source: Authors' Computation, 2025

Trend of Tourist Patronage in Esie Museum (2010 - 2024)
Trend is one of the major components of time series. It is the increase or decrease in values of time series. Figure 2 and figure 3 show the annual and monthly trends of tourist patronage in Esie from 2010 to 2024 respectively. From the figures, the trend lines show an upward trend in the values of both annual and monthly tourist patronages. This implies that values of tourist patronage in Esie Museum from 2010 to 2024 exhibit an increasing trend.
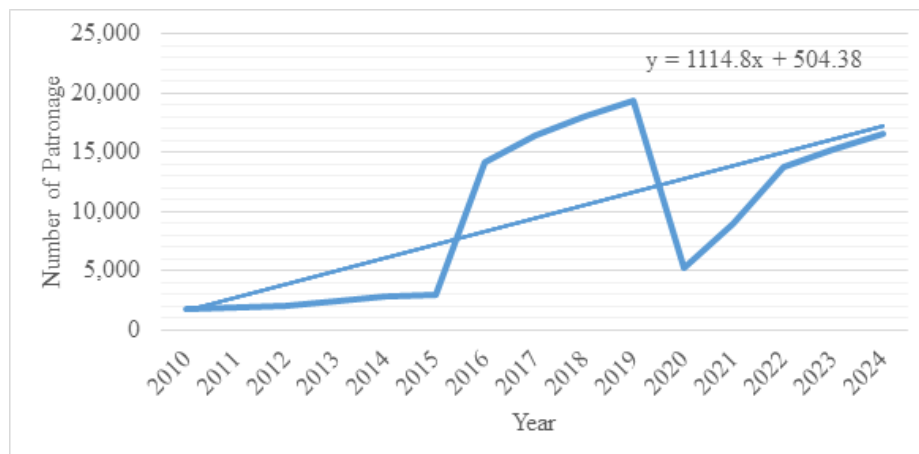

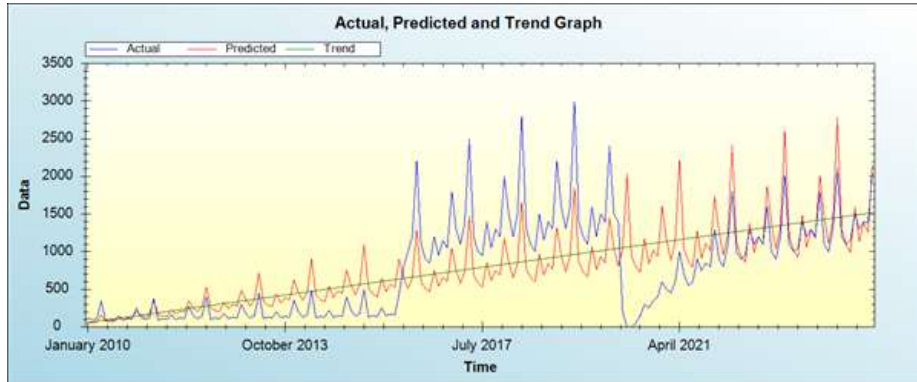Figure 2: Trend of Annual Tourist Patronage in Esie Museum

Figure 3: Trend of Monthly Tourist Patronage in Esie Museum

Trend in Tourist Patronage in Esie Using Semi-Average Method (2010 – 2024)

The monthly number of tourists' patronage in Esie from 2010 – 2024 was also analysed for trend using semi-average method. The data was divided into two equal part and the average of each part was calculated. The result of the analysis shows that the first part average of the tourist patronage was 392.78 while the second part was 1164.78. This implies that the second part average is greater than the first part average. The result therefore, indicates that the number of tourist patronage in Esie from 2010 to 2024 exhibit an upward trend from January 2010 to December 2024. The increase in number of tourist patronage could be as a result of increase in awareness and improvement in the provision of facilities and services in the museum.

