Sustainability approach to Tourism and its Development within Cross River State, Southern Nigeria with Geospatial Techniques

Mfoniso Asuquo Enoh[1], Nnam Uchechukwu Godwin[2], Thompson S. Okoyen[3]

Department of Geoinformatics and Surveying, University of Nigeria Enugu Campus Nigeria[1]
Department of Surveying and Geoinformatics, Enugu State University of Science and Technology, Enugu Nigeria[2]
Department of Climate Change, Ministry of Environment, Baylesa Nigeria[3]

Abstract
Today, tourism is one of the most important industries which contributes to more than ten percentage of the world's GDP. The industry is important because of the amount of income it brings into many countries as well as the ways it aids interconnection throughout the world. In Africa, tourism is an important sector which play a vital function in the continent's development as well as generate foreign revenues. However, sequel to lack of update and efficient maintenance of available data, the tourism industry faces a lot of setback, mostly in developing countries, and could go extinct with time. The problem of inadequate update and efficient maintenance has caused the Government of the various developing countries to loose enormous revenues which would have aided the necessary infrastructure in improving the people's standard of living as well as their way of life. This set back in tourism industry in developing countries such as Nigeria, has made it difficult for these countries to be listed as major tourist attractions in the world. Therefore, this study sees the need to correct that effect and thus aims in mapping and development of a geospatial database to attract in Southern Nigeria, Cross River as a case and adopting the Geographic Information System (GIS) approach. To achieve this aim, Global Positioning System (GPS) receivers and the base map were utilized to create various coordinates of tourism locations as well as for geo – referencing and to update already existing maps. The result of the database queries showed the location of tourist attractions in Cross River State, which can be visualized in the Arc – GIS environment. The study also shows that GIS techniques can be adopted for mapping as well as for development of tourism areas with the aid of maps. Thus, this study therefore recommends continuous updating of the database with time, and as development process in the study area, so as to acquire new tourism areas within the study area.

*Keywords***:** *GIS, Tourism, Database, Cross River State*

I. Introduction

Today, tourism is one of the most important industries, as many developed and developing countries of the world are exploring the potentials of tourism.   The Organization of World Tourism (1995), is of the option that tourism involves people moving from one place to the other, which is outside their homes for a duration, not less than twenty four hours and not more than one calendar year. The Organization further expounded that the movement, the tourist makes must be for business, for leisure among others and not for seeking employment. Cooks *et al.* (2006) highlight that the visit of a tourist must be temporary or short, and must not be a place of the tourist's employment. Tourism could be domestic or international.   While domestic tourism involves the tourist travelling within their country, international tourism is viewed as a tourist movement outside his home town or country. Okpoko et al (2008) highlight five notable characteristics of tourism as follows: The migration of people to places outside their residents and for pleasure; the movement to and the stay occur outside their place of resident; the movement must be more than twenty – four hours and not more than one calendar year.   The researchers were also of the view that the movement the tourist exhibit outside their home and which is not up to twenty – four hours is known as excursion. The researcher further explained, that during excursion, the tourist visit is brief and its intention is to return back home, after the visitation. In excursion, the money, the tourist spends must be obtained from home and not earned in the destination.

Several studies have expounded that in many advanced countries of the world, tourism is the chief source of foreign exchange. Tourism in these advanced countries, aid in developing other sectors of the economy through multiplier effect. Okonkwo *et al* (2010) is of the opinion that in developing countries, tourism is now the greener pastures, with attention sequel to several benefits by providing jobs, infrastructural as well as generating revenue for the countries hosting the tourists. In Nigeria, Oladipo (2010) quoted that tourism is one of the fastest growing industries, which is yet to be fully exploited. Oladipo idea of tourism was proven true, as the industry contributes to only 3% of the GDP of Nigeria (Tourism Mastermind Plan of Nigeria, 2006). In Cross River State, tourism is geared towards the diversification of the state based industry as well as providing an alternative approach to generate internal revenue. Cross River State is blessed with several tourism attraction centres. Owing to this, the state prides itself as one with the largest tourism attraction in Nigeria and in West Africa, where tourists/visitors troop in especially during the festive periods.

II. Overall Concept of Geographic Information System (GIS)

"Geographic Information System" is acronym as GIS and it is an information system which merges the following disciples: geography and computer science as well as mathematics with statistics and management, surveying and mapping into a single unit. It is a computer based system, which consists of the hardware and software utilized to collect, map out as well as analyze, store so as to retrieve and display the various spatial and non – spatial information from geographical world so as to be utilized for a given purpose (Fellaman *et al.,*2008). The information system "GIS" can also be categorized as a software to link geographical information (such as *where things are* located) and with described information (such as *what things are* located). It is worthy knowing that "GIS" can expound various layers of information as compared to a hardcopy paper, which visualize information as we can see. The hardware aspect of Geographic Information System can be categorized as equipment, which are composed of external devices, such as input and output equipment, data storage as well as transmission systems. Wheatley *et al* (2002) noted that GIS could be categorized as a database package with the capacity for a specific referenced information. Chikwanda (2004) stated that GIS can be a computer device which can be utilized for collecting and managing data as well as for retrieving

such data earlier collected. Pick (2005) stated that GIS can be developed through four phases which are directly or indirectly related to the development of hardware and software support and as follows:

(i) GIS is a technique for monitoring geographic phenomena and processes;
(ii) The creation of the GIS software packages and acceptance of GIS as a tool for effective monitoring of geographic phenomena and processes at the national level;
(iii) The development of computer hardware and software packages which enhances the spatial analysis and introduces the modelling and visualization.
(iv) The introduction of GPS as a technique for collecting, distributing and displaying data.

III. Application of Geographic Information System in Tourism attractions

Geographic Information System (GIS) finds application in tourism as a notable tool for planning and for taking in the world of tourism. This tool "GIS" has also been applied in many other discipline such as geography, forestry, urban development and planning as well as in environmental studies. With GIS, information associated with tourism can be merged, and then visualize so as to present the ideas thereof and then obtain results. Tourism utilized GIS in to determine the suitability of sites for tourism development (Ssferovic and Stankov, 2009). Researchers such as Bahaire *et al* (1999) highlight the capacity and ability of GIS tool and relate it to tourism as seen in table 1 below (see table 1). GIS allows users to enter enquires so as to explore maps, analyze geographic locations, retrieve information which are associated with locations as well as obtain the information in hard copy. The database created with the aid of GIS answers the following frequently asked questions.

