Harnessing the Tourism Potentials of Abia State using Advanced Geospatial System Techniques-A Review

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KEYWORDS: Tourism and Hospitality, sustainability, Advanced Geo-Spatial techniques.

SUMMARY

The Nigerian Tourism business is a very huge business that offers a lot of possibilities in terms of finance generation, employment and re-positioning of the country's image internationally. The Nigerian tourism industry is currently undergoing serious re-organization and restructuring as it is evident in the establishment of different tourism agencies and the increasing rate at which new hospitality centers are springing up at different locations in the country. Abia State of Nigeria is blessed with many tourist potentials like the Azumini Blue River in Aba, Ojukwu Bunker located at Umuahia, the long Juju of Arochukwu, the National Museum also in Aba and so many other areas of tourist interests and captivating scenes. Despite all these, reasonable efforts have not been put in place by stakeholders to arouse and attract the interest of tourists to the state. This work is aimed at exposing the hidden tourist potentials of Abia State of Nigerian through use of advanced geospatial system techniques such as Global Positioning System, Remote Sensing techniques and digital database to provide better tourism details and broader description of tourist attractions sites in Abia State. The Production a digital tourism and hospitality map of Abia will go a long way to improve the Tourism potentials of Abia State for sustainability.

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1. INTRODUCTION

Tourism is widely recognized as one of the World`s largest industry that focuses primarily on leisure, business, travel activities and centers around visitor`s movement to a particular destination. It is highly dynamic and is influenced by economic, political, social, environmental and technological changes. The success of tourism and hospitality industry in any country depends on the ability of that country to sufficiently develop, manage and market the tourism facilities and activities of that country as most developing countries depend mostly on tourism for economic growth and diversity. The Nigerian Tourism industry is a very huge business that offers a lot of possibilities in terms of finance generation, employment and re-positioning of the country image internationally. Ayeni et.al(2001), observed that with a population of 120 million people made of about 300 ethnic groups, a vast land of about 1 million beautiful coastland of about 835km, a rich diversity of cultural and ecological resources, Nigeria appears destined to be the "Giant" of Africa as far as tourism is concerned. Popular tourist attractions in Nigeria are depicted in the table1.0 below: Table 1 Major Tourist Attraction in States in Nigeria

s/n	Name of Tourist Attraction	Location
1.	Arochukwu Cave	Abia
2.	Ojukwu Bunker	Abia
3.	Zuma Rock	Abuja
4.	Mandara Mountain	Adamawa
5.	Tinapa Resort	Cross River
6.	Gurara Falls	Benue
7.	Wild Warm Spring	Bauchi
8.	Jos Wild Life park	Plateau
9.	Obudu Cattle Ranch	Cross River
10.	Bukolori Dam	Niger
11.	Ushogo Hills	Osun
12.	Samorika Hills	Osun
13.	Okirika Aquatic Stadium	Rivers State
14.	Old Oyo National Park	Oyo
15.	Ogbunike Cave	Enugu
16.	Aminu Kano Airport	Kano
17.	Nnamdi Azikiwe Int. Airport	Abuja
18.	Egeneja Warm Spring	Kogi
19	Yankari Game Reserve	Bauchi

Source: (Modified after Ayeni, 2001)

The Nigerian tourism industry is currently undergoing serious reorganization and restructuring as can be seen in the establishment of different hospitality centers throughout Nigeria. Abia State has many tourist sites such as the Azumini Blue River in Aba, Ojukwu Bunker at Umuahia, the long Juju of Arochukwu, the National Museum also in Aba and so many other areas of wonderful tourist attraction. Despite all these, good efforts have not been put in place by stakeholders to arouse and attract sufficient number of tourists to the state.

Tourism, therefore, is 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 places visited (UNWTO 2000). In the same vein, the Association of Scientific Experts on Tourism (AIEST) noted that as long as the travel do not lead to permanent residence, it is termed tourism. Tourism activities may involve the following:

- Movement of people from one place to another.
- Tourism embraces the journey to stay at a particular destination.
- Tourism takes a tourist outside his/her normal home or place of residence.
- The movement may be a short time type and the tourist hopes to return at the end of the exercise.

