

Geo-Tourism for Wealth Creation: Unveiling the Geoscience Potential of Southeast Nigeria

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Abstract - This study highlights the emergence of geo-tourism as a cutting-edge field within geoscience, focusing specifically on Southeast Nigeria. Geo-tourism refers to a specialized form of sustainable tourism that showcases geology, landscape, and natural features as the main attractions for tourists. This study explores the potential of geo-tourism in Southeast Nigeria as a catalyst for wealth creation, socio-economic development, and environmental conservation. The case study provides a comprehensive analysis of the region's unique geological attractions, cultural heritage sites, and environmental resources. Southeast Nigeria is rich in diverse and distinctive geosites, including volcanic landscapes, cave systems, waterfalls, and heritage sites. These geological features, together with the region's vibrant cultural traditions, offer significant opportunities for the development of geo-tourism. The study examines the economic benefits that can be derived from geo-tourism, such as job creation, local business growth, revenue generation, and community empowerment. Moreover, the positive socio-cultural impacts of geo-tourism on local communities, including the preservation of indigenous knowledge and cultural practices, are discussed. The research also emphasizes the importance of sustainable practices in promoting geo-tourism. It highlights the need for stakeholder collaboration, responsible tourism practices, adequate infrastructure development, and environmental management to ensure the long-term viability and conservation of the natural and cultural heritage sites. Furthermore, the study explores potential challenges and constraints associated with developing geo-tourism in Southeast Nigeria. These include inadequate infrastructure, limited marketing efforts, lack of awareness, and potential environmental impacts. Strategies to overcome these challenges, such as capacity building, public-private partnerships, and community engagement, are considered. The findings of this study contribute to the growing body of knowledge on geo-tourism as a viable pathway for wealth creation through geoscience. The case study of Southeast Nigeria sheds light on the untapped potential of the region's unique geological and cultural heritage, offering valuable insights for policymakers, researchers, and stakeholders interested in developing and promoting sustainable tourism practices in similarly geographically diverse regions.

Keywords: Geo-Tourism, Geo-Science, Cultural Heritage Sites, Capacity Building

I. INTRODUCTION

Natural geo-tourism centers in Southeast Nigeria have had a significant impact on the region's economy, environment,

and cultural preservation. These centers, which include natural landscapes, geologic formations, and historical sites, have attracted tourists from all over the world and contributed to the growth of the tourism industry in the region.

A. Economic Impact

One of the major impacts of natural geo-tourism centers in Southeast Nigeria is the boost to the regional economy. These centers have generated significant revenue through tourism activities such as entrance fees, accommodation, transportation, and souvenirs. The influx of tourists has also created job opportunities for locals, especially in the hospitality and transportation sectors.

Furthermore, the development of tourist facilities like hotels, restaurants, and souvenir shops in these areas has led to the growth of small and medium enterprises, providing employment and income for the local community. This has helped to alleviate poverty and improve the standard of living in the region.

B. Environmental Impact

Natural geo-tourism centers in Southeast Nigeria have also played a crucial role in promoting environmental conservation and sustainable development. The preservation of these sites has helped protect the biodiversity and natural habitats of the region, leading to the sustainable use of natural resources and reducing human impact on the environment.

Moreover, the development of these centers has encouraged the adoption of eco-friendly practices, such as waste management and energy conservation, by both tourists and local communities. This has contributed to the overall protection and preservation of the environment in the region.

C. Cultural Impact

Many natural geo-tourism centers in Southeast Nigeria are also important cultural sites, rich in history and cultural

heritage. Tourism activities in these areas have helped promote the preservation and celebration of the diverse cultures and traditions of the region.

Through guided tours and cultural presentations, tourists learn about the history, customs, and traditions of the local communities, creating awareness and appreciation of the region's cultural diversity. This has also helped promote intercultural understanding and tolerance among visitors.