(i) Where can the locations of a tourist be located?
(ii) What route is the shortest, for a tourist to get to its location?
(iii) How can the geographical area of the tourist location be categorized?
(iv) What time of the season is suitable for a tourist to travel?
(v) What type of housing are available for a tourist during their visit?
(vi) What is the pattern of the social infrastructures associated with a tourist and its products?
(vii) Where do shopping centres, ATM machines and park exist in the area located?

Table 1: Capacity of a design Geographic Information System

Functionary capacity of GIS		Questions associated with GIS			Applications of Tourism	
1	Data input, storage and manipulation ability			1	What is at?	1	Tourism and associated Invention
2	Production of various maps	1	Location	2	Where is it?	2	Identification of areas and zones suitable for development purpose
3	Integrating and managing of the Database	2	Condition	3	What has changed?	3	Measurement of the impact of tourism
4	Queries associated with data and information	3	Trend	4	Which is the best route?	4	Management associated with visitors
5	Spatial analysis	4	Routing		What's the	5	Analyzing the proximity of various use of resource
5	Spatial analysis	5	Pattern	5	type of pattern?		
6	Spatial modelling	6	Model	6	What if it is?	6	Analyze the impact of development associated with tourism
7	Decision support						

Source of Information: Bahaire *et al* (1999)

IV. Contribution and Influence of Tourism

A. Socioeconomic and Environmental Influence of Tourism

Tourism has lots of social and economic impact on the host community. Dyer *et al* (2007) stated that the influence of tourism is acknowledged on the economic and social benefits as well as the cost of tourism on the lives of the people. Glasson *et al* (1995) is of the view that tourism industry could aid regional and national development which can promote foreign exchange, employment, balance of payment and infrastructure etc.

B. Contribution of Tourism to employment

Tourism has greatly influence the rate of employment, especially in developing countries of the world. Ezenagu (2013) is of the option that tourism is one of the sectors, with a large employer of labour, as it create employment for millions of people. It is an industry that provides employment for more than 98 million people, thus representing 3% of the total world population (Turner and Sears, 2014). In Australia, Tunde (2012) noted that tourism reduces employment up to 4.7%, and then establishes infrastructures and facilities such as transport, lodges, camps, retails and whole sale companies in Nigeria.

C. Contribution of Tourism to Foreign exchange earning

Obeta et al (2013) stated that the tourism industry is the major source of foreign earning for more than 38% countries globally. In Nigeria alone, tourism is geared toward improving her foreign exchange. Ezenagu (2013) is of the option that tourism is a source to generate foreign exchange. The researcher stated that tourism is recognized as the third sector which promote foreign exchange in Ghana. In Kenya, tourism is viewed by many researchers to promote tourism up to US $ 128 million as well as account for almost 5% of foreign exchange in Tanzania.

D. Influence of Tourism on Infrastructural development and other Sectors

Tourism has great influence on infrastructure development as well as in other sectors, which include agriculture, health, education, aviation, transport, environment and oil/gas etc. Ezenagu (2013) is of the option that the tourism industry is associated with multiplier effect which rub other sectors which are often associated with it. Bankole (2002) noted that during visit, tourist patronizes locally made products and arts such as hats, ornaments, baskets, and wooden

carving, thereby improving the standard of living of the host areas. Through tourism, infrastructures such as electricity, portable drinking water, hospital, schools and rural roads have been greatly improved.

V. Related Studies

Several studies have stated that GIS find applications in the design and development of a database for tourism attraction. Baviskar (2017) designed and developed a GIS database for tourism in Aurangabad. He showed that database design using GIS to aid tourism in Aurangabad, can be produced by locating tourism sites and zones by adopting the base map and global positioning system (GPS). Shah *et al* (2015) applied GIS technique to aid tourism in Sringar. Their study showed that GIS tool could aid maps and various tourism centres in Sringar. Researchers such as Feick and Hall (2000) highlighted that GIS is applied in various areas such as visitor assessment and recreation, wildlife as well as tourism management. Jovanovic and Ngegus (2008) stated that GIS is an application utilized in the design and application of tourism areas, on locations such as Zlatibor and Zlatar situated in Serbia. In their study, Seker *et al* (2002) expounded that GIS could in planning for tourism in locations such as Manavgat, a city in South area of Turkey. In Nigeria, Thecia *et al* (2014) carried out a study, where they designed and developed geospatial database to be utilized for tourist in Anambra State. The researcher produce the geospatial database of Anambra by using roads, tourism features with base maps and the GPS. Fadahunsi (2010) stated that GIS is utilized for tourism management by creating awareness of the existence of the tourist attraction centres in Osun State. Similarly, Omitogun and Oyinloye (2008) carried out a study in Osogbo, a grove situated in Osun State by using Geospatial techniques so as to acquire grove registered on Tourist map. Ayeni (2006) successfully produced a multimedia database using GIS technique to produce tourist maps in Nigeria. The researcher made the databse solely for educational purpose in Nigeria. Another researchers, Fajuyigbe *et al* (2007) designed a geospatial database to include tourism in Oyo State, Nigeria. Their study shows that tourism database could aid and promote tourism in Oyo State, Nigeria.

VI. The Study area – Cross River State

Cross River is a state situated in the coastal zone, in the southern part of Nigeria. It shares boundaries with states such as Benue in the North; Enugu and Abia in the West; Akwa Ibom in the South as well as by the Atlantic Ocean and the Cameroon Republic in the East.

Cross River State occupies an area of 20,156 square kilometers. It is bound within latitudes $4^0$15'N and $7^0$00'N and longitudes $7^0$15'E and $9^0$30'E. It is made up of 18 Local Government Areas. Table 2 shows the 18 Local Government Area within the study area and their respective headquarters.

Table 2: Local Government Area in Cross River State and their headquarters

LGA	Headquarters	LGA	Headquarters
Abi	Itigidi	Etung	Effraya
Akamkpa	Akamkpa	Ikom	Ikom
Akpabuyo	Ikot Nakanda	Obanliku	Sankinla
Bakassi	Ikang	Obubra	Obubra
Bekwarra	Abuochiche	Obudu	Obudu
Biase	Akpet Central	Odukpani	Odukpani
Boki	Boje	Ogoja	Ogoja
Calabar Municipality	Calabar	Yakurr	Ugep
Calabar South	Anantigha	Yala	Okpoma

The headquarters of the study area is Calabar. The "Cross River" is the major river situated in the state, which drain into the Bight of Biafra. The study area – Cross River State derive its name from this river, which is known as Oyono and which flows across the state.