Seasonal Analysis of Tourist Patronage in Esie (2014 – December, 2024)

The seasonal component of time series is the fluctuations that occurs within one- year period. Such variations are repeated every year. Seasonal indexes measure the season-to-season variation and the effects of different seasons on time series. Table 2 shows the seasonal indexes of tourist patronage in Esie Museum. From the table, the seasonal index for period 1 (January, 4 (April), 8 (August) and 12 (December) shows an above average seasonal effect on the original time series data. This implies that tourist patronage in those periods were above the average of the original values. However, the seasonal indexes in the periods 2 (February), 3 (March), 5 (May), 6 (June), 7 (July), 9 (September) 10 (October) and 11 (November) show a below average seasonal effect of tourist patronage. These imply that seasonality indexes in the months of February, March, May, June, July, September, October and November are low. In term of percentage, the seasonal index indicates that tourist patronage in period 1, 4, 8 and 12 are 2.14%, 91.64%, 7.14%, and 41.76% respectively. Nevertheless, the seasonal index indicates that tourist patronage in periods 2, 3, 5, 6, 7, 9, 10, and 11 are 22.60%, 1.66%, 11.11%, 25.59%, 33.00%, 24.00%, 8.10% and 16.45% respectively. The result shows that tourist patronage fluctuated within the months of the year.

Table 2: Seasonal Index of Tourist Patronage in Esie (2014 – 2024)

Period	Month	Seasonal Index
1	January	1.02137
2	February	0.77404
3	March	0.98345

4	April	1.91640
5	May	0.88717
6	June	0.74415
7	July	0.67002
8	August	1.07138
9	September	0.76000
10	October	0.91896
11	November	0.83548
12	December	1.41758

Source" Authors' Computation, 2025

Forecast of Tourist Patronage in Esie Museum

Time series models is one of the three main types of approaches embracing historical data to make predictions (Xing, et. al. 2022). According to He, (2023) seasonal ARIMA (SARIMA) serve as the benchmark models in most related studies. These models have been usually used when the forecast is a short-term period or when the forecast is a long term period (Xu,et. al. 2024). Therefore, seasonal index was also used to for forecasting of tourist patronage. Table 3 shows the forecast of seasonality of tourist patronage in Esie museum for the year 2030. The monthly forecast number of tourist patronage which is the product of seasonal index and the trend value were determined for each month in the year 2030. The period represents the month of the year from January to December. Therefore, from the table, the number of tourist patronage in July was predicted to be 143 while that of December was predicted to be 302.

Table 3: Forecast of Monthly Tourist Patronage in Esie (2014 – 2024)

Period	Month	Seasonal Index (SI)	Year	Trend Value	Forecast
1	January	1.02137	2030	212.71	217
2	February	0.77404	2030	212.71	165
3	March	0.98345	2030	212.71	209
4	April	1.91640	2030	212.71	408
5	May	0.88717	2030	212.71	189
6	June	0.74415	2030	212.71	158
7	July	0.67002	2030	212.71	143
8	August	1.07138	2030	212.71	228
9	September	0.76000	2030	212.71	162
10	October	0.91896	2030	212.71	195
11	November	0.83548	2030	212.71	178
12	December	1.41758	2030	212.71	302

Source: Authors' Computation, 2025

IV. Conclusion and Recommendation

Analysing tourist patronage help both the government and other stakeholders in tourism industry to formulate effective policies to serve tourists better. It also helps tourists to make better-informed decisions. The result of the trend analysis of tourist patronage in

Esie museum showed that tourist patronage exhibits upward trend from 2010 to 2024. This implies that increased trend was identified in Esie Museum from 2010 to 2024. On the seasonal index period 1, 4, 8 and 12 shows an above average seasonal effect. This implies that tourist patronage in those periods were above the average of the original values.

However, the seasonal indexes in the periods 2, 3, 5, 6, 7, 10, and 11 show a below average seasonal effect of tourist patronage. These imply that seasonality indexes in the months of February, March, May, June, July, September, October and November are low. In term of percentage, the seasonal index indicates that tourist patronage in period 1, 4, 8 and 12 are 2.14%, 91.64%, 7.14%, and 41.76% respectively. Nevertheless, the seasonal index indicates that tourist patronage in periods 2, 3, 5, 6, 7, 9, 10, and 11 are 22.60%, 1.66%, 11.11%, 25.59%, 33.00%, 24.00%, 8.10% and 16.45% respectively. Generally, the results show that tourist patronage in Esie museum will keep on increasing.