II. STATEMENT OF PROBLEM

The potential benefits of natural geo tourism centres in south east Nigeria are not fully realized due to lack of infrastructure, inadequate promotion and marketing, and environmental degradation

II. AIMS AND OBJECTIVES

1. To assess the current status of natural geo tourism centres in south east Nigeria.
2. To identify the factors hindering the development and promotion of these tourism centres.
3. To evaluate the economic, social, and environmental impacts of natural geo tourism centres on local communities.
4. To propose strategies for sustainable development and promotion of natural geo tourism centres in south east Nigeria.
5. To raise awareness and promote the potential of these tourism centres to attract both domestic and international tourists.

A. Significance and Scope of the Study on the Impact of Natural Geo-Tourism Centers in Southeast Nigeria

The significance of studying the impact of natural geo-tourism centers in South East Nigeria lies in understanding the environmental, social, and economic implications of these attractions. Some key points of significance include:

1. *Environmental Impact:* Studying these centers can help assess the effects of tourism activities on the local ecosystem, wildlife, and natural resources. This information is crucial for sustainable management and conservation efforts.
2. *Social Impact:* Understanding how geo-tourism centers affect local communities, their livelihoods, and cultural heritage is essential for promoting responsible and inclusive tourism practices.
3. *Economic Impact:* Analyzing the economic benefits and opportunities generated by these tourism sites can provide insights into the potential for job creation, revenue generation, and overall economic development in the region.

III. RESEARCH QUESTIONS

1. What are the geological features and landscapes in Southeast that have the potential geotourism development?
2. How has natural geotourism impacted the economy of Southeast Nigeria in terms of revenue generation and employment opportunities?
3. What are environmental impacts of increased geotourism activities on the natural geological sites in Southeast Nigeria, and how can they be mitigated?
4. How does geotourism contribute to the preservation and conservation of the geological heritage in Southeast Nigeria?
5. What are the social and cultural impacts of geotourism in Southeast Nigeria, and how are local communities engaged and involved in geotourism activities?
6. What are the existing policies and practices related to geotourism development, management, and marketing in Southeast Nigeria?
7. How aware and informed are tourists and locals in Southeast Nigeria about the concept and benefits of natural geotourism?
8. What challenges and barriers exist for geotourism development in Southeast Nigeria?

IV. METHODOLOGY

We developed a questionnaire or survey instrument to collect data from selected respondents on Geo-tourism: A New Geosciences Frontier of Wealth Creation - A Case Study of South East Nigeria [3]. It Include questions to assess the current level of knowledge of geo-tourism concepts, the perception of the impact of geo-tourism, the need for geo-tourism development, and the potential benefits of improved geo-tourism in the region.

The Administration of the survey to the selected participants is through face-to-face interviews or online surveys, depending on the accessibility and preferences of the participants. 100 respondents were randomly selected from five Southeast (Anambra, Enugu, Ebonyi, Imo and Abia states).

We collected additional qualitative data through focus group discussions or individual interviews to gain more in-depth insights into specific issues or challenges related to Geo-tourism: A New Geosciences Frontier of Wealth Creation - A Case Study of South East Nigeria. Finally, online secondary materials such as past journals and related textbooks were not left out [2].

V. RESULTS OF THE STUDY

TABLE I RESULT OF THE QUESTIONS

Sl. No.	Items	Yes(%)	No(%)	No Reply
1	Are the geological features and landscapes in Southeast that have the potential geotourism development?	78	20	2
2	Has natural geotourism impacted the economy of Southeast Nigeria in terms of revenue generation and employment opportunities?	34	62	4
3	Are there environmental impacts of increased geotourism activities on the natural geological sites in Southeast Nigeria?	72	18	10
4	Does geotourism contribute to the preservation and conservation of the geological heritage in Southeast Nigeria?	61	32	7
5	Are there social and cultural impacts of geotourism in Southeast Nigeria?	87	9	4
6	Are the existing policies and practices related to geotourism development, management, and marketing in Southeast Nigeria?	51	40	9
7	How aware and informed are tourists and locals in Southeast Nigeria about the concept and benefits of natural geotourism?	67	25	8
8	Are there challenges and barriers exist for geotourism development in Southeast Nigeria?	92	7	1