A. Demographics

The study area "Cross River State" has many ethnic groups. Among these ethnic group, the notable ones are: the Efik tribe; the Ejagham tribe and the Bekwarra group of people. The Efik tribe are groups of people who speak mainly Efik language and live mostly in the following Local Government Area of the state: Calabar Municipality and South as well as in Akpabuyo, Bakassi, Odukpani and in some sections of Akamkpa, a Local Government Area situated in the state. They Qua group of people, also live in Calabar areas, and they speaks Ejagham. The majority of the Ejagham people also exist in the northern part of the study area. Another group, located north of the state's capital are the Ekois people. Ekois are people of Biase found in Biase LGA as well as in Akamkpa. (Categorized as Oban) and Bahumono, situated in Abi LGA. Yakurr/Agoi group of people also exist in Yakurr LGA and the Mbembe in Obubra LGA. Located towards the extreme northern area of the study zone, include many sub – group, which include: Etung group, Olulumo group, Ofutop group, Nkim/Nkum group, Abanajum group, Nseke and Boki groups situated in Ikom Local Government Area as well as in Etung and Boki Local

Government Area respectively. Interestingly, the Yala people, Ukelle people, Ekajuka

Figure 1: Geopolitical zones of Cross River State

people, Mbube people, Bette people, Bekwarra and Utugwanga peoples exist in Ogoja and Yala as well as in Obudu and Obanliku Local Government Area respectively. It is worthy of note that, in spite of the diversity of dialects in Cross River State, the various groups possess the same characteristics root, categorized as Bantu.
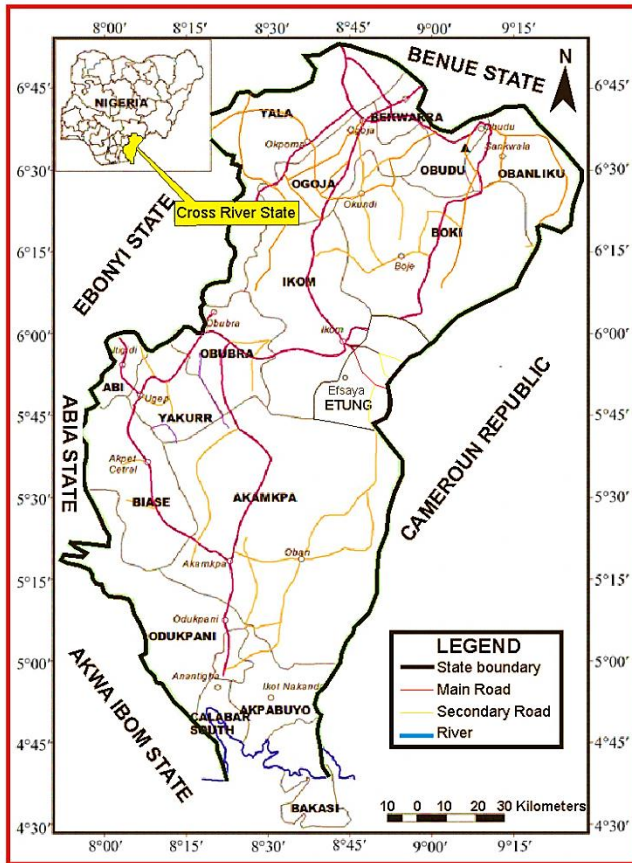
B. Festivals in Cross River State

Many festive activities exist in Cross River State. These festive activities promote tourism, which generate revenue to Cross River State. Notable among these festive activities are: the Cross River State Christmas festival, an event with lovable fun and carnival and with games and display of culture as well aspageant, art and music exhibition. It takes place annually from 1st day of December to 31st day of December; the Cross River State Carnival float which also takes place in December from the 26th through 27th every year and the Yakurr Leboku Yam festival, which is observed on the 28th day of August. Other interesting festivals in the state is a festival, known as Bahumono, an event exhibiting in Anong, where exciting cultural play are showcase.

C. Tourism attractions in Cross River State

Cross River State is a tourism state. The state prides itself as the leading tourism state in Nigeria and in West Africa, where visitors troop in large numbers all year round. Notable among the tourist attractions in the state is shown in table 3 below.

