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Comparative Analysis of Water Samples of Selected Beaches in Lagos State, Nigeria and their Implication for Tourism Development

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ABSTRACT

This study investigated and analyzed the quality of water samples of selected beaches in Lagos state, Nigeria to ascertain their portability and their potential for tourism development. Water samples were collected from the three different spots of each beach studied and subjected to physical, chemical, organic and biological tests to ascertain the safety status of water and their acceptability for human consumption and other recreational activities. The results were compared with the World Health Organization (WHO) standards for compliance assessment. The result showed that the following parameters: pH, temperature, odor, conductivity, total dissolved solids, total dissolved solids, total hardness, acidity and alkalinity were within the WHO stipulated limit. Others include sodium, chloride, zinc, calcium, magnesium, lead, copper, manganese and chromium. Those above WHO recommended limits are the turbidity of Alpha beach, total suspended solids, arsenic, cyanide, phosphate and sulphate levels. The water sample contained heavy loads of coliforms and heavy metals which render the water unsafe for human consumption and recreational activities. This investigation recognizes the strategic importance of tourism towards economic development of the country. If beaches and other tourism resources are properly developed they can produce a distinctive tourism industry, capable of generating heavy and sustained tourism traffic. Based on the findings of the research, the researchers made recommendations that will be useful for maintenance, protection and conservation of the beaches in exploring the tourism potentials of beaches in Lagos State, Nigeria.

Keywords: Beach water, Heavy metals, Comparative analysis, Tourism development.

INTRODUCTION

Water is a natural chemical substance which comprises hydrogen (H) and oxygen (O)

H2O. It is polar, odourless, colourless, tasteless, amphoric, adhesive, elastic and exists in three physical states of matter namely solid, liquid and gas (Boundless, 2016). It is crucial for man's survival. Clean potable water is now enacted as a basic human right (Rahmanian *et al*., 2015).It is used for agriculture (irrigation), household application (drinking, cooking, bathing) recreation (swimming, boating, surfing, diving)   several other uses (Ndabula and Jidauna, 2010). Water is sourced through the surface (river, beach, sea, ocean, stream, lake, spring) and groundwater (well, boreholes). Despite its importance for existence, it is also a means of transmission of diseases and cause of death in developing nations as a result of the limitation in quality, accessibility and quality (Mbah and Mohammed, 2015).

Therefore, water quality control should be given priority in policy plan of every nation because every year about 6-8 million people die due to water-related diseases (Rahmanian *et al*., 2015). The usefulness of water for domestic, industrial application and agriculture depend on its physical, chemical and biological characteristics (Adhikary *et al*., 2010). Quality of water depends on its history and origin and water intended for drinking should be of safe condition, free from dangerous chemical substances and microbes (WHO, 2006). Water becomes infected with foreign materials such as pathogenic bacteria (Salmonella typhi, Shigalla dysentariao, Escherichia coli, Klebsiella pneumonia etc) viruses (hepatitis A, poliovirus), protozoan, parasites, chemical substances (fertilizer, pesticides, metals, inorganic chemicals, volatile organic compounds etc), radiological contaminants (uranium, cesium and plutonium), industrial liquid   wastes and other wastes, which degenerate its quality, making it unsafe for use (Muhammed and Mba, 2015, EPA, 2016, Okoro,2017). The increase in the rate of circulation of water-borne diseases across the world is on the increase, and cases of such conditions have been reported in Nigeria (Parissa *et al*., 2012 & Agwu *et al*., 2013).

The quality of water is determined by the extent to which it conforms to physically, chemically and biologically accepted standards set by international and national regulatory bodies, like the World Health Organization (WHO), Environmental Protection Authority (EPA), National

Standard for Safe Drinking Water Quality (NSDWQ), the National Agency for Food and Drug Administration and Control (NAFDAC) and a host of others (Oyebode, 2005). It is essential for every human being to have access to sufficient potable water and sanitary facilities (WHO, 2016).   Nigeria, Lagos State, in particular, is not left out in water and sanitation situation as it is still a stiff challenge to the nation. About 45,000 children under the age

of five die from diarrhoea diseases, caused by the nation's reduced level of access to good water and sanitation services (Water Aid, 2007).In her effort to tackle the problem, Nigeria signed up to the Sustainable Development Goals in 2015.Goal 6 talks about "clean water and sanitation" (UN, 2015). Water Aid Nigeria also launched its new five year country programme strategy (2016-2021), which aims at ensuring that everyone everywhere has access to clean water, sanitation and hygiene by 2030 (Water Aid, 2007). Several strategies have been designed to tackle the problem of access to improved drinking water.

Recreational water quality criteria are used to assess the safety of water to be used for swimming and other water-sport activities. The primary concern is to protect human health by preventing water pollution from faecal material or from contamination by inorganic, organic, radionuclides and microorganisms that could cause gastrointestinal illness, ear, eye or skin infections. Criteria are therefore usually set for indicators of heavy metals(trace elements) and faecal pollution, such as faecal coliforms, pathogens etc. There has been a considerable amount of research in recent years into the development of other indicators of microbiological pollution, including viruses that could affect swimmers and other partakers in other recreational activities. As a rule, recreational water quality criteria are established by government health agencies and organizations like the World Health Organization (WHO). Such measures are lacking and should be found in Nigeria and Lagos State in particular. Recreational use of water is often given inadequate consideration. This is of particular concern in those countries of the region where tourism is a vital source of foreign exchange and employment. It is also crucial to Nigeria that is at a developmental stage of tourism.