Source: Field report 2023

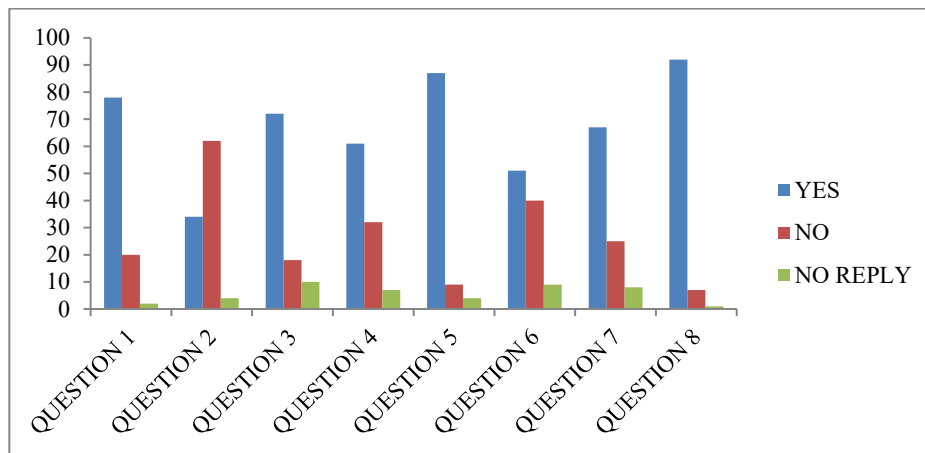


Fig. 1 Graphic representation of the result

VI. NATURAL GEO- TOURISM CENTRES

1. Awhum Waterfall: Situated in the Nigerian state of Enugu, the waterfall is situated in the hamlet of Amugwu inside the Udi Local Government Area. The Awhum Waterfall is a large granite rock outcrop that has a trickle of water flowing through it near the top. During the season, certain areas of the waterfall are typically warm. The Awhum waterfall is located next to a monastery and is around thirty meters high.

It is stated that the water has the power to heal all harmful powers, depending on where and how it is poured.

The Awhum waterfall in Nigeria is a popular tourist attraction for those who enjoy the outdoors and outdoor activities [2]. It is open to visitors to explore, stroll among the tumbling waterfalls, and take a dip in the glistening waters.



Fig. 2 Pictures of Awhum Waterfall

2. *Ngwo Pine Forest*: The unique geological formation of tall, pine trees and a wide variety of vegetation is the distinctive feature of this natural tourism center in Enugu State. In this peaceful environment, visitors can participate in activities like hiking, bird watching and camping [1]. In the center of Enugu, Ngwo Pine Forest is a wooded area. It hosts a limestone cave sculpted by a small waterfall that forms a shallow pool at the bed of the cave. The Ngwo Pine

Forest is used as a play field, most frequently as a picnic area. For Enugu State, Nigeria, this is a means of developing the economy [7]. The Ngwo Pine Forest Formation [NPF] is a patch of montane rainforest and cloud forest on the Ngwo Hills in southeast Nigeria. It is the southernmost part of the Afromontane forest ecoregion, which makes it one of Africa's more diverse forests.



Fig. 3 Picture of Ngwo Pine Forest

3. *Ngwo Cave and Waterfall*: It is a natural attraction located in the Ngwo Pine Forest in Enugu State, Nigeria. The cave is formed from limestone and has a waterfall flowing from an opening in its roof. On the floor of the cave, the waterfall forms a shallow pool and flows as a small stream. For Nigerians as well as international visitors, it's a great tourist

destination [4]. For the Igbo people in Nigeria, it's also important to them. A number of important cultural sites, including shrines and burial grounds, are located in the cave. Ngwo Cave and Waterfalls are threatened by a number of threats, ranging from deforestation to pollution or tourism.