Table 2: Some Tourism attractions in Cross River State

| Attractions	Location	Attractions	Location
Obudu Dam	Obudu	Drill Ranch Buanchor Boki	Boki
Bebi Air strip	Obanliku	Canopy Walkway Buanchor	Boki
Water park	Obanliku	Monoliths	Ikom
Daily Farm	Obanliku	Salt Pond	Yala
Cable car	Obanliku	Refome Lake	Abi
Presidential Lodge	Obanliku	Agbokim Waterfall	Etung
Conference Centre	Obanliku	Kwa falls	Akamkpa
Becheve Canopy Walkway	Obanliku	Tinapa	Odukpani
Gymnasium	Obanliku	Calabar International Con. Centre	Odukpani
Obudu Mt Reception	Obanliku	Marine retort	Cal. Municipality
De Grotto	Obanliku	Cercopan	Cal. Municipality
Honey Factory	Obanliku	Calabar Botanical Garden	Cal. Municipality
Holy Mountain	Obanliku	Mary Slessor's Residence	Odukpani
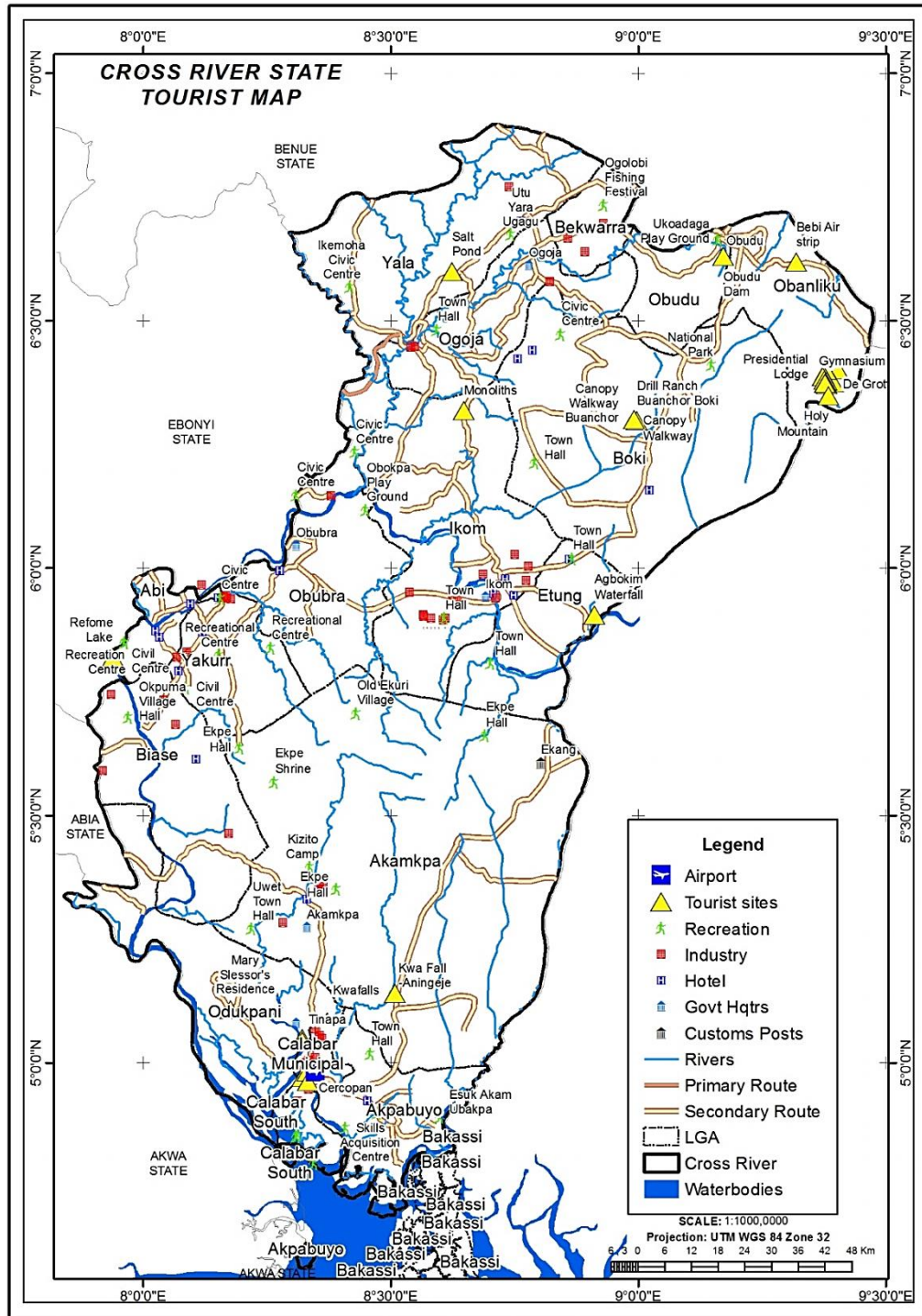
Figure 2: Map of Cross River State showing the major Tourism areas

VII. Materials and Methods

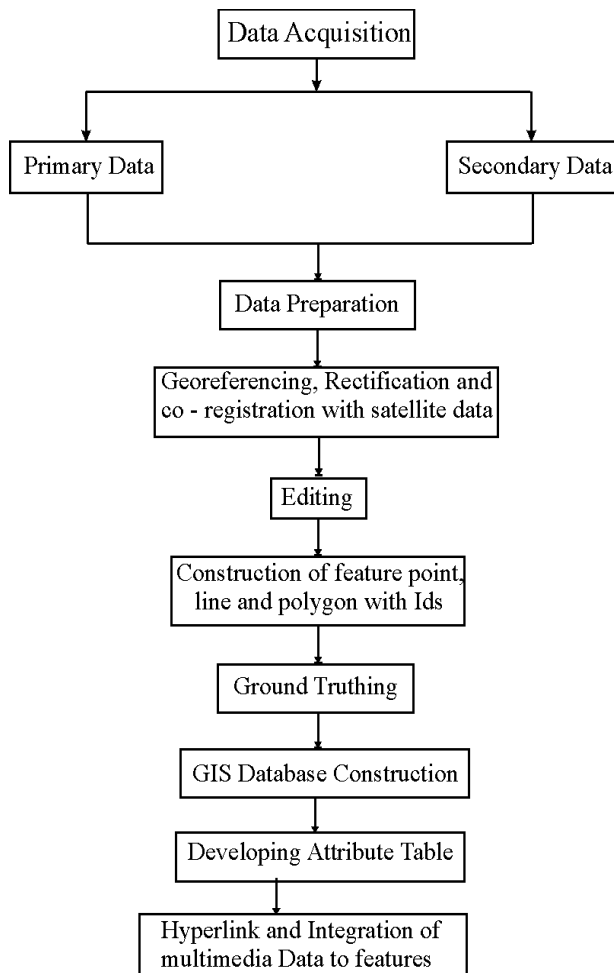The methodology flow chart for the study is shown in figure 3 below.

Figure 3: Methodology flow chart for the study

A. Sources of data acquisition
To acquire data for the study, two sources of data are utilized. These are primary and secondary sources of data.

The Primary data: The primary sources of data include the location base map, satellite imageries, location video, questionnaire and the co – ordinates of the attraction points obtained through ground trothing by using the Global Positioning System (GPS).

The Secondary data: The secondary data for the study were obtained from journals and other available literature.

B. Procedure for the development of the GIS database
Mapping of tourist attraction centres in Cross River State was carried out by integrating different datasets (i.e. integrating existing maps and digital photographs of Cross River State and the Google earth map) in the ArcGis 10.5 software. The analogue map was converted to digital format with the aid of the scanner. The global positioning system was utilized, so as to acquire the coordinates to geo–reference and updating existing map. Digitization carried out was utilized in converting raster into vector data with the aid of the ArcMap 10.5 software

VIII. Analysis of Results
In this study, queries on a GIS database was carried out, so as to retrieve data. Queries present a data retrieval which can be performed on data that are part of the GIS database. Different types of queries were presented in this study, as a result of link between the geographic data and the attribute data utilized in the implementing software for the study. Questionnaire were also distribution, so as to access the people's view on how tourism has influence socio – economic, environmental, service products and infrastructures of the people.

