



## GEOTOURISM RESOURCES AND ECONOMIC DEVELOPMENT IN EASTERN NIGERIA

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### ABSTRACT

The study examined the relationship between geotourism resources and economic development in Eastern Nigeria. Two research questions and hypotheses were formulated to guide the study. The primary source of data was deployed to gather data from the study area and sample. Descriptive and inferential statistics were adopted for the analysis of response rate and testing of hypotheses respectively. The findings showed that geotourism resources have a positive and significant relationship with employment opportunities in Eastern, Nigeria. It also revealed that geotourism resources have a positive and significant relationship with the community development of the study area. The study, therefore, concluded that the development of the geotourism resources into sustainable tourism products becomes imperative to enhance the economic development of Eastern Nigeria. It is recommended that government at all levels should provide adequate funding for the development of geotourism in Eastern Nigeria; that government should provide infrastructural facilities in the geotourist centers; that government should consider developing more geotourism centers because of its educational benefit and that the communities where this geotourism is domiciled should help the government with internal security.

### KEYWORDS

Geotourism, resources, employment, community development, cave, rock, waterfall.

## Introduction

The eastern Nigeria geomorphology is characterized with diagonal landscape which constitute a form of natural resources for tourism. This geology and landscape that forms tourism is called geotourism. The features of this tourism are mountain, hills, cave, rock, waterfall, valley, etc. Geotourism attractions are visited because of their scenic geological formation, unmodified vegetation, water resources, among others have contributed to community development, income generation and employment opportunities. It should be emphasised that all this natural endowment deposited in this region have not been tapped significantly from independence till date. Then, all these natural archaeological sites from nature have turned to be a blessing to the place of the communities where these are found.

The caves, the waterfall, the valley, the mountain, and the rock are the focus of this project which abounds in some parts of the Igbo land and are rich natural attractions that bring growth and source of income to the people, the community and the state in general (Oguamanam & Okonkwo, 2018). Enugu has some geotourism resources such as Mmaku and Achi in central Nsukka-Okigwek, the Ogbunike Cave in Anambra, the Ozuitem spring in Abia and the Okpu Chukwu in Isikwuato. This means that there is a significant range in the relative abundance of archeological sites in this part of the states compared to other places, which suggests that there is a high degree of grouping of archaeological sites that can be developed to promote tourism in these areas through careful design, as has been done in various parts of the country.

The potential of geotourism in the study area lies in the presence of geological and environmental phenomena that adequately cover information on the assessment of landscape and geographical heritage in relation to the management, interpretation, education, and future of Geotourism, as it sets the scene and provides a clear definition of Geotourism as well as information on its characteristics. Geotourism is a recreational activity that involves moving people to destinations far from their usual place of residence. It was promoted by introducing regular and paid vacations, increasing incomes, seasonal differences and removing distance barriers with improved transportation and communication systems (World Tourism Organization Journal, 1995).

Geotourism creates jobs directly through hotels, restaurants, nightclubs, taxes and sales of souvenirs and other related items. Also, the provision of goods and services needed by tourism-related businesses were other sources of employment and income generation. According to the World Tourism and Travel Commission (1992), tourism supports 7% of the world's workers. Adejuwon, (1993) discussed tourism as the movement of an individual or a group of individuals from his / her home to a place far or near, for the purpose of leisure. Emmanuel (2005) observed that tourism helps people escape the boredom of their location and work, provides fun and relaxation and also enhances people's physical health.

The huge geotourism opportunities that abound in Eastern Nigeria makes it an asset to the host communities, the government and even tourism stakeholders. The main objective of was to determine the relationship between geotourism resources and economic development in Eastern Nigeria. The specific objectives set were as follows.

- (i) Identify the impact of geo-tourism resources on employment opportunities in Eastern Nigeria.
- (ii) To assess the influence of the of Geotourism resources on the community development of the Eastern Nigeria.