In general, recreation is a much-neglected area in terms of use of water within Lagos State and is hardly considered in the process of water management despite the available information from different researchers that suggest that pollution in recreational areas is a serious problem. This area is neglected in Lagos State and it of particular concern as the recreational use of water is very important in the study area. Therefore, there is need for constant purification and sterilization of natural sources of water like beaches to ensure that they are good for consumption and recreational activities. This is one of the gaps which this study filled. **Statement of the problem**

Nigeria is blessed with natural resources of enormous tourism potentials. Lagos State is enriched with a wild range of abundant cultural and tourism resources of which beach is one of them. These beaches are located in various parts of the State. The beach is one of the vacation spots for people that have an interest in eco-tourism. They can transform the State into tourist haven for domestic and international tourists. It gives the tourist special thrill and feeling of adventure while participating in sporting activities in beach and water bodies. Unfortunately, in this study area recreation is an overlooked area in terms of use of water. It is rarely considered in the process of water management despite the available information from different researchers and scholars that indicates that contamination of water in recreational areas is a serious problem because it destabilizes the ecosystem and causes gastro-intestinal illness, ear, and eye and skin infections. This is of concern because recreational use of water is very crucial in the study area. These are a severe threat to these beaches. People that live around these beaches, chemical industries and tourists that visit these beaches also have degraded the physical appearance of these beaches and beach environment with solid and liquid wastes, industrial wastes, littering and human excreta. All these have affected and reduced the quality of these beaches negatively for recreational activities.

Hence, it is against this backdrop that the researchers collected water samples from the selected beaches and subject them to laboratory tests, to determine the degree to which they fall in within the standard set by WHO and their implication for tourism development.

Objectives of the Study

This research is intended to investigate and analyzed the quality of water samples of selected beaches in Lagos state, Nigeria to ascertain their portability and their potential for tourism development. In specific terms, the research is targeted at:

1. To analyze the quality of water samples of selected beaches in Lagos State and ascertain their portability for drinking and recreational activities.

2. To determine their implications to tourism development in Lagos State.

Literature Review

Related literature to the subject under study, as well as to the key concepts of the topic and those that would derive from them, was reviewed under this section, especially for the purpose of conceptual explanations and clarifications. This will help form some opinion, as well as better digest the objectives of this study.

Tourism

The term tourism is hard to define in complete terms. Okpoko and Okpoko (2002) pointed out that definition of tourism has been an issue of long debate. It is extremely difficult to precisely define the concept "tourism" because it had different meaning to different people (Theobald, 2005). Scholars, authors and tourism experts have not been totally consistent in the usage of the concept, "Tourism". Burkart and Johnn (1981) defined tourism as the phenomenon arising from the short visit (or stay away from home) outside the regular place of residence for any reason other than furthering an occupation remunerated from within the site visited. Holloway (1989) defined tourism as a temporary short-term movement of people to destinations outside the place where they live and work, and activities during their stay at these destinations. It includes movement of all purposes, as well as a day visits and excursions. The United Nations World Tourism Organization (UNWTO, 1995) states that tourism comprises the activities of a person travelling to, and residing in areas outside their known environment for not more than one year for leisure, business, and other purposes.

Buttressing these definitions above, World Tourism Organization (WTO;2003) defined tourism as the movement of people to and stay in places outside their usual home for at least twenty-four hours and not more than one year for leisure, business and other reasons not related to any form of employment from within the place visited. This definition is mostly widely accepted in the world. Having gone this far in the definition of tourism, a common attribute of most of the definitions above is that tourism involves the temporary movement of people or group of people from one destination to another. This movement is voluntary, temporal and short- term. The visitor is expected to return home after a comparatively short time and the money they spend there is one derived from home not earned in the place visited. Such a movement must be aimed at achieving some desired objectives (Okpoko and Okpoko, 2002).

Beach

Gerhard and Hugles (2003) states that a beach is a wave-bain deposit of sand or gravel found along marine, lacustrine and estuarine shorelines. Encyclopedia Americana (2004) defined a beach as a deposit of sediment, along lake or ocean shoreline that forms a boundary between the water and the land. Anunobi (2014) see the beach as a geological formation consisting of loose rock particles which includes sand, shingle or cobble alongside the shoreline of a body of water. Bascom (1980) concurred that a beach is the entire system of sand set in motion by waves of a depth of ten meters (30 feet) or more of ocean coast by force. It offers a pleasing aesthetic environment and forms a significant relaxation and recreational resource.

Beach Tourism

Beach tourism is tourism around beach areas. It is a kind of tourism that takes place at sea sides or coastal zones. Beaches are popular destinations that have a strong attraction for tourists.

Tourism development

Presently, developing countries view tourism as a means of helping their effort to grow economically. Historically, tourism is a development sector which is dynamic for local and international activities in developing countries. Tourism offers growth prospects which most of the export did not provide. One of its benefits over other forms of export is that it is not encountered with thrift or quota barriers. Presently many countries try to restrict travel preference of their citizen and their exports of currency to go with. This is a remarkable characteristic which distinctly makes it comparative to other exports a captivating preference for many developing countries. The developed nations of the world are mainly generating countries for tourist and in turn, the developed country has hard currency and earning this currency is vital to establish developing countries because it is needed for support of their development effort.

In recent years, many tourism nations have assessed the socio-economic and environmental impacts of tourism with encouraging results. On how tourism impacts positively on the economy of a country locally, tourism experts believe that it brings a large number of tourists from outside to inside. These tourists spend their money on accommodation, shopping, food, drinks and transportation. The spending provides an economic boost to local enterprise in the country locally. The injection of income resulting from visitor expenditures has the potential to create jobs and revenue, alleviate poverty, and indirectly led to the development of other sectors of the country's economy (Daldy, 2003 in Esu, 2007). Revenue received by the government from the tourism sector may be direct or indirect. Direct revenue comes from charging taxes on income. Indirect sources comprise the range of taxes and duties levied on goods and services supplied to the tourist (Leonard, 1997). Advocates of tourism say that tourism is an industry with considerable growth potential. They talk about its economic and social benefits.

Water

Water is a natural chemical substance which comprises hydrogen (H) and oxygen (O)

H_2O. It is polar, odourless, colourless, tasteless, amphoric, adhesive, elastic and exists in three physical states of matter namely: solid, liquid and gas (Boundless, 2016). It is crucial for man's survival.