Fig. 4 Ngwo Pine Forest Pictures

4. *Oguta Lake*: formed by the damming of the lower Njaba River with alluvium, Oguta Lake is a narrow finger lake. It is the largest natural lake in Imo State, Southeastern Nigeria; [3] within the equatorial rainforest region of Niger Delta. Oguta Lake's catchment area comprises the drainage area of the Njaba River and a part of the River Niger floodplain in the region south of Onitsha. Located in Imo State, Oguta Lake is the largest natural lake in South East Nigeria. A wonderful view of the lake and its surrounding landscape is offered at this natural tourist center. Fishing, boat rides and birdwatching are activities that visitors can participate in. A wonderful view of the lake and its surrounding landscape is offered at this natural tourist center. Fishing, boat rides and birdwatching are activities

that visitors can participate in. The main outflow to Oguta Lake is the stream from the Njaba River [9].

Awbana, Utu and Orashi are the other three streams [10]. In its western part, the Orashi River runs through Oguta Lake. In Oguta Lake, the rainy season is mild in comparison with the humid and slightly cloudy summer. The temperature is usually between 68F and 88F in the year, rarely below 60F or over 91F. Based on beach/pool score, the best time of year to visit Oguta for hot-weather activities is from late November to late January. The lake, as a source of water, fish, tourism and an outlet for the sewerage system, is significant to oil-rich Njaba river basin people including Oguta, Orsu, Mgbidi, Nsi, Osemotor, Nnebukwu, MgOmebel Awa, Awokwe AkAB.



Fig. 5 Pictures of Oguta Lake

5. *Azumini Blue River*: Azumini Blue River in Aba, Abia state, Nigeria ...this is a river that joins with IMO river and heads to Atlantic Ocean through Akwa-Ibom. It is one of the major blue rivers in Nigeria as one can see clearly stones on the water bed. This natural tourism centre is known for

its crystal-clear blue water that flows through a series of underground caves. Visitors can swim in the river, relax in the nearby resorts, and explore the surrounding caves and waterfalls [5].



Fig. 6 Picture of Azumini blue river

6. *Ogbunike Caves*: Ogbunike's Cave is situated in Anambra State, southeast Nigeria. In the valley which has been surrounded by Tropical Rain Forest for more than a hundred years, local people have used this collection of caves with great religious meaning to them [3]. As the "Ime Ogba" Festival is celebrated every year to mark the discovery of caves, this spiritual significance remains very evident. There's a long path made up of about 317 steps descending into the valley where the caves are located by the Anambra State Government in the mid-90s. Visitors must remove their shoes before entering the caves, as per tradition.

The main cave is a massive structure with an open chamber at its entrance that is roughly five meters high, ten meters wide, and thirty meters long. Ten tunnels, each pointing in a different direction, are located in the chamber's center.

Within the tunnel are large rooms and variously sized tunnels, some of which are connected. The caverns are home to a sizable colony of bats of all sizes. Everywhere you look are bodies of water and streams. A swift-moving stream known as the River Nkissa emerges from one of the tunnels. The warm water from the caverns and the cold river water can be felt where the river and stream converge. A thick tropical rainforest type of vegetation is present in the immediate environment of the caves up to a distance of approximately 200 meters. In order to protect its values from the direct effects of human disturbance, the area has sufficient boundaries of 20 hectares. These ancient caves offer a unique geological experience with its numerous chambers and waterfalls. Guests can walk around the caves and also engage in activities like swimming, rock climbing, and sleep outdoors.



Fig. 7 Pictures of Ogbunike Cave

7. *Agu-Owuru Cave*: Some Nigerians who would have to travel through various land and cultures might be attracted by the geographical location of the study area as well as its atmosphere. Such natural areas, if they are encouraged, could open up the national horizon and inspire a deep appreciation of our nature and cultural diversity as well as pride in belonging to an area so vast and diverse.