A. Single Criteria Queries
In this study, a single condition is used to query on the database. In single criterion queries, spatial search operations are utilized to demonstrate single criterion analysis. It answers questions such as: what is and where is it? Thus, the variants of queries involved here are queries by attribute and by location.

B. Query by attribute: Query by attribute is utilized in retrieving geographical record from the information system by defining a certain criteria. This query is implemented by building a SQL expression in the attribute dialogue box of an arc – map label.
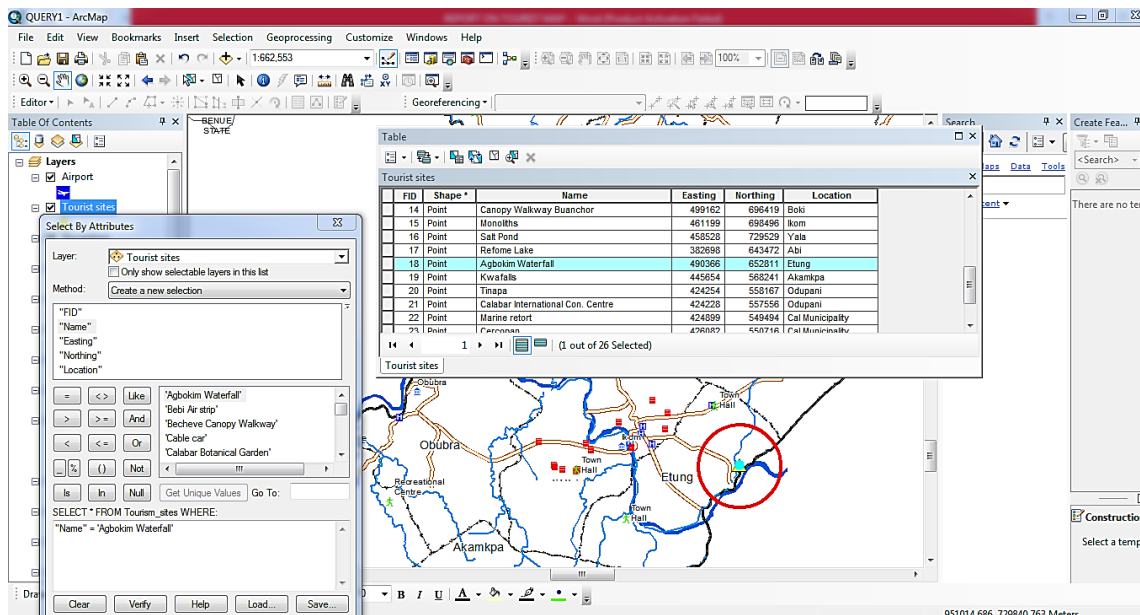
Figure 4: Query by attribute with syntax "name"=" Agbokim Waterfall"

Figure 4 shows the query by attribute obtained from the database, to highlight the location of Agbokin waterfall, situated in Etung, a Local Government Area within the study area.
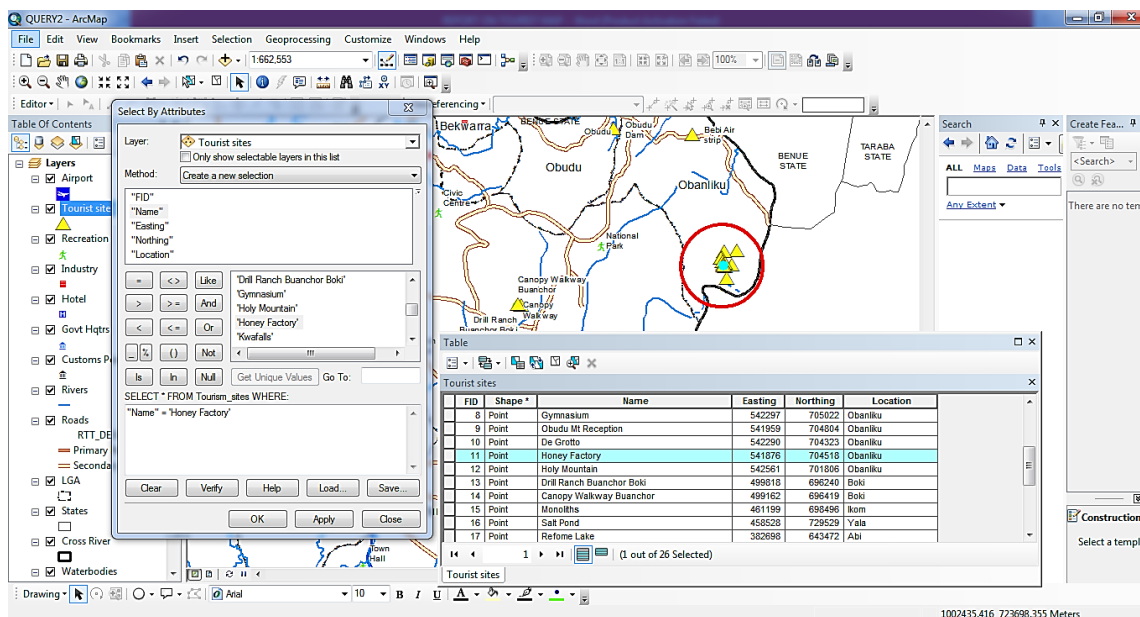

Figure 5: Query by attribute with syntax "name"=" Honey Factory"

Figure 5 also show query by attribute obtained from the database, to highlight the location of Honey factory, which is found in Obanliku, a Local Government Area situated within the study area.