Method of Research

In order to properly execute this research, the researcher used a descriptive survey design, and beach water samples was subjected to laboratory test. Primary data was collected from the communities where the beaches are located. Secondary data was collected from the internet, relevant published and unpublished sources including journals, textbooks, magazines, newspapers, government reports and other reports were consulted. An in-depth interviews with the aid of interview guide was conducted in towns and local government areas where the beaches are located. Questionnaires were also distributed to the respondents, namely indigenes of the study domains, tourists, visitors, tourism professionals and government officials, staff of Ministry of Tourism and waterfront, local government tourism committees and Nigeria Tourism Development Corporation (NTDC). A reconnaissance survey and field observation with the aid of checklist was undertaken by the researchers to observe the beaches and do an on the spot assessment of the physical environment of the beaches, actions and behavior of tourists and beach workers and other events that take place in these sites.

Sample Materials, collection and pre-treatment

Water samples were collected from the beaches with a 100 cl plastic container that was washed with diluted Hydrogen Chloride (HCL) (0.05ml) as the pre-treatment process, after which distilled water was used in rinsing the containers. They were air dried in a dust-free environment. Samples were collected from three different spots of each beach and corked tightly. These samples were stored in a refrigerator at 4°C prior to laboratory analysis and carefully transported to the Department of Biochemistry of the University of Nigeria, Nsukka for physicochemical and microbial analysis. Analyses were carried out in triplicates, and the average values were calculated. These water samples were subjected to laboratory test to ascertain the safety status of

water and their suitability for human consumption and other recreational activities. Water samples were subjected to physical, chemical, organic and biological tests. The parameters tested are shown in table 1. The results were compared with the World Health Organization (WHO) standards.

Equipment, instrument for laboratory test and sample analysis

These included the Atomic Absorption Spectrometer (Model AA-700 Shimadzu, Japan), pH meter (Model 3510 Jenway UK). Spectrophotometer (UV-1800 Shimadzu, Japan), electronic balance, pipettes, filter paper, conical flask, desicator, beakers, sterile Petri dishes and turbidity meter, weighing balance, the crucible, fume cupboard, funnel, filter paper and 100 litre standard flask.

Beach water samples were subjected to Atomic Absorption Spectrometer (Model AA-700 Shimadzu, Japan), to ascertain heavy metals in the study area. The instrument setting and operational conditions were done in accordance with the manufacturer's specification.

BACKGROUND INFORMATION OF THE STUDY AREA

Lagos State is situated in the south-western part of Nigeria on the constricted coastal flood plains of Bight of Benin. It is situated more or less on longitude 20 45E and 40 20E east respectively and sandwiched between latitude 60 2 N and 60 2 N and occupies 5 square kilometres. It is bordered between the north and east by Ogun State of Nigeria and in the West by the Republic of Benin and stretches over180 kilometres along the Guinea Coast of the Bight of Benin on the Atlantic Ocean. It is the least state in the federation and consists of lagoons, coastline and creeks of more than 225kilometers stretching from Epe in the East to Cotonou in the Republic of Benin. Besides, it covers a territorial area of 358,862 hectares or 3,577 sq km, which represents 0.4% of

Nigeria's total landmass of 923,773 square kilometres (Lagos State Diary, 2014).

Lagos State with its tropical wet and dry climate borders on a tropical Monsoon climate. It has two climatic seasons: wet season and the dry season in Lagos State just like other parts of Nigeria, and it experiences a tropical savannah climate. It has two climatic seasons: the dry (November to March) and wet season (April till October). Wettest period takes place in the June with precipitation total 315.5millimetres (12.42 in) while the driest month is January with precipitation total 13.2millimetres (0.52 in). The state also experiences a relatively short dryness in August and September and a longer dry season from December to March. Furthermore, the monthly rainfall averages over 400 mm (15.7in) between May and July and goes down to 200 mm (7.9in) in August and September and then in December, it goes down as low as 25 mm (1.0in). The dry season comes with the harmattan winds from the Sahara desert, which can be quite strong between December and early February. The highest maximum temperature ever recorded in Lagos State was 37.30°C and the minimum 13.90°C (Lagos State Diary, 201 4). Due to the fact that the city is located near the equator, the temperature is always constant with no significant difference between the hottest month and the coldest month. The month of March which is the hottest period has an average temperature of 28.5°C (83.3°F), while the coldest month is August and has an average temperature of 25.0 °C (77.0°F).

As a result of favourable climatic conditions, agriculture flourishes in the State, making it possible to have two harvests in waterways, which constitutes about 787 square kilometres of the State territory. The Lagos and Lekki Lagoons are the major water bodies located in, Yewa, Ogun together with Oshun and Kweme rivers. In addition to this, we have Ologe Lagoon, Kuramo waters, Badagry, Five Cowries and Omu creeks. Swamp forest, both of which are influenced by the double rain forest pattern of the state made the environment a wet area. It has varieties of trees.