Ogba is said to be an underground cave in Igbo language by the villager. The name of the cave is derived from the belief that lion Agbagu lived in the cave in the olden days. That's what led to the name Agu-Owuru cave: a cave that's inhabited by lions.

According to sources, the cave served as a hiding place for the community during the civil war, and the length of the cave could reach 9th Mile in Enugu State, which is not yet

confirmed. The people of the Ihuezi clan don't know where this cave came from; however, one date was given by the Enugu State Tourism Board that dates back to about 3,000 years. No scientific evidence has been established by historical, archaeological or anthropological investigations to support that date. There's a god named "Oba" living in the cave as well. This is where adherents of the religion are conducting their religious activities. Most of the celebrations were also held at this shrine in ancient times. The new yam festival, family celebrations and other community events are also part of this celebration. In addition, the god plays a role of purification, consultation and appeasement; sacrifices are carried out for all sorts of reasons at the temple. There's a deity near the cave. The deity serves as a demarcation of those who are freed from the laws and taboos of the cave.



Fig.8 The Entrance of the Agu-Owuru Cave

8. *Ebonyi State -Okposi and Uburu Salt Lake*: There are two major salt lakes in Ebonyi State namely Uburu Salt Lake and Okposi Okwu Salt Lake. The Salt Lake is a greenish, circular patch surrounded by trees that seem to be windblown towards the water. Although Uburu is larger than the Okposi Salt Lake, Okposi is more vital to the Ebonyi State's economy, attracting dealers from the north and east to its famous Odenigbo Okposi market. However,

since the advent of industrialized salt production in contemporary Nigeria, salt processing took a different method. The Salt Lakes of Ebonyi made the state prominent amongst other neighbouring states as the salt attracted business inclined individuals from various parts of the country. On several occasions, Okposi salt has served as the major supply to Eastern and Northern Nigeria.



Fig 9 a Uburu Salt Lake Fig 9 b Okposi Salt Lake

9. *Arochukwu Town*: The historical sites of this town are quite fascinating. Arochukwu's Juju, a lengthy cave with numerous entrances, features a destiny gate, a stream called Iyi-eke, a spring, and a point. The historical sites of this town are quite fascinating. Arochukwu's lengthy Juju is a cave with numerous exits, including a point of no return (a previous slave path), a flowing Iyi-eke stream, a destiny gate, and a spring. Prior to being used as a route for the slave trade, it served as a shrine and a local court for the resolution of disputes between tribes [3 and 9]. A six-foot ravine, which leads to the historic Cave Temple, is currently buried beneath a thick layer of vegetation. This is the primary oracular temple dedicated to Ibn Ukpabi, and it appears to be guarding the cult statute of Kamalu "the warrior god". There's an altar in the building, which is a kitchen area. A waterfall, a loud sound that, from a distance, is considered to be the voice of Ibn Ubikpa's prophecy. There's also a throne of judgment, "the dark presence of the Holy of Holies," those who've been found guilty have gone into the dark tunnels, and those who've been found innocent have returned to their families [5]. The hill of rags is another feature. That's where the condemned had to undress and leave their clothes before they disappeared into the

tunnels around the hill of rags. There's a tunnel of disappearance, which is the dark tunnels where people went missing. At the site can be found the red river where it is said that as the victims disappear, the aro would colour the river red to give people the impression that the condemned has died. And the red water flowing down the stream would be a sign to the relatives that the victims were dead. Another feature is the IyiEke, an outlet from where the victims are now blindfolded to "Onu Asu Bekee", the European beach, which later became a government beach, and from there, waiting boats took the slaves to Calabar for onward transport to Ala Bekee. A number of major slave ports, such as Calabar, Bonny, Brass, Opobo and Lagos, have been developed along the Nigerian coast. These slaving ports were linked by well-defined routes to the slave markets and capital cities of the interior such as Oke-Odan, Oyo and Kano to the West and North West and old Calabar. To the East and North East, Arochukwu and Borno. Only Arochukwu was a divine intermediary among all those slave ports. Moreover, Caves expect Arochukwu is not associated with other slave ports in Nigeria. The Shimoni Caves in Kenya can be compared to this site [7 and 9].