C. Query by Location: Query by location is utilized in retrieving geographical record from the information system by defining a certain criteria. This query is implemented by building an SQL expression in the attribute dialogue box of an arc – map label.
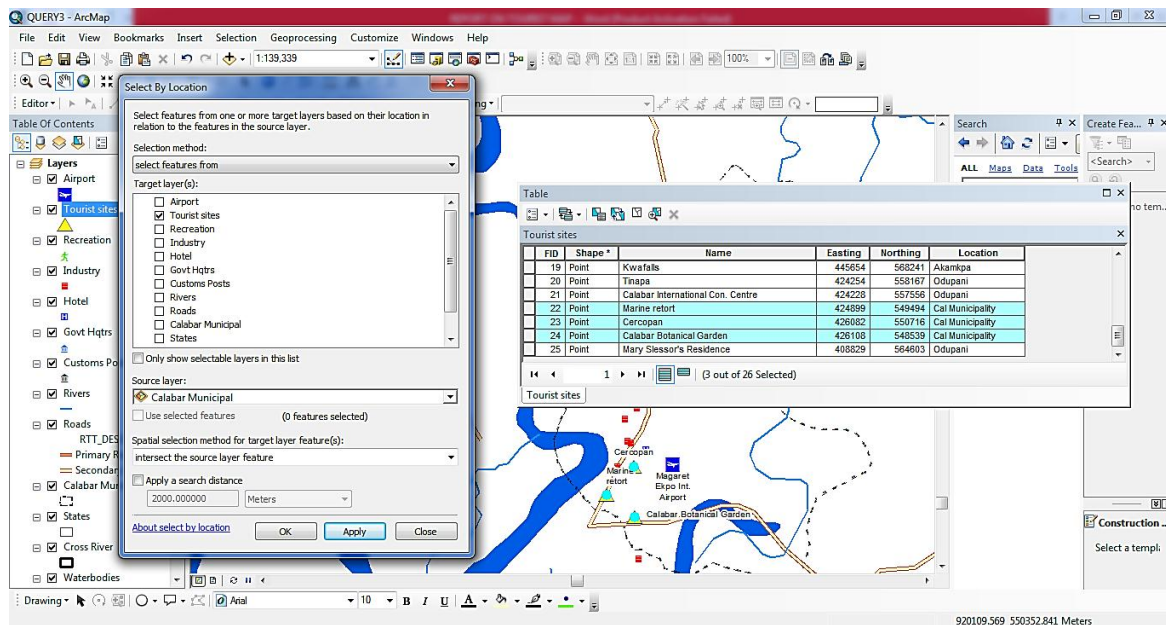
Figure 6: Query for tour sites with with syntax "calabar municipal"= "tourist sites"

D. Multiple Criteria Queries

Here, more than one conditions are utilized to query the database. For Example, Query for four sites with object ID equal to 2 or less than or equal to 14. In multiple criteria query, tabulate queries is permitted.
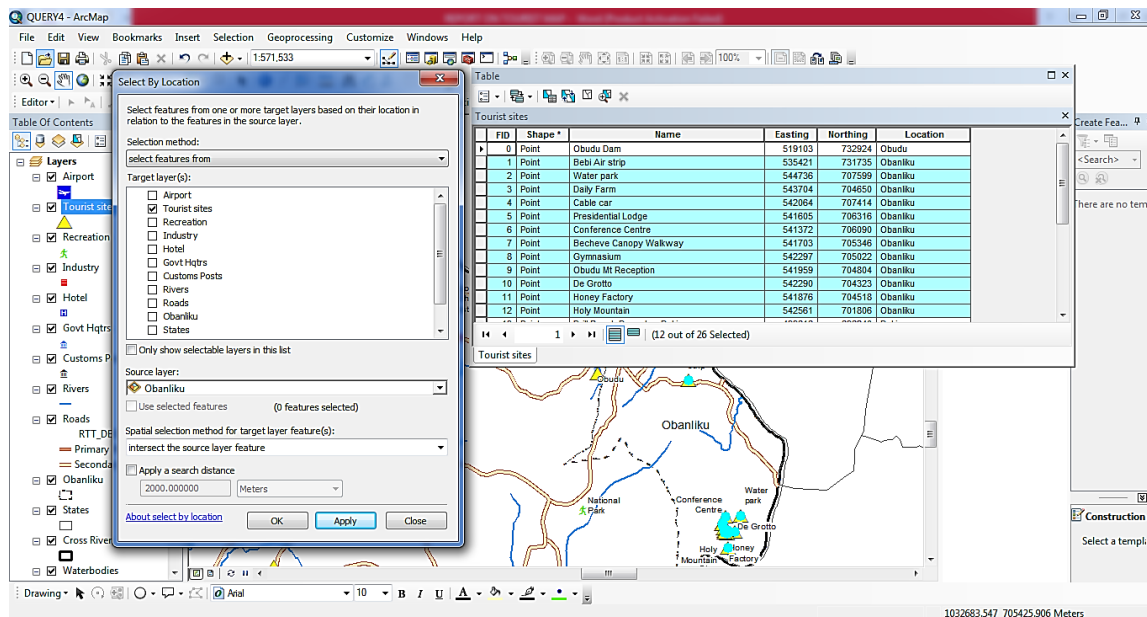

Figure 7: Query for tour sites with with syntax "Obanliku"= "tourist sites"

Figure 7 is an example of multiple criteria query, which shows attribute table and locations of various tourist attractions in Obanliku, a Local Government situated within the study area.

E. Multimedia Queries

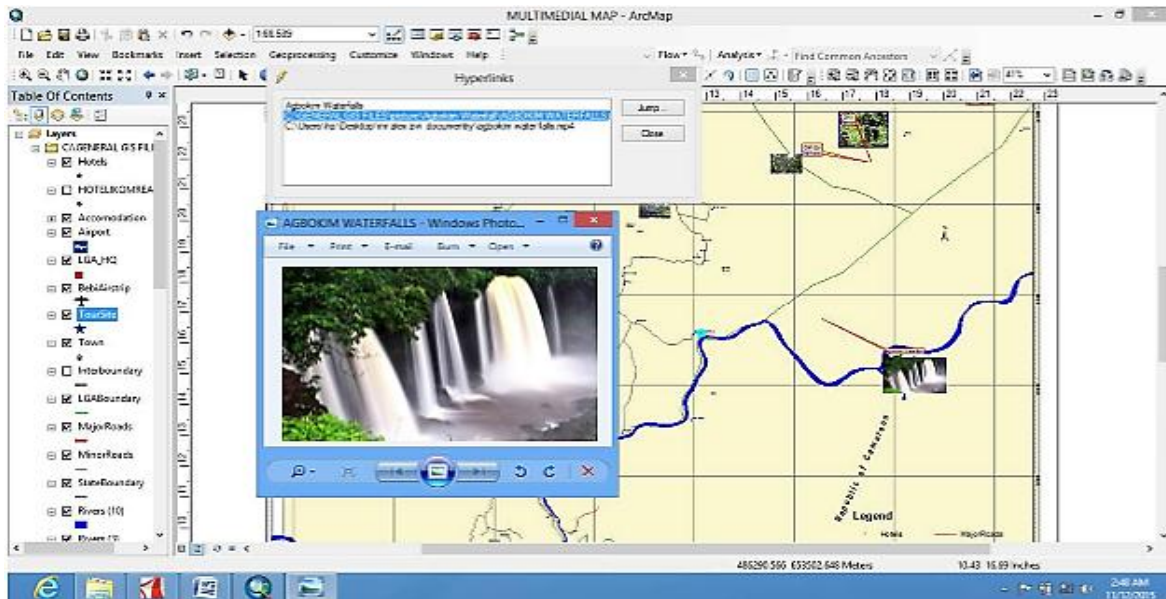Query can also be multimedia. This is shown in figure 8 below.