Some identifiable tourism activities include:
- Domestic or local tourism involving tourism within a defined geographical location
- Inbound tourist which involves visits within place of natural birth or permanent residence.
- Outbound tourist which involves visits outside ones country of residence.

2. POLICY TRUST FOR TOURISM DEVELOPMENT IN NIGERIA

The institutional framework for the organization of tourism in Nigeria was set in 1962 with the formation of Nigeria Tourist Association. The Federal Government of Nigeria then promulgated decree No. 54 of 1976 which established the Nigeria Tourist Board, while the states in turn established States Tourist Committees. The Nigerian Tourist Board was responsible for tourism development in Nigeria. It played advisory role in the tourism development programme and also guaranteed the federal government policy formulation in the sector.
In 1990, new policy on tourism was developed. The policy defined the role tourism sector should play in the improvement of the Nigerian economy. It includes:
- foreign exchange generation;
- promoting tourism based rural enterprises,
- generating employment and accelerating rural/ urban integration and
- Promoting cultural exchange.

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The National Tourism policy(NTP) came into being in 1990 and subsequent gave birth to the Nigerian Tourism Development Corporation (NTDC) in 1992.The establishment of the national institute for Hospitality and Tourism(NIHOTOUR) in Buganda Kano and National Travel Bureau(NTB), a tour operating company of the NTDC(Igboanugo,2009).

The tourism policy initiative encouraged both domestic and foreign investments in the tourism sector of the Nigerian economy. These measures and policies were aimed at making Nigeria the ultimate tourism destination in Africa and consequently improve the revenue generation and encourage diversification of the economy.

3. GEO-INFORMATION AND SPATIAL TECHNOLOGY ROLE IN TOURISM

Geoinformation (GI) Technology includes disciplines like Cartography, Photogrammetry, Satellite Remote Sensing, GIS, Land Surveying (including GPS) and other earth related technologies. For centuries now, these disciplines have grown in a manner which gave each of them special identity. Professional bodies were formed related to each of these disciplines. In the recent past, particularly in the last decades of the previous century, the borders between various disciplines related to earth sciences showed fading signs. Information flow has to be free from hassles. Flow of information and capital produce flows of people (Brimicombe, et al., 2009). ICT have allowed the dispersal of some activities and the agglomeration of others-a reshaping of cities and our working and leisure patterns. Castells et al., (2006), opined that the globe has become a "mobile network society". The mobility of the people together with mobility of information, capital, risks and objects can produce creativity, innovation, wealth creation and freedoms. On-line mapping services such as MapQuest and Google Maps have also become big business as users seek out maps and navigation instructions on how to reach geographical destinations.

Remote Sensing, Photogrammetry, Geographic information System(GIS), Global Positioning System(GPS),Cartography and other related technologies have emerged as complementary technologies providing integrated and total solutions to most of the planning and development issues(Kummar,2000).Geographic information systems (GIS) were identified as one of the underlying technologies that are specific to organizing,handling,design and application of the technology. This is generally referred to as GI Science. Goodchild (1990, 1992) put forward two main conditions for the recognition as a particular branch of science:

- – That the knowledge domain contained a legitimate set of scientific questions;
- – That spatial data were unique from other forms of data and therefore needed special consideration

Central to nearly all forms of measurement and mapping is the Global Positioning System (GPS).Initiated as a programme in 1973 by the United States with the first satellite launched in 1978; GPS has become indispensable for geographical positioning and navigation. GPS is based on a constellation of 24 satellites that orbit the Earth at an attitude of approximately 20200km.Radio signals are emitted by the satellites over a number of frequencies that can be