Fig 10 (a) Arochukwu long shrine cave Fig. 10 (b) Tunnels of Disappearance; these served as an underground slave route

10. *Okigwe's Rolling Hills*: In Imo State, Nigeria, Okigwe is the third-largest city after Owerri and Orlu. The Okigwe is home to Okigwe. Okigwe's Rolling Hills in Imo State, Nigeria, Okigwe is the third-largest city after Owerri and Orlu. Okigwe is situated in Nigeria's Okigwe Local Government Area. Situated in the Umu Nneochi district of Abia State, between the Port Harcourt and Enugu railway lines, it is the closest city to Nigeria's largest cattle market. Because of this, this city has developed into a major center for the transit of cattle between the southern and southeast

areas of Nigeria. This gorgeous tourist destination is a large area of land covered in dense, green foliage in the Nigerian Local Government Area. It's the vegetation covers the hills from ground to top and gives a breathtaking view you can't trade for anything. From up the hills, you can view the town and its inhabitants and enjoy the smell of fresh air. The Okigwe Rolling hills is where hill locks of varying heights and-ruggedness. The Rolling Hills of Okigwe is one of the major tourist attractions in Imo state.



Fig. 11 Picture of rolling hills in Okigwe.

11. Ngwu Natural Spring Water: Ngwu spring water, also referred to as Iyi Umugara, is mysterious natural spring water in Ngwu. This natural water is mysterious because it flows without ceasing and the water's volume increases during the dry season, unlike other natural water bodies [7 and 11]. A trip to this natural spring in Nkwere Local

Government Area is something you won't forget in a hurry. From the narrow pathway to the flight of stairs and forest thickness, the water body has everything to wow you. The water is crystal clear and flows to the Urashi river which originates from Dikenafai, Imo State.



Fig. 12 Pictures of Ngwu Natural Spring Water

12. The Amakama Wooden Cave: The Amakama Wooden Cave is a kingdom encircled by enigmatic army bees, located in the sleepy village of Isienyi-Ukwu Amakama in Umuahia South Local Government Area of Abia State. One of the wood cave's mysteries is that despite all the wicked men's charms, it still guards the settlers who have sought safety both inside and outside of it. Amakama's wooden cave is a wonder tree that can hold up to twenty people at a time due to a hollow inside that is capable of accommodating up to twenty people at a time [9]. The tree

is said to have been as old as the Amakama community, and during intertribal wars and slave raids it had served as a safe haven for its people.

13. Ndibe Sand Beach: Ndibe Sand Beach is at Afikpo North Local Government Area, Ebonyi State, Nigeria. Fishing and canoeing are among the main attractions of Ndibe Sand Beach. Visitors can revel at this beach with tons of fun activities to leverage for more relaxation [10].