## Research Hypotheses

- (i) There is no significant relationship between geo-tourism resources and employment opportunities in Eastern Nigeria.
- (ii) There is no significant relationship between geo-tourism resources and community development of the Eastern Nigeria.

## Literature Review

### Conceptual Review

#### The Concept of Geotourism

The geotourism potential of the study area lies in the presence of geological and environmental phenomena that adequately cover information on landscape assessment and geographical heritage in relation to the management, interpretation, education and future of geotourism, as it sets the scene and provides a clear definition of geotourism as well as information on its characteristics.

The word "tourism potential" is often used in the context of measuring its quality. However, it is worth clarifying what the concept of dynamic geotourism means, what types of elements, characteristics and values of a geotourist object include this potential; for what purposes and by whom this potential can be used. This will help standardize terminology and better apply the values of geodiversity in geoeducation. The definitions of the term geotourism proposed by various authors indicate the reason for geotourism (geological method of geotourism), the form of tourist activity, the object of interest and the method of disposal of an object of geotourism (Dowling, & Newsome, 2018).

1. The form of tourism is classified as cognitive and focuses on the acquisition of knowledge (knowledge and understanding) about the objects visited, their observed characteristics and their ongoing geological processes (Newsome, & Dowling, 2010; Martini, Alcalá, Brilha, Iantiria, Sá, & Tourtellot, 2012). It is stimulated by the desire for aesthetic experiences while in contact with the beauty of nature (Słomka, & Mayer, 2010). The concept of geotourism as a form of tourism activity is addressed to a wide audience (Hose, & Vasiljević, 2012). However, this idea uses the targeted interests of the tourist, which motivates people to practice sightseeing, as well as cognitive, active and adventurous tourism. The recipient of a geotourism offer is a person who is interested in the surrounding world and focuses on learning and understanding the processes that take place in it. The creation of geotourist attractions that will interest tourists requires, first of all, an analysis of the geotouristic potential of a given object or area (Pralong, 2006).

2. The object of interest for geotourism is the landscape together with its structure and geological history, as well as individual objects of geotourism (Doktor, Miśkiewicz, Welc, & Mayer, 2015), geological processes that can be observed and material manifestations of human activity using the Earth's resources. However, the elements of geodiversity (Gray, 2004) and geo-heritage are not equally attractive and worth exploring for a geotourist, whose attention will first be drawn to high visual objects with interesting shapes, colors, sizes or process intensity levels taking place (Strba, 2018). Items with promoted attractive and innovative geo-interpretation offer can also arouse his interest. As a form of tourism, geotourism - especially at regional or national level - should be based on such facilities. On the other hand, geotourism can be a tool of sustainable development facilitating the high-quality development of geotourist objects of local importance, usually those that are less spectacular. Such objects "in the neighborhood" with appropriate information facilities will be a valuable geoeducational tool, which will allow one to understand the relationship between natural processes and human activities (Martini, Alcalá, Brilha, Iantiria, Sá, & Tourtellot, 2012). Regardless of the classification of an installation, it is necessary to develop its geotourism potential, the full or selected range of which will be used in geoeducation.

3. The method of disposing of the object for geotourism should consider the activation of the tourist traffic (Słomka, & Mayer, 2010), the preservation of the presented geographical heritage and the provision of geointerpretation facilities and appropriate infrastructure that allows the acquisition of knowledge (Hose, 2012 ; Hose & Vasiljević, 2012). The willingness to learn, which motivates geotourists to be active, requires a way to make geotourist objects more accessible, so that, by exploring and using the values of the object, knowledge is transmitted in an innovative way and the geographical heritage is kept unchanged. Geotourism, understood as area management, is implemented in this way. The need to equip a geotourism object with facilities for interpretation and service for tourists is indicated by the various definitions of geotourism. This equipment includes a variety of geotourism products (Dryglas, & Miśkiewicz, 2014; Farsani, Mortazavi, Bahrami, Kalantary, & Bizhaem, 2017), such as geotourism trails and paths, geointerpretation panels, geoeducational

centers, specialized services, geodetic events and use modern multimedia solutions. The creation of such products requires an analysis of the geotouristic potential of a site (or region) and the availability of these products to the public helps to learn and understand the many inextricable relationships between the geological structure of the region, its shape, biodiversity characteristics and of current cultural values reduced groundwater levels, etc. As a result, the awareness of local communities in the field of sustainable development policy is increasing, with care focused equally on the environment and people (Martini, Alcalá, Brilha, Iantiria, Sá, & Tourtellot, 2012).