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picked up by receivers regardless of weather conditions, time of the day or position on the Earth. Generally, the signals from three satellites are required for dependable 2-D(x, y) position fix and from four satellites for 3-D (x, y, and z) position fix. GPS receivers have undergone considerable miniaturization such that they can now be integrated into mobile phones (Brimicombe, 2009). The general design principles of the GPS can be summarized as follows:
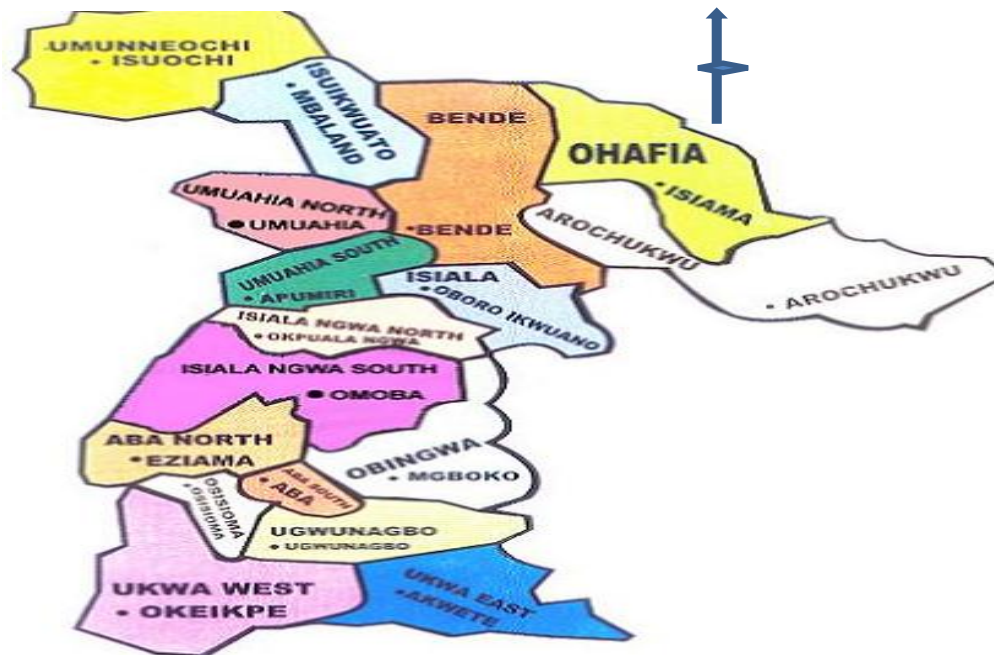
- Suitable for all classes of platforms whether they be aircraft, ships or land-based vehicles as well as other satellites;
- Provide positioning in real-time along with the ability to determine the time and velocity;
- Reference all positioning to a single global geodetic datum;
- Capable of preferentially providing higher accuracies to certain classes of users (military application).
- Have low unit cost(it is in fact free to use) with low power overhead;
- Scalable to unlimited numbers of users worldwide.

Satellite imaging for civilian purposes started in the 1960s with metrological satellites but quickly followed in the early 1970s by satellites with imaging systems designed to observe the Earth's surface rather than its atmosphere. Remote Sensing can be defined as the acquisition of data about the objects using a sensing device that does not require direct contact with objects themselves. These technologies have actually reshaped the way and manner geospatial business is handled now. Our desire here is to explore the capabilities of these technologies in harnessing the rich tourist potential of Abia State for sustainability.

3. SPATIAL DISTRIBUTION OF TOURISM SITES IN ABIA STATE

Abia State is a state is located in the South East Geo-Political Zone of Nigeria. The capital is Umuahia, although the major commercial city is Aba, formerly a British colonial government outpost. Abia State lies within approximately latitudes 4° 40' and 6° 14' north and longitudes 7° 10' and 8° east. The state shares common boundaries to the north with Ebonyi State; to the south and southwest with Rivers State; and to the east and southeast with Cross River and Akwa lbom States respectively. To the west is Imo State, and to the northwest is Anambra State (Abia official Website, 2013).
The Population is estimated to be about 3,000,000 (NPC, 2009).The state covers an area of about 5,243.7 sq. km which is approximately 5.8 per cent of the total land area of Nigeria. Mineral resources found in the state include petroleum, natural gas, lead and zinc.