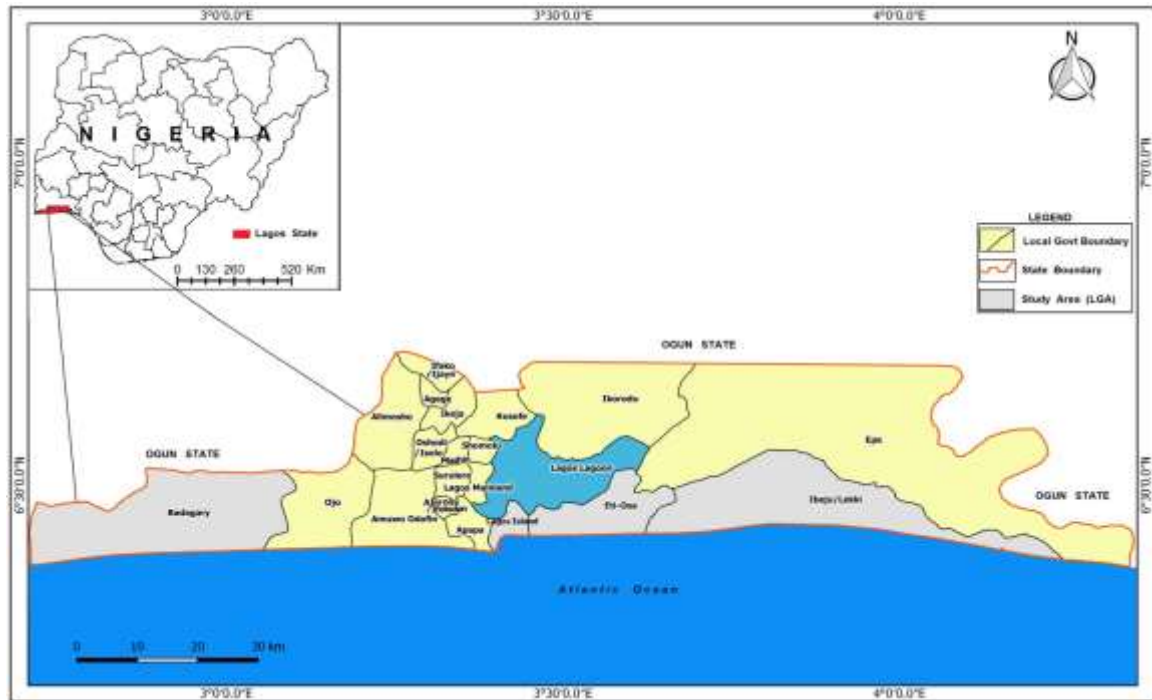There are 36 beaches in the state only four were selected for this study.

Fig 1: Lagos State Showing the Study Area (Local Government Areas studied are coloured in grey) Source: GIS/Digital Cartography Laboratory, Dept of Geography, UNN

RESULTS AND DISCUSSIONS

The table below presents the result of physic-chemical analysis of selected batch water samples. It shows the mean values of the parameter tasted in comparison with WHO (2011) recommended limit. The findings and implications are thus discussed subsequently.

Table 1. Table of Comparative analysis of Physico-chemical result of beach water samples from selected beaches with World Health Organisation (WHO) drinking Water standard

Parameter	Bar Beach	Alpha Beach	Gberefu	Suntan	Who Limit
Physical Test					
pH	7.83±0.06	6.27±0.06	8.13±0.06	7.93±0.06	6.5-8.5
Temperature oC	30.00±0.00	30.00±0.00	30.00±0.00	30.00±0.00	_
Conductivity	443.33±5.77	471.67±2.89	468.33±2.89	481.67±2.89	1000
Total suspended solids	49.93±0.95	67.23±1.75	71.33±2.48	73.00±2.11	25
Odour	Indistinguishable	Indistinguishable	Indistinguishable	Indistinguishable	Odourless
Total Hardness	191.70±3.22	223.30±8.02	205.30±6.43	277.00±10.15	500
Total dissolved solids	5340.33±208.77	4594.00±202.67	5941.00±86.64	4612.00±141.10	1000
Chemical Test					
Total acidity	168.33±3.51	15.80±0.35	-	-	600
Total alkalinity	0.21±0.01	4.97±0.21	178.00±4.36	164.00±5.29	500

Arsenic	0.21±0.01	0.26±0.06	0.34±0.03	0.51±0.03	0.01
Zinc	0.14±0.01	0.13±0.00	0.13±0.00	0.14±0.01	3.0
Iron	0.02±0.03	0.04±0.04	0.02±0.03	0.04±0.05	0.3
Calcium	45.88±4.82	47.11±5.17	44.25±3.83	44.93±3.01	50
Magnesium	70.22±1.05	67.09±1.20	67.04±1.02	61.27±0.81	150
Lead	`0.00±0.00	`0.00±0.00	0.00±0.00	0.00±0.00	0.01
Copper	0.12±0.01	0.12±0.01	0.13±0.01	0.14±0.00	1.0
Nickel	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00	-
Manganese	0.01±0.00	0.02±0.00	0.01±0.00	0.01±0.00	0.08
Chromium	0.00±0.00	0.01±0.00	0.01±0.00	0.01±0.00	0.05
Nitrate	23.88±1.31	29.48±1.36	32.84±0.31	30.90±0.59	-
Chloride	146.62±3.56	153.53±2.83	170.60±1.50	185.39±2.80	250
Sulphate	150.43±3.90	156.11±1.89	173.62±2.46	164.96±1.78	150
Phosphate	5.93±0.31	5.47±0.21	5.13±0.21	0.01±0.00	5
Cyanide	0.00±0.00	0.00±0.00	0.01±0.00	0.00±0.00	-
Mercury	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.006
Sodium	14.31±0.70	16.33±0.41	19.36±0.73	19.55±0.38	20

Organic Test					
Biochemical Oxygen Demand	1.42±0.04	7.03±0.32	1.14±0.07	0.81±0.04	6.0
Chemical Oxygen Demand	8.94±0.19	11.64±0.74	6.51±0.33	0.86±0.06	0
Dissolved Oxygen	4.73±0.19	18.51±1.06	4.44±0.30	4.65±0.13	5
Oil and Grease	0.05±0.01	0.03±0.00	0.04±0.00	0.09±0.00	0
Biological Test					
Total Plate Count	58.00±2.00	81.33±4.16	40.33±2.08	38.00±3.00	0
Total Coliforms	34.00±1.53	47.67±1.53	28.00±2.00	24.33±1.15	0

Generally, the pH of beach samples are within WHO stipulated limit of 6.5 - 8.5, except that of Alpha beach (6.5), which is slightly below the threshold. The values of pH from 0-7 represent increasing acidity, 7-14 increasingly alkalinity and 7 neutral (CPCB, 2011). The water samples derived from the sites were alkaline water, which is good for health because it helps in calcium retention and bone health. The alkaline trend was also reported in a similar study carried out at Bonny, Opobo and Port Harcourt in Rivers State (Obinwanne,2016).Tests have shown that alkaline water has beneficial effects on some health issues (H2O for Health, 2012). This implies that the more alkaline the water is the better the benefits for human health. Drinking water with high pH value above 11 can lead to skin, eye and mucous membrane irritation, while Ph below 4 also causes irritation due to corrosive effect (Rogers, 2013.) The mean temperature of the four water samples was 30 OC, which is good and acceptable for drinking water. They were odourless, but turbid.