The correct implementation of the activities in each of the above issues is possible only after a thorough analysis of the geodiversity represented by a given geotourist object. The evaluation of the values of geotourism, the geointerpretation of the Earth's heritage and the creation of appropriate geoeducational tools are of interest in geotourism developed as a scientific research in geology (Hose, 2012; Hose & Vasiljević, 2012). Geography as an academic science also identifies and explains landscapes on the Earth's surface (Beltrán-Yanes, Dóniz-Páez, & Esquivel-Sigut, 2020). Scientists analyse and evaluate objects and areas in terms of their suitability for geotourism and geoeducation. The object of their research is the total geodiversity of the geotourism object on which the designed research methods and tools are tested and from which elements useful for geoeducation are selected.

Geotourism activity, complete and based on the above data, can be carried out by visiting a geotourism attraction. Similarly, for tourists, a geotourist attraction is a material object that can be seen and / or an activity that can be carried out independently thanks to a specially prepared tourist infrastructure. The only difference is the issue of attraction, which, in the case of geotourism, is geology and the landscape (Witt, & Moutinho, 1994; MacCannell, 1999).

A geotourist attraction is created based on an object of geotourism that represents the earth sciences, which may include, for example, a geological eruption, a river gorge, a waterfall, a cave, a quarry or aspects of cultural geographical heritage intended for example, stone in architecture, mining heritage sites, cultivation area based on geomorphology (Doktor, Miśkiewicz, Welc, & Mayer, 2015). Every object of geotourism has a specific resource of characteristics - a "potential" - that allows one to learn and understand its structure, genesis and properties, which can be properly used in geoeducation. The characteristics that include the potential of geotourism should be well developed and understood. Their interpretation should not raise objections and the tourist should be able to observe them alone or with a little help. The tourist should be informed about what a given feature is and why it was developed in this way through geo-educational material available in the immediate vicinity of the facility (Wehmeier, 2000).

The set of characteristics that allows the full characterization of the object, together with the indicated topics of geoeducation, represents the potential of geotourism, which is defined in this article as the abiotic characteristics of a geotourism object and the relevant biotic and cultural elements, whose good visibility attracts the attention of tourists and whose appropriate geo-interpretation allows geo-education and causes an increase in tourist traffic. The sense of geotourism as a form of cognitive tourism lies in the process of observing and understanding the diversity of the geological structure, its genesis and its effects on the surrounding biological and cultural values. Properly integrated geotourism potential for a given geotourism object allows one to:

- Select the features / elements of the object that attract the tourist's attention.
- Record the benefits of the item that may be of interest to a tourist.
- Gather the full range of educational topics that form the basis of geoeducation.
- Choose the range of geoeducation that is suitable for different groups of recipients.
- Choose geoeducation tools suitable for the range of knowledge presented (eg blackboard, multimedia board, smartphone application, field game, search, etc.).

### **Geotourism Properties in the Eastern Nigeria**

The eastern Nigeria is fronted with a lot of mineral resources from the angle of geological depositions of structure such as caves, waterfall, spring water, hills, rock and lakes expanding from the five states of the region.