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Fig 1.0: Abia state of Nigeria (Source: Abia Govt. house press, 2010)

Abia state tourist attractions have been classified into four major categories:
- Nature induced attraction sites
- Human created attraction sites
- Cultural attraction sites
- Social attraction sites (Aji, 2012).

Most Abia tourist destinations sites have not been harnessed or explored; also the facilities in some of these sites have not been upgraded to world class standards.

3.1. Tourism and The Economy of Abia State

Agriculture is the major occupation of the people of Abia State. This is induced by the rich soil which stretches from the northern to the southern parts of the state. Farming in the state is determined by the seasonal distribution of rainfall. The main food crops grown are yam, cassava, rice, cocoyam and maize while the cash crops include oil-palm, rubber, cocoa, banana and various types of fruits.

There are three agricultural zones in Abia State: Aba, Umuahia and Bende. All these areas are good repository of tourist attraction sites and hence can actually improve the revenue base of the state if properly harnessed.

3.2 Tourism Infrastructural Challenges in Abia State

Some of the identified infrastructural needs are of the state includes:

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- Transportation
- Communication/ Broad Band Internet Facilities
- Accommodation
- Power/Electricity
- Health Facilities
- Security

3.3 Major Tourist Attractions in Abia

The major tourist attractions in Abia State include the following:
- Isiukwuato water fall in Umuogwugo (Isiukwuato LGA)
- Azumini Blue River in Ukwa East LGA
- The long juju of Arochukwu
- War Museum
- Amakama cave Amakama Umuahia South LGA
- The Ohafia war dance
- Textile weavers of Akwete
- Other caves

3.2.1 Isiukwuato Water Fall

This site is located between Umuobiala and Umuasua in Isiukwuato Local Government Area. The water fall is located at Latitude 05^0 43′ 02 0′ N and Longitude of 7^0 29′ 08′ 0′ E with highest point of about 203m above mean sea level.
Osowuruwuru in Umuogwugo village is a good tourist site in Abia State which is yet to be explored. It is highly respected and sacred in the village and it has a cave where disputes are settled. Also located close to this site is the "**Nkumempakwasi**" meaning attachment rock which is used as colonial stamp during the colonial era. This is the main source of some river in Nigeria including Akwa Ibom River.

3.2.2 Azumini Blue River

Azumini town is located at the South-South part of Abia State bounded by the Akanu village in the North, by the South and East by the Aannangs and the Annangs are positioned east of the Abia Azumini which empties itself into the Imo River after a village called Akpala. The Azumini Blue River is a tributary of Aba River usually called water side River. It is called Blue River because of its crystal and bluish quality. The challenge here is that the Blue River has not been fully developed and utilized.

3.2.3 The Long Juju of Arochukwu

This is found in Ibina Ukpabi in Arochukwu. It is a cave with a long dark tunnel that is associated with the slave trade. Prior to the slave era, it had served as a court of arbitration for the settlement of local, tribal and inter-tribal disputes and problems. Some people believed that the gods speak to people through the long metal pipe found there. The long juju has gained international recognition because of the enviable role the Long juju played during the slave trade expedition.

3.2.4 National War Museum

This is located at the heart of Abia State, Umuahia. The museum contains necessary information on the past military events and civil war in Nigeria. The museum is amongst the best in Africa because of its currency and updated information.

3.2.5 Amakama Cave

This is a wooden tree with a hollow inside that is capable of accommodating up to 20 people at a time. The tree is claimed to be as old as the Amakama community and has acted as a soft haven to the community during inter-tribal wars and slave trade. The serene environment of the site is good for the construction of a standard tourism village.