This could be as a result of increase in awareness and improved amenities and services. Therefore, based on the results of the analysis, the study recommends that both the government and other stakeholders should continue to improve the amount of satisfaction derived from Esie Museum through the provision of modern amenities and improved services to enhance tourist patronage.

References

1. Abubakar, M. (2009) Nigeria: Museum to Become Eco-Tourism Centre. Daily Trust
2. Aulia E. R., Choirul A. and Iqbal M. T. S. (2023) Analyzing Spatial Distribution Patterns of Tourism and Accessibility Level of Tourism Objects in Karanganyar Regency. H. Z. Hadibasyir and V. N. Fikriyah (Eds.): ICGDM 2022, ASSEHR 755, pp. 4–14, 2023. https://doi.org/10.2991/978-2-38476-066-4_2
3. Bassi P. and Alfred D. M. (2018) Distribution of Tourist Attraction Sites in Southern Geo-Political Zone of Adamawa State, Nigeria. International Journal for Innovation Education and Research. 6 (8)
4. Duyen, D. T. T&Thoa, L. M. (2021). Factors affecting tourism development: A case study of Southern Red River Delta, Vietnam. Journal of Business and Management Sciences, 9(1), 31-35.
5. Ezenagu, N., Olatunji, T. And Iwuagwu, C. (2014) Nigeria Sculptural Tradition as Viable Option for Tourism Promotion: An Assessment of Esie Mysterious Stone Sculptures. Global Journal of Arts Humanities and Social Sciences. 2, (5): 55-69,
6. Hassani, H., Silva, E.S., Antonakakis, N., Filis, G. and Gupta, R. (2017) Forecasting Accuracy Evaluation of Tourist Arrivals. Ann. Tour. Res. 2017, 63, 112–127.

7. He, K.; Yang, Q.; Wu, D.; Zou, Y. Tourist Arrival Forecasting Using Feed Search Information. Curr. Issues Tour. 2023, 27, 3199–3230.
8. Medik, S and Jenkins, C.L. (1991). Managing Tourism, Butterworth, Heineman London.
9. Meseko, A. A., Obeje, D., and Okansa, K. (2018). Tourism Potential of the Confluence Between River Niger and River Benue in Nigeria. Journal of Global Entrepreneurship Research, 8(6), 18-28.
10. Lengnen L. Mutgurum, A. K. Usman, and Mohammed, I. (2020) Analysis of Spatial Distribution and Patronage OF Tourism Sites in Jos, Nigeria. Jalingo Journal of Social and Management Sciences 2, (3): 54-67
11. Ohwo, O. and Ndakara, O. E. (2023) Awareness and Patronage of Tourism Attractions in Calabar, Nigeria. Journal of Studies in Social Sciences. 22, (8): 1-21
12. Okoli, C.I.C. (2014) Tourism and Travel Management in Nigeria. Enugu. Jee Communication
13. Organización Mundial del Turismo (2020) El futuro del trabajo en el turismo y el desarrollo de competencias. OMT, Madrid.
14. Oyefeso. F. (2024) Visiting the Soapstone Images: Treasures of the Esie museum, Kwara State. http://www.foluoyefeso.com
15. Romoke W. A. (2016) Esie: Nigeria's First Museum, Generates N10,000 Monthly. Daily Trust
16. United Nation World Tourism Organization. (2010). The Impact of Rising Oil Prices on the International Tourism, Special Report Number 26. Madrid: World Tourism Organization, Market Intelligence and Promotion. White, F. (1983). The Vegetation of Africa. Paris: UNESCO.
17. World Travel and Tourism Council. (2014). Travel and Tourism Economic Impact.
18. World Tourism Organisation, WTO, (1993) Report on Implementation of the Organisation's General Programme of Work for the Period 1992-1993
19. Xing, G.; Sun, S.; Bi, D.; Guo, J.; Wang, S. (2022) Seasonal and Trend Forecasting of Tourist Arrivals: An Adaptive Multiscale Ensemble Learning Approach. Int. J. Tour. Res. 24, 425–442.
20. Xu, K., Zhang, J., Huang, J., Tan, H., Jing, X., & Zheng, T. (2024). Forecasting Visitor Arrivals at Tourist Attractions: A Time Series Framework with the N-BEATS for Sustainable Tourism. Sustainability, 16 (18), 8227. https://doi.org/10.3390/su16188227