Although turbidity is not a threat to health, it can have a negative implication on people's acceptability. As a result of visible cloudiness (WHO, 2011 and Okro,2017).

 The conductivity of water from all beaches was within the accepted limit. A high value of total suspended solids may be unacceptable for recreational purposes such as bathing and swimming. Total hardness of all the samples were below WHO permissible limit. Total hardness of water is sum of calcium and magnesium ion concentrations. The hardness of water is caused by high mineral content and presence of soluble metals. It is an essential property of

water and is very useful for life processes. Studies by scholars showed that hard water has no known impact on health, but due to the presence of calcium, it is helpful for the growth of children and could serve as an essential supplement to total calcium and magnesium intake (Galan *et al.*, 2002). High intake of hard water may also have a laxative effect (change in bowel habits) on visitors and tourist that consume beach water. The alkalinity levels of all beaches were entirely below the WHO standard.

This showed that the neutralizing capacity of the water sample is low.

The result also revealed that the water samples contained solids, which are filterable and nonfilterable matters that remained as a residue after evaporation and subsequently at a defined temperature. They are classified into total dissolved solids and total suspended solids. The mean Total suspended solids (TSS) (mg/l) value for Bar beach was 49.9 mg/l, Alpha is 67.2 mg/l, Gberefu was 71.3 mg/l, and Suntan is 73 mg/l which are above WHO limited of 25mg\l. Their high values may be aesthetically unsatisfactory for purposes such as bathing, diving, swimming, underwater football and other water sports activities. The mean Total dissolved solids (TDS) (mg/I) value of Bar Beach is (5340 mg/l), Alpha (4594 mg/l), Gberefu (5941 mg/l) and Suntan was (4612 mg/l), while WHO limit is 1000mg/1. These values are very high and above the WHO stipulated limit of 1000mg/1. This may be due to the inferior palatability and unfavourable physiological reactions in their use for recreational activities. The mean turbidity of Bar Beach is 10.6 NTU, Alpha beach 11.305 NTU, Gberefu 12.5 NTU, Suntan beach 11. 05 NTU and WHO stipulated limit is 10. These values are above W H O stipulated limit. The water is slightly turbid. Turbidity of water is the cloudiness of water caused by the presence of suspended particles (organic and inorganic matter) or colloidal matter that obstructs light transmission through the water. Although turbidity is not a big threat to health, it can have a negative implication on peoples' acceptability of water (Okoro, 2017 and WHO, 2011).

Chloride was present in the water samples in substantial quantities, but below the WHO, permissible limit of 250 mg/l. The high levels of chloride in water can corrode water pipes, which in turn makes water harmful. Lead was also low in water samples. It was entirely below the WHO limit High levels of lead in water could have teratogenic effect, dysfunctionin kidney, damage the central nervous system and peripheral nervous system, joint and reproductive system. It can also reduce the intelligent quotience (IQ) a child a cause neurological dysfunction.

The mean value of iron was high in Suntan and Alpha beaches but below the WHO limit in Bar Beach and Gberefu Beach. Iron is good for the body and uses for the formation of haemoglobin used in oxygen and electron transfer. Excess iron can lead to damage of tissue due to the accumulation of free radicals. It can also cause drowsiness, quick increase in pulse rate and coagulation of blood in blood vessels. Deficiency of iron leads to anaemia and neurodegenerative dieasess. The copper concentration in the samples ranges between 0.14-0.104 mg\l which is entirely below the WHO standard of 1.0mg\l. Copper is essesntial for human life but in excess can cause the development of chronic anaemia, liver and kidney damage, vomiting, headache, Wilson's disease and diarrhea in children (Asmaigba et al., 2011). Copper accumulates in the liver and brain. Iron (Fe) and Copper (Cu) have been categorized as being essential for human life at moderate levels.

The mean value of zinc in the samples is very minute and below the WHO permissible limit. It is one of the essential trace elements that play a crucial role in the physiological and metabolic process of many organisms. Excess of it in water can reduce immune function and levels of high- density lipoproteins (Harmansecu *et al.,* 2011) and result in impairment of growth and reproduction (Obiajunwa *et al.,2009*).The mean sulphate of Bar Beach was 5.93mg/l, Alpha beach was 5.47 mg/l, Gberefu 5.13 mg/l and Suntan beach 5.3 mg/l respectively while the WHO permissible limit is 150 mg/l. The quantities of sulphate in these beaches are thus within the permissible limit.

Heavy metals analysis showed that mean level of Arsenic of Bar beach was 0.209 mg/l, Alpha 0.265 mg/l, Gberefu 0.344 mg/l, Suntan 0.52 mg/l, and the WHO limit is 0.01. Mean value of Lead in Bar Beach was.003 mg/l, Alpha 0.0009 mg/l, Gberefu 0.0006 mg/l and Suntan 0.0007 mg/l which are quite below the permissible limit of 0.015 mg/l stipulated by W H O. High levels of lead in water could cause a bitter taste in water. It could also have teratogenic effect. It cause dysfunction in the kidney, joints and reproductive system. It can also damage the central nervous system and peripheral nervous system, reduce the intelligence quotient (IQ) of a child and neurological dysfunction. The volume of arsenic is very high and of health concern. The result showed that some of the beaches were more polluted than others by a particular metal due to the usual anthropogenic activities in the area. The researcher also observed from the heavy metal analysis and the result of the study that heavy metals like arsenic, copper and iron are above the stipulated limit, but lead, zinc, calcium and chloride were below. There was no trace of nickel and mecury. The presence of these heavy metals especially arsenic makes the water unwholesome for human consumption. Several studies have shown that ingestion of, breathing in or swimming in high arsenic concentrated water cause sore throat, nausea, vomiting, abdominal pain, diabetes, diarrhea, decreases red and white blood cell. It could also cause abnormal heart rhythm, heart attack, damage to blood vessels and a sensation of pin and needles in hands and feet. (hyperkeratosis), skin, liver and bladder and lung cancer, pulmonary and cardiovascular diseases.