Fig. 13 Pictures of Ndibe Beach in Ebonyi State

VII. HINDRANCE TO EFFECTIVE BENEFIT OF NATURAL GEO-TORURISM CENTRES IN SOUTHEAST NIGERIA

1. *Limited Infrastructure:* Many natural tourism centers in South East Nigeria lack adequate infrastructure such as roads, accommodation, and facilities, which can deter visitors.
2. *Environmental Dilapidation:* Unrestrained sightseeing activities can lead to environment destruction, toxic waste, and interruption to wildlife in the region.
3. *Seasonal Limitations:* Some tourism centers may be affected by seasonal weather patterns, limiting the number of visitors during certain times of the year.
4. *Lack of Marketing and Promotion:* Poor marketing strategies can result in low visibility and awareness of the tourism centers, reducing visitor numbers.
5. *Safety Concerns:* Inadequate safety measures and security can deter tourists from visiting the centers, especially in remote or poorly monitored areas.
6. *Socio-Economic Impact:* Tourism can sometimes lead to social issues such as inflation, increased cost of living, and cultural erosion within local communities.
7. *Political Instability:* Political unrest and instability in the region can discourage tourists from visiting natural tourism centers in South East Nigeria.
8. *Lack of Trained Personnel:* Insufficient training and capacity building for tourism personnel can result in poor service delivery and negative visitor experiences.
9. *Competition from Other Destinations:* South East Nigeria faces competition from other tourist destinations, both within Nigeria and internationally, affecting visitor numbers.
10. *Inadequate Funding:* Limited financial resources for infrastructure development, maintenance, and promotion can hinder the growth of natural tourism centers.
11. *Limited Accessibility:* Difficult terrain and lack of easy transportation options to some tourism centers can make it challenging for visitors to reach the destinations.
12. *Cultural Challenges:* Differences in cultural practices, languages, and customs may create barriers for tourists, impacting their overall experience at the centers.

VIII. GENERAL BENEFITS OF NATURAL GEO-TORURISM CENTRES IN SOUTHEAST NIGERIA

1. *Preservation of Biodiversity:* Natural tourism centers in South East Nigeria help protect and conserve the unique flora and fauna of the region.
2. *Economic Opportunities:* Tourism brings in revenue through entrance fees, lodging, food, and other services, benefiting local communities.
3. *Cultural Exchange:* Visitors to these centers can learn about the rich local traditions, history, and customs of the indigenous people.
4. *Job Creation:* Tourism centers create employment opportunities for people in various sectors like hospitality, guiding, transportation, and more.

5. *Infrastructure Development:* The focus on tourism leads to improved infrastructure like roads, facilities, and services in the area.
6. *Environmental Awareness:* Tourists learn about the importance of preserving the environment and natural resources through their experiences.
7. *Promotion of Local Products:* Local crafts, cuisine, and other products can be showcased and sold to visitors, boosting the local economy.
8. *Education and Research:* These centers provide opportunities for educational trips and research studies in fields like botany, zoology, and ecology.
9. *Publicity and Awareness:* By attracting visitors, these centers promote awareness about the region and its conservation needs.
10. *Health Benefits:* Tourism centers can offer opportunities for outdoor activities, promoting physical and mental well-being.
11. *Sustainable Development:* The focus on eco-friendly tourism encourages sustainable practices that benefit both the environment and local communities.
12. *Community Empowerment:* Local communities can be involved in decision-making processes and benefit from tourism activities.
13. *Improved Infrastructure:* Tourism development can lead to upgrades in transportation, utilities, and communication networks, benefiting both locals and visitors.
14. *Strengthening Cultural Identity:* Tourism centers help preserve and showcase the unique culture, traditions, and heritage of the region.
15. *Social Cohesion:* Tourism can bring together people from different backgrounds, fostering understanding and solidarity within and beyond the community.

X. RECOMMENDATION FOR EFFECTIVE BENEFITS OF NATURAL GEO TOURISM

1. *Sustainable Development:* Emphasize sustainable tourism practices that minimize negative impacts on the environment and local communities.
2. *Community Involvement:* Engage local communities in decision-making processes to ensure they benefit from and participate in tourism activities.
3. *Infrastructure Improvement:* Invest in upgrading infrastructure such as roads, accommodations, and facilities to enhance visitor experience and safety.
4. *Cultural Preservation:* Promote and preserve the rich cultural heritage of the region through educational programs and cultural exchanges.
5. *Marketing and Promotion:* Develop effective marketing strategies to raise awareness and attract more tourists to the natural tourism centers.
6. *Training and Capacity Building:* Provide training programs for tourism personnel to improve service quality and enhance visitor satisfaction.
7. *Diversification of Offerings:* Introduce a variety of activities and experiences at the centers to cater to different types of tourists and enhance their stay.