Figure 8: Multimedia Query showing video of Agbokin waterfall in Etoung L.G.A. of Cross River State

Figure 8 shows a multimedia query of Agbokim waterfall in the present Etoung Local Government Area of Cross River State, Nigeria. The waterfall is enclosed in a lush tropical rainforest and is estimated to be about 30 – 40 metres high.   The waterfall consists of conglomeration of seven streams, which eventually form the waterfall – the Agbokim River. The valley of the waterfall have small pieces of mother rocks (rock aggregates, which often falls from the cliff which is immediately beneath the hard surface rock).

IX. Socio – Economic and Environmental Influence of Tourism in Cross River State

A.   Do the following Social Problems in table 3 influence Tourism in Cross River State

Table 3: Social Problems which influence Tourism in Cross River State

Questionnaire	SA	A	D	SD	CS	Percentage (%)				
						SA	A	D	SD	CS
Way of life and activities of the people	9	13	7	0	1	30	43.3	23.3	0	3.3
Less practice of cultures and norms	11	5	10	2	2	36.7	16.7	33.3	6.7	6.7
Exploration and exploitation of resources, women as well as the local people	8	8	11	2	1	26.7	26.7	36.7	6.7	3.3
High pressure on amenities and Land-use	4	13	9	3	1	13.3	43.3	30	10	3.3
Differ conflicts associated with users of the resources	5	10	6	3	6	16.7	33.3	20	10	20
Over stretch of available amenities	5	9	12	3	1	16.7	30	40	10	3.3
Conflict of cultural practices	3	12	11	2	2	10	40	36.7	6.7	6.7
Discretion of local zone designated as sacred.	4	11	9	2	4	13.3	36.7	30	6.7	13.3

SA = Strongly Agree; SA = Strongly Agree; A = Agree; D = Disagree; DA = Strongly Disagree; CS = Can't Say

From table 3, we see that only a few percentage of people are on the neutral side that social problems pose a threat to tourism in Cross River State while majority of the people agree and also disagree to the fact that social problems influences tourism in Cross River State

B.   Do the following Social activities in table 4 influence Tourism in Cross River State?

Table 4: Social activities which influence Tourism in Cross River State

Questionnaire	SA	A	D	SD	CS	Percentage (%)				
						SA	A	D	SD	CS
Availability of Telecommunication	18	10	2	0	0	60	33.3	6.7	0	0
Siting of suitable roads	18	10	2	0	0	60	33.3	6.7	0	0
Siting of honeypots	11	17	2	0	0	36.7	56.7	6.7	0	0
Availability of service care, such as transportation, schools, health care.	17	11	0	1	1	56.7	36.7	0	3.3	3.3

SA = Strongly Agree; SA = Strongly Agree; A = Agree; D = Disagree; DA = Strongly Disagree; CS = Can't Say

Visualizing table 4, we note that a high percentage of the people agree to the fact that the above social activities, influence Tourism in Cross River State, thus tourism is then to be promoted in Cross River State with the availability of social activities.

C. Do the following factors in table 5 influence Tourism in Cross River State?

Table 5: Factors which influence Tourism in Cross River State

Questionnaire	SA	A	D	SD	CS	Percentage (%)				
						SA	A	D	SD	CS
Suitable climatic condition	10	13	3	0	3	33.3	43.3	10	3.3	10
Availability of water bodies such as rivers, ponds, lakes etc.	20	9	1	0	0	66.7	20	3.3	0	0
Availability of natural and artificial features (such as mountains, hills, national parks, waterfalls etc.)	21	8	1	0	0	70	26.7	3.3	0	0
Availability of facilities for use	9	18	3	0	0	30	60	10	0	0
Peaceful and friendly lifestyle of the local people	7	10	2	0	1	56.7	33.3	6.7	0	3.3

SA = Strongly Agree; SA = Strongly Agree; A = Agree; D = Disagree; DA = Strongly Disagree; CS = Can't Say

From table 5, we observed from the questionnaire that majority of the people agree that they above factors influence tourism in Cross River State while few people disagree and almost no one is on the neutral option.

D. Do the following factors in table 6 have positive environmental influence on Tourism in Cross River State?

Table 6: Factors with positive environmental influence on Tourism in Cross River State

Questionnaire	SA	A	D	SD	CS	Percentage (%)				
						SA	A	D	SD	CS
Conserved landscapes to sustain ecosystem	16	14	0	0	0	53.3	46.7	0	0	0
Preserved wildlife species	15	11	3	0	1	50	36.7	10	0	3.3
Preservation of historic dwelling places and existing gardens	13	15	1	0	1	43.3	50	3.3	0	3.3
Development of National Park and existing theme park	14	12	2	0	2	46.7	40	6.7	0	6.7
Observed distance footpath associated with geographical studies	7	13	5	2	3	23.3	43.3	16.7	6.7	10
Formation of lakes and associate holiday resort.	12	14	1	0	3	40	46.7	3.3	0	10

SA = Strongly Agree; SA = Strongly Agree; A = Agree; D = Disagree; DA = Strongly Disagree; CS = Can't Say

E. Do the following factors in table 6 have positive environmental influence on Tourism in Cross River State?

Observing table 6, we see that majority of the people agree that they above factors in table 6 have positive environmental influence on tourism in Cross River State while few people do not agree and also are on the neutral option.