3.2.6 Other Caves

Many caves are located within the state from Umunneochi to Arochukwu and these include the following:
- Ngodo cave at Ngodo Isuochi, which has both stalactite and stalagmite inside.
- The Uluchukwu cave at Ahaba/Imenyi in Isiukwuato in Isiukwuato LGA.
- The Uluchukwu Abiama cave at Amankalu Alayi in Bende   LGA
- The Eziofia cave at Amekpu Ohafia
- The Onuibina cave at Ihechiowa in Arochukwu LGA

It is believed that the Uluchukwu cave, Abiama cave and long juju cave (ibini ukpabi) were once residence of Chukwu Abiama/obioha the kind hearted deity that once wielded great powers of arbitration.

4. ANALYSIS OF ABIA STATE TOURISM OBJECTIVE

This is aimed at:
- Making critical inventory of all existing and potential tourism sites in Abia State.
- Examining the state of the tourist infrastructure at the various identified sites in the state.
- Recommending to the Stakeholders dynamic strategies for improvement of tourism in Abia state.

4.1 Strategies for Tourism Sector Development

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The managing of environments for tourism depends not only on the right information compilation and dissemination but quite significantly on articulating our unique cultural and natural environmental features and processes that make them distinctive from the rest of the world (Choker 1993). Therefore, the policy and programme managers must develop a holistic view of the inter linked nature of tourism with culture, environment, economy, social practices and life styles. Care should be taken so that cherished values and way of life established over the years by our forefathers are not destroyed.

4.2 Socio-Cultural Issues

Abia state must be ready to accept foreigners as visitors in the local communities. The local communities in the state should also be ready to sell or market aspects of their culture, social life and surrounding natural environment to tourists. These will include available wide life species and unique cultural/natural landscapes.

4.3 Economic Issues

The growth of the tourism industry in Abia state will be enhanced by the establishment of appropriate tourism related economic activities. This will provide the necessary elixir or boast effective participation in the industry. Hence, there is need for partnership with the local communities, investors and others.

5. USE OF ADVANCED GEO-SPATIAL TECHNIOUES IN HARNESSING TOURISM POTENTIAL OF ABIA STATE (METHODOLOGY)

Every object present on the earth (including tourist sites in Abia State) can be geo-referenced. This is the fundamental key of associating any database (identified locations and spatial attributes) to GIS. Here, the term database is a collection of information about things and their relationship to each other, and geo-referencing refers to the location of a layer or coverage in space defined by the convenient co-ordinate referencing system.

Work on GIS began in late 1950s, but first GIS software came only in the late 1970s from the lab of the Esri.Gis technology integrates common database operations such as query and statistical analysis with the unique visualization and geographic analysis benefits offered by maps. Functional capabilities of GIS include the following:

- Data entry, storage and manipulation
- Data base integration and management
- Data queries and searches
- Spatial Analysis
- Map production
- Decision making support

Basic questions that are integrated into a Geo-database and GIS environment are:
- What is it? (location based query)

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- Where is it?(conditional query)
- What has change?(Trend)
- What is the best route or alternatives?(Routing)
- What is the pattern?(Pattern)

5.1 GIS in Tourism

Ayeni (2006) observed that the use of pictures, sounds, and graphical data would aid the development of the tourism sector (Igboanugo, 2009). The production of the tourist map of Abia state would involve the following steps:
- Compilation and addition of textual information to features location
- Development and editing of pictures and images to text labels
- Hot linking of images to their respective features using Arc GIS software.

Sources of the tourism data for the data base design include:
- Existing map of Abia State
- Abia State street Guide Maps from OSGOF
- GPS Data
- Other Ancillary Data
- Photographs of Tourist Sites in the State, etc.