This agrees with the findings of Inobeme (2014) and Okoro (2017) that the presence of lead and other heavy metals like arsenic, cadium, among others causes diseases, and they are carcinogenic to health. They also lower the IQ of children; injure pregnant women and their unborn baby, lower birth weight, fetal malformation and death (ATSDR, 2007 & The International Agency for Reasearch on Cancer (IARC), 2007). The high concentration of heavy metals in the water implies potential risk to human health because they are neither removed nor detoxified through metabolic activities (Udensi, 2010). This revealed that the entire water samples were polluted with heavy metals. This has health implications and can also militate against tourism development in the study area.

The study revealed that the BODs was entirely below the WHO stipulated limit of 6.0 except that of Alpha beach that was 7.03 mg/l, which is above the WHO stipulated limit of 6.0 mg/l.The highest value of chemical oxygen demand of both Bar beach, Suntan and Gberefu were between the ranges of 4.65-4.84 which is within WHO permissible limit of 5 but the value of Alpha is the highest which is above the WHO recommended limit. The quantities

of oil and grease. This implies that there was an inflow of sewage discharges, oil spills, industrial chemicals, high organic matters, fertilizers from nearby farms and other heavy pollutants in the beach. This showed that these beaches were heavily polluted due to unhygienic nature of the beaches.

The result for the biological test (Microbial analysis) revealed that high values were obtained for the total plate count and total coliforms. Coliforms (total coliforms) are a large group of rod-shaped gram-negative organisms that ferment lactose with the production of acid and gas when incubated at 37°C (Edberge *et al.*, 2000). The mean values of total plate count (cfu/100ml) are Bar beach 58 (cfu/100ml), Alpha beach 81.3 (cfu/100ml), Gberefu 40.3(cfu/100ml) and Suntan beach 38(cfu/100ml) and WHO permissible limit is (0).The total plate count is very high. The mean values of total coliforms were Bar Beach 35.3 cfu/ml, Alpha beach 47.7 cfu/ml, Gberefu 28 cfu/ml and Suntan beach 24.3cfu/ml which were above WHO permissible limit of (0 cfu/ml). The value ranges between 47.7 (cfu/100ml) and 24.3 cfu/100ml. High values were also obtained for the total coliforms. There was a heavy volume of coliform in the water samples. The suspected coliform bacteria in the study area include Escherichia coli, which causes urinary tract infections and meningitis.

It is good to note that the presence of bacteria and coliform in these water samples is an indication of contamination. In this study, the result obtained is as a result of the unhygienic environment of these beaches. The researcher observed wastes that were disposed in and around these beaches. Some of these beaches are polluted due to the discharge of pesticides, fertilizers, oil spillage from ship, flying boats, and effluent from industries, litters e.t.c. damaging flora and fauna in these areas. These are severe threats to these beaches. People that live around these beaches, chemical industries and tourists that visit these beaches also have degraded the physical appearance of these beaches and beach environment with solid and liquid wastes , industrial waste, litterings and human excreta,. There are noise and air pollution from automobiles , boats, power generating plants, e.t.c. All these have reduced the quality of these beaches for recreational activities. Litter is a severe problem on the beach. Beach aesthetics is a crucial issue for the economy since unkept beach repels tourists. Others have found out that absence of litter is essential factor for users when selecting a beach (Balance *et al*., 2000; Duck *et al*.,2009; Tucher and Williams, 2008).

Similar result have been reported for microbial analysis of sachet, borehole and beach water conducted inAba, Owerri, ondo, Minna, Nsukka and Rivers State(Agwu et al., 2013, Peter Ikechukwu et al.,2015,Olajubu and Ogunika, 2014, Omalu et al.,2012, Okoro, 2017 and Obinwanne, 2016). The water can be toxic and carcinogenic because of high level of heavy metal and heavy loads of coliforms that are present in them. This makes the water unwholesome for drinking and recreational activities. This is in agreement with the 2002 report on the river Kaduna that showed a considerable increase in loads of population, which is the primary source of water to Kaduna city. WHO(2011) stipulates that water intended for human consumption and recreation should contain no faecal indicator,. Hence faecal contamination of beach water is a severe challenge towards the development of tourism in this area studied (Lagos State). Based on the above finding, it is necessary to treat the water before consumption and sanitize the beach environment and avoid dumping of solid and liquid waste in them to present the spread of disease. The presence of bacterial coliform in these water samples is an indication of contamination. WHO guideline states that total coliform count of water for drinking and other recreational activities should be zero per 100ml and there should be no E.coli or faecal coliform per 100ml of water made for drinking (WHO, 2016).

In this study, the result obtained is as a result of the unhygienic environment of these beaches. The researcher observed waste that was disposed in and around these beaches. Heavy loads of coliform in the water makes the water unsafe and unacceptable for drinking and recreational activities because it indicates recent microbial activity (WHO, 2011). WHO (2011) stipulates that water intended for human consumption should contain no faecal indicator. Hence faecal contamination of beach water is a serious challenge towards the development of tourism in this area studied (Lagos State). The water is toxic and can be carcinogenic because of the high level of some heavy metals and coliforms that are present in them.