F. Do the following Services in table 3 influence Tourism in Cross River State?

Table 7: Suitable Services which aid Tourism in Cross River State

Services	No. of Respondents		Percentages (%)	
	Yes	No	Yes	No
Suitable meeting halls and conference centre	27	3	90	10
Suitable air, water and road transport zones	24	6	80	20
No traffic congestion	14	16	46.7	53.3
Presence of world class	30	0	100	0
Leisure and organized programs	29	1	96.7	3.3
Availability of small and medium scale shops	23	7	76.6	23.3

From table 7, it is observed that majority of the respondent admit that suitable services aid Tourism in Cross River State while few respondent do not admit to that effect.

X. Conclusion and Recommendation

Tourism is one of the most important industries in the world today. It involves migration of tourists, from their home town, so as to reside in another place, for a given time period of twenty four hours, but not more than one calendar year, and with which such migration must be for business, leisure and for other interesting events, and not for employment. Cross River State is one of the states in the south – south geopolitical zones of Nigeria, blessed with numerous tourist attractions yawning for development. GIS is an information system which may be utilized to improve tourism and for mapping tourist centres. With GIS, location, distances, road networks, hotels and the various attractive areas can be determined. The study shows that if a tourist is provided with detailed and adequate information, which is provided in the tourism database, the information might increase the tourists' appeal about the area visited. Sequel to the study, GIS's application in tourism is recommended, owing to its quick as well as effective way to identify suitable tourist centres and with details associated with it.

References

[1] Ayeni O. O. (2006): "*A multimedia GIS Database for planning management and promotion of sustainable Tourism industry in Nigeria"*. FIG Congress, Munich, Germany, PP 8 – 13

[2] Wheatley D. and Gillings M. (2002): *"Spatial Technology and Archaeology. The Archaeology application of GIS*", London, New York: Taylor and Francis

[3] Bahaire T. and Elliott W. M. (1999): "*The application of Geographic Information System (GIS) in sustainable tourism planning: A review*". International Journal of Sustainable Tourism, 7 (2), PP 159 – 174.

[4] Bankole A. (2002): *"Nigeria Tourism Sector: Economic Contribution, Constraints and Opportunities: Journal of Hospitality financial management*", Volume 10 (1) pp 70 – 89.

[5] Baviskar (2017): "*Designing and developing a GIS Database for Tourism in Aurangabad: A Review*": International Journal of Computer   Application (0975 – 8887); volume 165

[6] Cook Roy, Yale Laura and Marqua Joseph (2006): "*Tourism,the business of travel; New Jersey: Pearson Education Inc*".

[7] Dyer P., Gursoy D., Sharma B. and Carter J. (2007): "*Structural modeling of resident perceptions of tourism and associated development on the sunshine coast, Australia*" Tourism management, Volume 28, No 2, pp 409 – 422.

[8] Ezenagu N. (2013): "*Tourism a Viable path for wealth Creation in Nigeria: An Analysis of Awka Metropolis*": International Journal of Science and Research, Volume 2 (9) pp 2319 – 7064

[9] Fadahunsi J. T. (2010): "*Application of Geographic Information System (GIS) Technology to tourism management in Ile – Ife, Osun State, Nigeria*". The pacific Journal of Science and Technology, PP 274 – 283

[10] Fajuyigbe O., Balogun V. F. and Obembe O. M. (2007): "*Web – Based Geographic Information System (GIS) for Tourism in Oyo State, Nigeria.*" Information Technology Journal

[11] Fellman J. D., Bjelland M. D., Getis A. and Getis J. (2008): "*Human Geography: Landscapes of human activities*". New York: McGraw – Hill

[12] Feick R. D. and Hall B. (2000): "*The application of a spatial decision support system to tourism based land management in small island states:*" Journal of travel research, 39, PP 163 – 171.

[13] Glasson J., Godfrey K. and Goodey B. (1995): "*Towards Visitor Impact management: Visitor Impacts Carrying Capacity and management responses in Europe's Historic Towns and Cities England:"* pp 189

[14] Jovanovic V. and Njegus A. (2008): "*The application of GIS and its components in tourism. Journal of operation research*". Vol. 18 (2): 261 – 272.

[15] Nigeria Tourism Master Plan (2006): "*Institutional capacity strengthening to the tourism sector in Nigeria. NIR/03/002*"

[16] Obeta C. E. and Onah J. O. (2013): "*Assessing Tourism Potentials for Rebranding Nigeria:*" Journal of Business and management. Volume 8 (6) pp 30 – 36.

[17] Okonkwo E. E. and Odum C. J. (2010): "*Tourism an alternative for economic independence and rural develolment in Nigeria (ed) Nekang F. M Africa Journal of Pure and Applied Science*", Vol. 5, No 3.

[18] Okpo P. U., Okonkwo E. E. and Dimiyi C. (2008): "*Understanding Tourism, Nsukka: University of Nigeria press Ltd*".

[19] Oladipo E. (2010): "*Towards enhancing the adaptive capacity of Nigeria. A review of Nigeria sate of preparedness for climate change*". A report submitted to Heinrich Boll foundation.

[20] Omitogun A. A. and Oyinloye R. O. (2008): "*Remote Sensing and GIS for Tourism Development: An Experience with Osogbo Grove, Osun State, Nigeria*".

[21] Pick J. P. (2005): "*Geographic Information System in Business. IPG, Hemphrey*"

[22] Seker D. Z., Kabdasli S., Duran E., Mercan D. E. and Elginoz N. (2002): "*Analyzing and management of tourism activites by menas of GIS technique*". International Symposium on GIS, PP 23 – 26.

[23] Shah S. and Wani M. (2015): "*Application of geospatial technology for the promotion of tourism industry in Srinagar city*". International Journal of u – and – e service, science and technology, Vol. 8, No 1.

[24] Thecia I. and Odum C. (2014): " *Designing and developing a GIS Database for Tourism in Nigeria: The case of Anambra State, Akukwe: IOSR*" Journal of Humanities and Social science (IOSR – JHSS) Volume 19, Issue 10, PP 109 – 120.

[25] Tunde A. M. (2012): "*Harnessing Tourism Potentials for Sustainable development: A case of Owu water falls in Nigeria:*" Journal of Sustainable Development in Africa: Volume 14; pp 119 – 133.

[26] Turner R. and Sears Z. (2014): "*Travel and Tourism as a Driver of Employment Growth: in the Travel and Tourism Competitiveness Report 2103*" World Economic Forum 2014.

[27] World Tourism Organization (1995): "*UNTO Technical manual; collection of Tourism Expenditure statistics*"