### The caves

The cave is an underground cavity or a deep hollow part significantly larger than the ground surface. Large caves are called caves. Caves are fragile natural resources that may contain records of archaeological, palaeontological and palaeo environmental changes. Caves are produced by erosion work (mainly erosion and abrasion) (Fig. 1) Erosion means erosion by the abrasive action of running water containing sand, pebbles and other debris. This contrasts with "corrosion" which means a chemical action such as the formation of rust or the "consumption" of a substance as nitric acid corrodes copper. Corrosion or dissolution involves the dissolution of soluble materials through the process of decomposition and decomposition of carbonate rocks. Ancient speleologists attributed the main role in the formation of caves in the erosive activity. Cave currents can often be found to widen their channels, and cave systems are thought to have been created by this process (Madhumita, Shreerup, & Guru, 2007).



Figure 1 : Some selected caves in the Eastern of Nigeria.

### The waterfall

The waterfall is a vertical or near-vertical fall on a rock surface in a stream of water, marked at the top by a clear rim or a steep slope in the canal slope (Mabin (2000: 86) Sometimes there may be a submerged pool. horizontal distance between the positions of the rim and the pool should be no more than 25% of the height of the waterfall. This work concerns only the waterfalls sensu stricto. The waterfalls have a number of shapes: they can have protrusions, they appear as a series of steps, may have pools, may have broad arcuate shapes (Horseshoe Falls) or may be elongated. A classification used by National Geographic (2018) divides waterfalls into the following types:

- A block waterfall descends from a wide stream
- A waterfall is a waterfall that descends over a series of rock steps
- A cataract is a powerful, even dangerous, cataract
- The pipeline is a waterfall in which the passage of the stream is very narrow, pushing the water to pass with unusually high pressure
- Fan waterfalls are named for their shape. The water spreads horizontally as it descends
- The ponytail cascades maintain contact with the hard rock beneath them
- Multi-step waterfalls are a series of connected waterfalls, each with its own pool
- Diving waterfalls, unlike ponytail waterfalls, lose contact with the hard rock
- Punchbowl waterfalls are characterized by wide pools at their base
- Fragmented waterfalls are where the flow is separated as distinct streams



Figure 2 Some selected waterfall in the eastern Nigeria.



## Rocks

There are a lot of definitions of what rocks is about, from Ehlers and Blatt, (1997), they defines rocks as the materials from which the earth is made. A more accepted scientific definition of rocks is that; A rock is a natural solid cohesive inert from one or more mineral or mineral materials. Rocks are broadly classified into three groups based on their formation process. The three main types of rock are: igneous rocks; sedimentary rocks and metamorphic rocks. Sedimentary rocks make up 66% of the earth's crust, with 34% being igneous and metamorphic. However, igneous rocks make up the majority of 34% (Ehlers and Blatt, 1997). The reason that sedimentary rocks are responsible for most of the rocks on the earth's surface is because they are mainly found in ocean floor basins that represent 70% of the total land area. The three types of rocks are further classified based on their chemistry, formation environment and mode of formation.



Figure 3 Some selected waterfall in the eastern Nigeria.

## Economic development

Economic development describes the process of raising the level of prosperity in a particular place (such as a country) through increased production, distribution and consumption of goods and services. Tourism through its activities engenders economic development in several tourism destinations all over the world. It is argued by Mihalic (2014) that the demand for tourism at tourist destinations contributes to economic growth and acts a catalyst of positive structural transformation of the local economy. Tourism has multiplier economic effects in the economy which is described in three ways: direct, indirect and induced effects. For this current study, the measures of economic development used are employment opportunities and community development.

**Employment Opportunities:** The components of tourism such as hospitality, visitor attractions, transportation, travel trade, etc are all labour intensive. They generate a lot of employment opportunities for various categories of people including the local people at tourism destinations. It is argued that, travel and tourism is a dynamic engine of employment opportunity as it employs one in every ten jobs on planet earth(WTTC, 2018).

**Community Development:** There are various ways by which tourism contributes to the community in a tourism destination region. For example, in the context of ecotourism, the local people are involved in the provision of tourism goods and services from where they generate revenues. Cultural tourism commoditisation is guaranteed by the local people also. The quest by the national government to provide appropriate infrastructural facilities for use by the visiting tourists and the inhabitants of the communities engenders community development. As noted by Lane (as cited in Jamal & Drodge, 2014), rural tourism consist of series of activities such as food and wine tourism, farm/agritourism, cultural and heritage tourism, adventure tourism, nature tourism and ecotourism which are all channels of community development.