5.2 Geodatabase Design

To effectively implement a tourist Geodatabase of Abia State, a solid database design must be put in place. Designing a Geo-database is an essential process that requires planning and revision until a final data model is developed that meets the tourists' requirement of Abia State. Societies and their government need to become spatially enabled in order to have the right tools and information at hand to take the right decisions (Steudler, et al., 2012)
Tourist Geo-data base design involved a six step process: Below is the GIS data base modeling process after Igbokwe (2010):
- Reality
- View of reality
- Conceptual Modeling
- Logical Modeling
- Physical Design
- Spatial Database

5.3 Coordinates Listing of Some Tourist Sites in Abia State (UTM)

Depicted on table 2.0 are some identified tourists' sites and their location co-ordinates gathered using handheld Garmin GPS listed in their UTM values:
Table 2.0 Some Tourist Locations in ABIA STATE.

s/n	Name of Tourist sites	E(m)	N(m)	Remarks
1	Ngodo Cave	321671.902	662670.980	
2	Ojukwu Bunker	344361.206	611472.893	
3	Uluchukwu Ahaba	336094.232	632108.751	
4	Uluchukwu Abiama	343997.116	631763.892	
5	Eziofia Cave	364001.590	628091.320	
6	Onubine Cave	331302.097	604719.986	
7	Ohafia War Dance	366901.301	623273.503	
8	Long juju	366998.696	602836.753	
9	Azumini Blue River	331482.342	547037.565	
10	Isikwuato Water Fall	333493.569	633132.631	
11	War Museum	332509.321	615887.943	
12	Akwete Textile	317544.394	541131.743	

(Source: Author's Field Work, 2012.)

For effective design, implementation and declaration of the Tourism Geo-database of Abia State, the following steps as contained in Ayeni et.al (2002) would be adopted in the final stage:

- Conversion of the analogue map to digital format by scanning and digitizing and subsequently creating shape files using A0 scanners, Digitizers and using ArcGIS 9.3 software.
- Creation of relational database with attributes in ArcGIS environment
- Creation of database with capabilities of querying.
- Conversion of all pictorial files, video clips and sound into wave files and AVI format
- Hyperlinking Multimedia file and GIS data base.