Conclusion

The research work centres on comparative analysis of water samples of selected beaches in

Lagos State, Nigeria and Implication for tourism development. The beaches studies are Suntan, Gberefu, Bar beach, and Alpha beach. The following instruments were used during the investigation: an interview with the aid of an interview guide\ schedule and field observation with the help of observation checklist. . The study assessed the quality of water samples from these selected beaches and the result was compared with World Health Organization (WHO) standard. The result and analysis revealed that some of the parameters were within the WHO recommended limits. They includes Ph, temperature, odourless, conductivity, TDS, total hardness, total acidity, total alkalinity, chloride, sulphate, zinc, iron, copper, calcium, magnesium, lead and cyanide. There were no traces of Nickel and mercury. Those above WHO recommended limits include TSS, TDS, turbidity, Arsenic, manganese, total plate count and total coliform.

The result showed that the water sample contained heavy loads of coliforms and heavy metals which render the water unsafe for human consumption and recreational activities. It is necessary to treat water from these beaches before consumption and recreational activities.

Recommendation

1. NAFDAC and other agencies should conduct extensive laboratory tests on all the beaches in Lagos State to know their status. Awareness should be created on the status of these beaches so that the public will understand the health implications of drinking beach water and using it for recreational activities. Beach water should be purified before consumption to avoid the spread of water borne diseases, skin infections and ensure that the health of the community, tourists and visitors is protected.

2.   Establishment of rules and regulations by the beach administrators that will help to control and restrict visitors' actions. These rules and regulations should be posted on the notice boards and billboards. These can be implemented by tour guides, lifeguards, police and other agents of management authority.

3.   There should be a beach maintenance culture. Routine cleaning and monitoring of beach water and beach environment should be done regularly to stop visitors and host communities from discharging solid wastes and other pollutants into the beach and beach environment. Provision of sewage treatment plants and the adequate number of litter bins at every strategic point of the beach and regular wastes collection will reduce beach litter and discharge of liquid and solid waste directly into the beach and beach environment. Creation of environmental awareness among the tourists, visitors and host communities about the importance of their activities on the beach environment. It will encourage beach users to dispose of their waste responsibly. Through such involvement of the public in clearing litters in beach areas, awareness is created; masses are educated on the importance of litter-free beach environment.

4.   The government should establish and implement rules to restrict the accumulation of contaminants below-established limit to protect human health and at the same time facilitate remedies for polluted soils that transcend these levels. Such water should not be used for recreational activities and food production. Appropriate measures should be taken to reduce contaminants loads in these soils. Information on the beach soil status should be made available to the public.

5.   All agricultural practices around beach areas should be prohibited because agrochemicals like pesticides and fertilizers are environmental pollutants that pollute water and estuaries. Such prohibition will help to conserve beach and coastal resources to ensure the sustainability of the fragile resources.

6.   It should ensure that the stakeholders and the host community are deeply involved in the protection and conservation of the beaches. Such recognition and engagement will make them have sense of belonging. They should be allowed to use norms and sanctions that can help protect and preserve the beaches.

REFERENCES

Adamu A, I,Mathew,J. T., Inobeme A & Egharerba, H.O (2017).Assessment of some Heavy Metal Concentration and Analysis of Physico-Chemical Parameters of Surface Soil within the Vicinity of Mina Railway Station, Niger State. *Journal of Applied Life Sciences International* 10 (1) P. 1-9.

Adejumo, O T.(2010) Eleko Rural Beach Initiative: Maximizing Economic Benefit of Domestic Tourism destination in lettoral Lagos community. Urban and Regional Planning Review, 2 (1&2); 91-98

Adepoju B. A, Issa O. A,Oguntibeju, O. O, Ayoola G. A & Adejumo O. O (2012).Analysis of some selected Toxic Metals in Registered Herbal Products manufactured in Nigeria. *African Journal of Biotechnology*,11 (26):6918-6922.

Adhikary, p, chardrasekharam H, Chadkraborty & D,. Karibe K. (2010) Assessment of ground water pollution in West Dewlhi,/India USING Geaostatostial Approach. Environmental Monetary Assessment, 167, pp. 599 – 613.

African Hospitality and Tourism(2007) African's Tourism Industry statistics 2005. African *Hospitality and Tourism (AHT) Journal*, 11(2), 38.

African Hospitality and Tourism (2008) world Tourism hit 898 million arrivals in 2007. *African Hospitality and Tourism (AHT)* Journal 12 (1), 19-20.

Agwu A, Awaja A.G.& Kalu A.U. (2013). The Assessement of Drinking Water source in Aba Metrophs, Abia State, Nigeria, Resources and Environment 2013, 3() :72 – 76.

Aland,E.O (2010). Beach Management: The role of Stakeholders.*IOSR Journal of Humanities And Social Sciences* 21 (10) Vo1 6, 20-31.

Alegre, J, & Garau, J. (2010). Tourist Satisfaction and Dissatisfaction. *AnnalsofTourismResearch* 37(1) 52.73.

Anago,J .A (2016).Seriki Abass Slave Trade, Badagry, And The History That Refuses to Die. *IOSR Journal of Humanities And Social Sciences* 21 (8) Ver 1   42-47.

Analche Resource (2000). Atomic Absorbtion Instrument Spectrophotometer.Available on http://delloyd. 50 megs. Com/moreinfo/AA.html (Accessed on1st Dec, 2017)

Anayo, J.A (2016). Seriki Abass: Slave Trade, Badagry, And The History That Refused To Die.

IOSR Journal Of Humanities And Social Sciences Vol. 21 Issue 8 pp42-47.

Anton, M.; Omar D, Eduardo, J. & Andrew, S. (2013). Sandy beach conservation and recreation: Guidelines for optimizing management strategies for multi-purpose use. *Journalofoceanandcoastalmanagement* 71, p 256-268.