## Empirical review

Many archaeological sites have been located in parts of Igbo land, the distribution, however, shows that a greater concentration of these sites is in Nsukka-Okigwe cuesta. This includes the cave and rock shelter sites in the Udi/Awgu highlands (Ezeadichie 2002). Ekechukwu identified 15 caves in Obeagu, a community located on the eastern side of Mmaku in Awgu highlands which goes to confirm that the area has one of the highest densities of caves on the cuesta (Ekechukwu 2002). Umeji (1995) studied many caves, which include Uhu Chukwu cave Isikwuato with six chambers, Okpu Chukwu cave still in Isikwuato all in Abia State Nigeria. She identified six caves within a distance of 15m occurring on the northern face of an E-W trending cliff in Mamu

formation: Isi-Ugwu Obukpa, Nsukka, Ogba Agu, Ngwu Nruru, Nsukka in Enugu State Nigeria. One similar feature of these caves is that they are all of sandstone formation.

Ibeanu (2000), writing on Okigwe caves and the need to develop the caves into tourist resort noted that caves and rock shelters have a very challenging and exciting landscape and this landscape on its own is a tourist attraction. He went further to say that “the heritage of any given society includes the following: historical sites and building such as locations, sacred grooves, caves, which have played roles in the origin and migration of people as contained in their traditions of origin. When these heritage resources are properly interpreted and presented, they will serve as tourist attractions.” He went further to say that Okigwe caves and landscape can be harnessed by creating awareness of these tourism products which will be possible through sustainable documentations, interpretations and education of the people who had and still have direct relationship with caves and their immediate environment.

Welc and Mi'skiewicz, (2020) carried out a study on “The Concept of the Geotourism Potential and Its Practical Application: A Case Study of the Przadki (the Spinners) Nature Reserve in the Carpathians”. Based on their field research, their main results clearly emphasized the features within the geotourism object relate to geotourism potential, while educational potential and tourist infrastructure are not to be identified with this potential. The inclusion of a new procedure for use in geotourism research provides a comprehensive approach to the inventory of geotourism objects and the educational use of a biotic element of nature, as well as biotic and cultural aspects related to geoheritage. They presented model has practical application in the design of geoeeducational materials.

Sanusi, Idris, Mahmud, and Zoaka (2020) under study the “A Review of Bauchi State Geo-Tourism Resource Attractions, with Potentials for Hospitality, Recreation and Tourism Development”. Their study investigated issues of immense contribution to Geo-Tourism resource attractions by special attention to preserve, protect and promote our culture and tradition at the identified tourist sites of Land, Water, Climatic, Vegetation and Historical based. They recommended that government and stakeholders should strictly enforce the law that provides enabling environment and logistics for developing geo-tourism resource attractions, with potentials for hospitality, recreation, and tourism in Bauchi State, Nigeria.

### Methodology

This study adopted correlational research design. The population of this study contains some geotourist communities in the eastern part of Nigeria with population figure of 2300. The sample size was determined using Taro Yamane formula

$$n = \frac{N}{(1 + N)(e)^2}$$

Where n= sample size required; N = number of people in the population e = allowable error (%)

Substituting the value of 2300 into the equation

$$\begin{aligned} &= \frac{2300}{(1 + 2300)(0.05)^2} \\ &= 340.74 \\ &\approx 341 \text{ sample size} \end{aligned}$$

Primary method of data collection (questionnaires) was used as instrument for data collection. Descriptive and inferential statistics was adopted to analyse the research questions and test the hypotheses.