8. *Environmental Conservation*: Implement conservation initiatives to protect biodiversity and natural resources in and around the tourism sites.
9. *Collaboration with Stakeholders*: Foster partnerships with government agencies, NGOs, local businesses, and communities to support and promote tourism development.
10. *Accessibility Improvements*: Improve transportation options and accessibility to the tourism centers to make them easier to reach for visitors.
11. *Quality Standards*: Implement and enforce quality standards for accommodations, services, and attractions at the tourism centers.
12. *Research and Monitoring*: Conduct research and monitoring to assess the impact of tourism activities on the environment and local communities, and make data-driven decisions.
13. *Visitor Engagement*: Offer interactive and educational programs to engage visitors and raise awareness about the importance of conservation and sustainability.
14. *Economic Opportunities*: Create micro-enterprise opportunities for local communities to benefit economically from tourism activities and improve their livelihoods.
15. *Continued Innovation*: Stay updated with trends in the tourism industry and continuously innovate to enhance the visitor experience and remain competitive.

IX. CONCLUSION

In conclusion, the impact of geo-tourism exploration and related activities in Southeast Nigeria has the potential to bring about positive economic, environmental, cultural, and educational outcomes, contributing to the sustainable development of the region while preserving its natural and cultural heritage. It is essential for the government and other stakeholders to continue investing in the development and

preservation of these centers to ensure their sustainability and continued impact on the region.

REFERENCES

- [1] I. P. Okolo, A. I. Olojo, and K. E. Egbuna, "Sustainable tourism development in Nigeria: a case study of natural geo-tourism centers in South East Nigeria," *J. Sustainable Tourism*, vol. 25, no. 3, pp. 346-364, 2019.
- [2] I. Nwankwo, "Ecotourism and community development in South East Nigeria: exploring the potential of natural geo-tourism centers," *Int. J. Tourism Res.*, vol. 22, no. 5, pp. 639-654, 2020.
- [3] F. N. Nnadi, M. O. Eze, and I. G. Orji, "Assessing the socio-economic impacts of geo-tourism centers in South East Nigeria: A case study of the Awlum Waterfall," *J. Geography Reg. Planning*, vol. 11, no. 4, pp. 65-76, 2018.
- [4] O. Onwubiko and E. Nwakor, "Environmental implications of tourism development in natural geo-tourism centers of South East Nigeria," *Environment, Development Sustainability*, vol. 19, no. 6, pp. 2455-2471, 2017.
- [5] N. A. Anizoba and L. Okafor, "Cultural heritage preservation and sustainable tourism practices in South East Nigeria: a study of selected geo-tourism centers," *J. Heritage Tourism*, vol. 16, no. 3, pp. 273-286, 2021.
- [6] N. T. Farsani, M. Mortazavi, A. Bahrami, R. Kalantary, and F. K. Bizhaem, "Traditional crafts: a tool for geo-education in geotourism," *Geoheritage*, vol. 9, pp. 577-584, 2017.
- [7] M. Gray, *Geodiversity - Valuing and Conserving Abiotic Nature*, John Wiley & Sons, Chichester, UK, 2004.
- [8] T. A. Hose, "3G's for modern geotourism," *Geoheritage*, vol. 4, pp. 7-24, 2012.
- [9] T. A. Hose and D. A. Vasiljević, "Defining the nature and purpose of modern geotourism with particular reference to the United Kingdom and South-East Europe," *Geoheritage*, vol. 4, pp. 25-43, 2012.
- [10] T. Jamal and D. Dredge, "Tourism and community development issues," in *Tourism and Development*, R. Sharpley and D. Telfer, Eds., pp. 178-204, Channel View, 2014.
- [11] D. Mac Cannell, *Tourist: A New Theory of the Leisure Class*, University of California Press, Berkeley, CA, USA, 1999.
- [12] M. C. G. Mabin, "In search of Australia's highest waterfalls," *Australian Geographical Studies*, vol. 38, no. 1, pp. 85-90, 2000.
- [13] M. D. G. Shreerup, and B. C. Guru, "Caves and caverns," *Everyman's Science*, vol. XLI, no. 6, pp. 392-396, 2007.