5.3 RESULTS: The aim of every GIS project is to aid in decision making process. This review is to show how tourism can be supported by the technical production of digital maps using GIS techniques. The project when it is finally accomplished, would deliver the following:
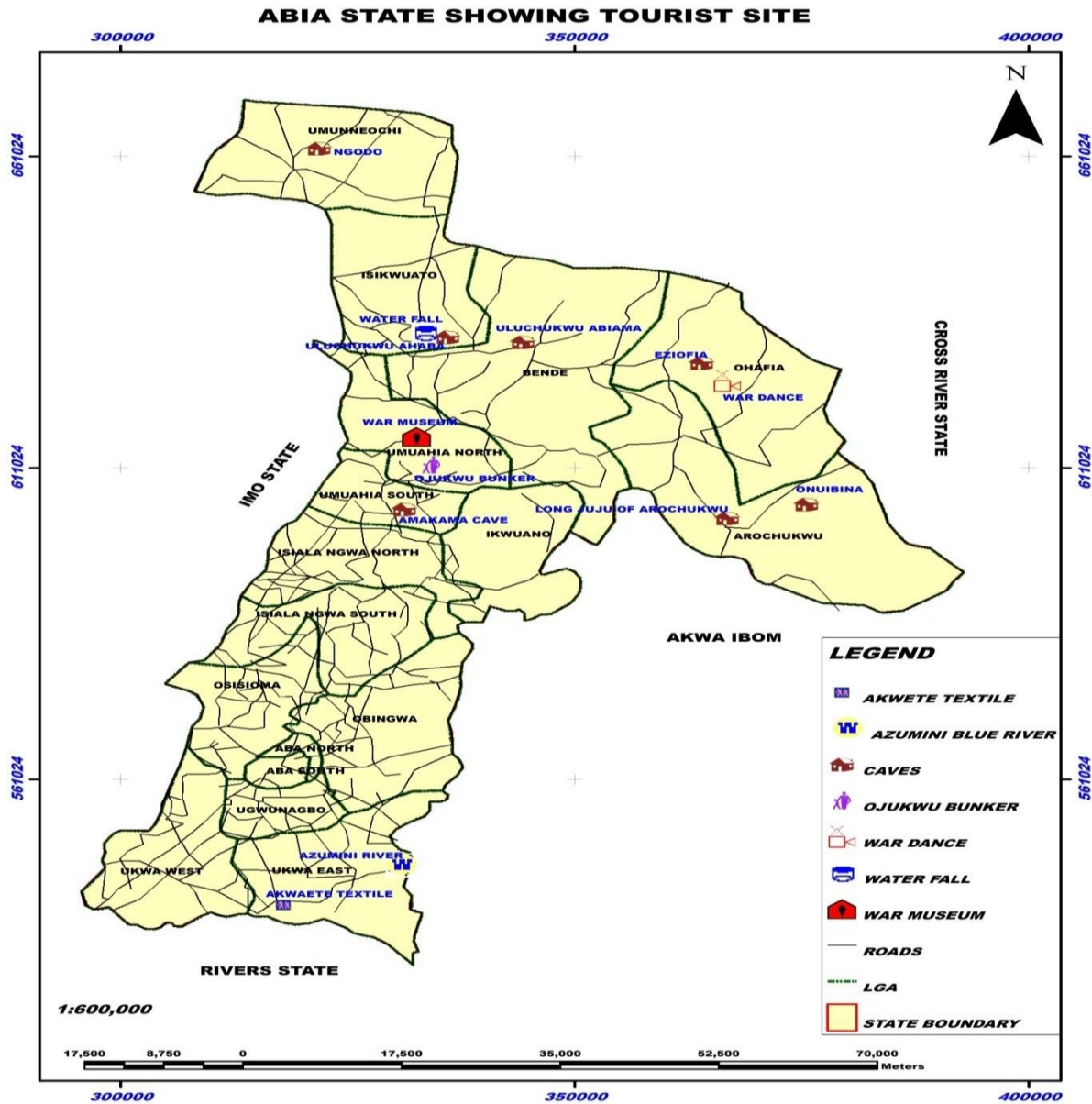
- Maps, graphics, pictures and tourism guides of Abia State in different formats (Analogue and Digital formats).
- It will also deliver textual information, descriptions of routes and locations of tourist sites and other interest areas in Abia State, etc.
- If appropriately funded, we do hope to develop a model or pilot tourism web site for the state.

6.0 CONCLUSION AND RECOMMENDATION

6.1 CONCLUSION: Enhanced accessibility, reduced cost to users and awareness will ensure maximum participation of the people of the state in tourism activities. There is a need for the development of a master plan for the development of tourism in Abia State. The master plan will provide:

- A guide for the holistic development of the sector in view of the multiple linkages to other sectors of the economy.
- The plan will provide a clue to the right type of tourist facilities to be developed in the different local areas of the state.
- The plan will provide a blue print for private sector participation in the tourism industry.

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- The plan will provide the background infrastructural facilities that will enhance the development of potential tourist sites at any location within the state.
- It should also outline plans to effectively involve host communities in both the development and the enjoyment of benefits of such investment.
- Finally the state should liaise with the National Tourism Development Commission to market the development plan to attract foreign direct investments in the sector.

Fig 2.0 Map of Abia State showing some Tourists sites

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(Source: Chigbu et. al., 2013)

6.2 RECOMMENDATIONS: For Abia state to achieve meaningful breakthrough in the tourism business the following recommendations are necessary:

- Government must be willing to embrace digital technology and spatially enable administration.
- There is need to reposition the Surveying and Mapping agencies of the state in line with the present realities and global best practices.
- There is urgent need for capacity development and training of needed manpower to drive the repositioned tourism business of the state.
- There is an urgent need for the government to put in place all necessary security measures to combat crime and all forms of negative vices that will hinder the growth of the industry in the state.
- Necessary infrastructure must be put in place such as constant supply of power, good hospitality centers, good communication network and access to the internet and accessible road networks.

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