### Results and Discussion

**Table 1: Data presentation , N= 341**

S/No	Geotourism Attractions	Total questionnaire	Returned questionnaire	Unreturned questionnaire
1	Mmaku and Achi located in Enugu State.	114 (33.43%)	98 (34.75%)	16 (27.12%)
2	Ogbunike cave located in Anambra State	114 (33.43%)	96 (34.04%)	18 (30.51%)
3	The spring water of Ozuitem located in Abia State	113 (33.12%)	88 (31.21%)	25 (42.37%)
	Total	341(100%)	282 (100%)	59 (100%)

The questionnaire of 341 were administered to the communities where these caves and spring water were located. Mmaku and Achi had 114(33.43%) administered to them and 98(34.75%) were retrieved and was subjected to data analysis while 16(27.12%) was not retrieved and therefore unusable. Ogbunike community had 114(33.43%) administered to them and 96(34.04%) were retrieved and was subjected to data analysis while 18(30.51%) was not retrieved and therefore unusable. Ozuitem community had 113 (33.12%) administered to them and 88(31.21%) were retrieved and was subjected to data analysis while 25 (42.37%) was not retrieved and therefore unusable.

### Testing of Hypotheses

**Hypothesis 1:** There is no significant relationship between geo-tourism resources and employment opportunities in Eastern Nigeria.

**Table 2:** Model output of geo-tourism resources and employment opportunities in Eastern Nigeria.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.998 <sup>a</sup>	.977	.968	3.74310	.977	302.502	1	6	.000	2.512

a. Predictors: (Constant), Geo-tourism\_resources

b. Dependent Variable: employment\_opportunities

Table 2 showed the model output of hypothesis one revealing that there is significant relationship between geo-tourism resources and employment opportunities in Eastern Nigeria at correlation coefficient  $r = .998$ . This result is positive and significant. The decision rule states that we accept the null hypothesis at 0.05% significance while greater than the 0.05% we uphold the alternate hypothesis. In other words, geo-tourism has positive and significant relationship with employment opportunities in Eastern Nigeria.

**Hypothesis 2:** There is no significant relationship between geo-tourism resources and community development in Eastern Nigeria.

**Table 3:** Model output of geo-tourism resources and community development in Eastern Nigeria.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.924 <sup>a</sup>	.901	.907	3.64312	.901	303.411	1	6	.000	2.533

a. Predictors: (Constant), Geo-tourism\_resources

b. Dependent Variable: Community\_development

Table 3 indicated the model output of hypothesis two showing that there is significant relationship between geo-tourism resources and community development in Eastern Nigeria at correlation coefficient  $r = .924$ . This result



is positive and significant. The decision rule states that we accept the null hypothesis at 0.05% significant while greater than the 0.05% we uphold the alternate hypothesis. In other words, geo-tourism has positive and significant impact on community development in Eastern Nigeria.

### Discussion of findings

The study on geotourism resources and employment opportunities in Eastern Nigeria. This study revealed that geotourism resources have positive and significant relationship with employment opportunity and community development in the study area. This result is in agreement with the works of Ekechukwu (2002); Umeji (1995); Ibeanu (2000); Welc, and Mi'skiewicz, (2020) and Sanusi, et al (2020).

### Conclusion

The Eastern Nigeria are blessed with geotourism resources. The characterization of geological landscape includes hills, cave, rock, waterfall, valley, etc. Tourism is the movement of people from destination to another for the purpose of holiday (short rest or long rest), student excursion, family tourism, religion, and cultural events. The geotourism visitor attractions have brought about unprecedented employment and community development in Eastern states of Nigeria. This geological formation has been used for the purpose of academic work by geologists, geographers, and tourism students. The study therefore concludes that the development of the geotourism resources into sustainable tourism products becomes imperative to enhance the economic development of Eastern Nigeria.

### Recommendations

From the findings, the following recommendations were provided:

- (i) that government at all levels should provide adequate funding for the development of geotourism visitor attraction market in Eastern Nigeria.
- (ii) that government should provide infrastructural facilities in the geotourist centre.
- (iii) that government should consider developing more geotourism centres because of its educational benefit.
- (iii) that the communities where this geotourism visitor attractions are domiciled should help the government with internal security.

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