Anunobi, H.N, (2014) Role of infrastructural facilities on beach Tourism: A study of port Harcourt Tourist Beach and Iffoko Beach, River State, Nigeria.M.Sc Thesis of Department of Hospitality and Tourism management .Imo State.

Anunobi, H.N. (2014). Role of infrastructural facilities in Port Harcourt Tourists Beach and Iffoko Beach River State, Nigeria. *Jounal of Tourism and Heritage Studies.Vlm 5 No 1&2.pg 82101.*

Anyadike, Raymond N.C (2009): *Statistical Methods for the Social and Environmental Sciences.* Ibadan: Spectrum Books Limited,

ATSDR, (2007). Agency for Toxic substances and Disease Registry. Division of Toxicology and

Environmental Medicine #7440-38-2 (http://www.atsdr.edu.gov) tox fag. Html.Taxicology Profil of Lead And Arsenic (Accessed on 10 May, 2017).

Aziekwe, N.E (2008).Prospects and Constraints of Agulu Lake in Tourism Development in Anambra State. Unpublished MA Thesis, Department of Archaeology and Tourism UNN.

Ballance, A; Ryan, P.G & Tarpie (2000). How much is a clean beach worth? The impact of litter on beach use in the Cape peninsula, South Africa. *SouthAfricajournalofscience*, *96*, *210213* Bascom, W.(1980). Wave and Beaches. New York: Anchor Press.

Bayo,S .(2014) A Case Study on "Beach Tourism potential of Odisha" *Journal of Kashmir for Tourismandcateringtechnology* vol 1. No 2 p.12-22

Botero, C. and Hurtado, Y. (2009) Tourisms Beach resort as a classification tool for integrated Beach Management in Latin America. International Approach of coastal Research in theory and practices, coast line Reports (13) p.133-142.

Boundless(2016).The structure and properties of water. Available at http//www. boundless.com/chemistry/textbooks/bouthless (Accessed 10th May, 2018).

Burkart, C .U. & John, O.O. (1981) Special interest Tourism: A Review. London: Bechaven Press.

Cater, E. (1987). Tourism in the Least Developed countries, *Annals of Tourism Research*, 14:202206.

Chiroma T.M, Ebewele R.O & Hymore F.K (2014).Comparative Assessment of Heavy Metal

Levels in Soil, Vegetable and Urban Grey Waste Water Used for Irrigation Yola and Kano. *Nigeria International Refered Journal of Engineering and Sciences.* Vol.3, Issues 2 P.1-9.

Chude (2011) Beach tourism:a graphic perspective, Century.Journal Of Coastal Research.No35 pp74-84

Chude, V.O, Malgwi, W.B, Amapu,I.Y, and Ano,O.A. (2011).Manual on Soil Fertility Assessment. Revised Edition. Lagos:Soko pub.Co.

Cobbina S.J., Duwiejuah A.B., Quansah R. Obiri S. and Noel B. (2015). Comparative Assessment of Heavy Metals in Drinking Water sources in two small-scale mining communitie in Northern Ghana. *International Journal of Environment.Res. Public Health 12, 10620 – 10634.*

Edbergs S.C, Rice E.W, Karhim R.J. and Allen M.J. (2000). Escherichia Coli. The Best Biological drinking water indicator for public health protection. Journal of Applied Microbial. Vol 88 P.1068-1168.

Egwari L, Aboaba O. (2002). Environmental Impart on the Bacteriological Quality of Dominic Water Suppliers in Lagos, Nigeria. Revised Saude Publication, 36 (4): 513 – 520.

Ekechukwu, L.C. (2002). Tourism Potentials of Archaeological sites in Igbo land. Nsukka. Okigwu cuesta as a case study.Unpublished Ph.D thesis university of Nigeria Nsukka, Department of Archaeology and Tourism.

Encyclopedia America (2004). Beach and beach plant vol 3 pg 387-392.

Eunbit J.O; Hong S .Y, Yong. C. S, Jooyong, L. and Jung L, L. (2004). Economic analysis of beach safety level on the contingent valuation in Haenndae beach.

Journalofcoastalresearch, *specialissueNo*. *72*.

Eze-Uzoamaka, P.I.(2006). Tourism and Community Development in Nigeria. In Okpoko, P.U (ed). Issues in Tourism Planning and Development. Nsukka: Afro Orbis Publications Ltd.

Fadipe, A.S. (2007). Basic Principles and Practice of Tourism. Lagos:Media Abe Publishers.

Foster-Carter, A (1986). The Sociology of Development. Loncashire: Causeway Press Ltd.

Gautam, P & Irfan, A (2011).Heavy Metals Concentration Assessment of Kanhargon Dan Water

Near34 Chirindware City, Acta Cimica and Pharmaceutica Indica.7-

Gerhard & Hugles (2003). Coastal Tourism.*Annals of Tourism Research 30(2) 220-239.*

Gomez, M. B. (2005). Weather, climate and tourism: a graphic perspective, *Annals of tourism research,* 32 (3), 571-591.

Graham-Daughlas. A.T, (2008). The Preservation of land, culture and Wildlife. In Aremu. D. Cultural and Eco-Tourism Development in Nigeria (ed) Ibadan: Spectrum Books Ltd.

Guide To Tourist Attractions In Lagos State (nd).Traditional Festivals In Lagos State, Reasons And Date of Celebration.

Gunn, C.A.(1994 3rdEd.). Tourism Planning, Washington DC:Taylor & Francis.

H$_2$O for Health (2012) Alkaline Water vs Acidic Water. Available at: www.h$_2$oforhealth.com/alkaline-water-vs-acidic-water (Accessed on May,2017)

H$_2$O for Health (2012). WHO Guidelines for drinking water quality general: WHO

Holloway, C.J. (1989). The Business of Tourism. (Third Edition) London: Pitman Publishing, A Division of Longman Group U.k Ltd.

Holloway, C.J. (1992). Travel and Tourism. London : Macmilan Education Ltd.

Houston, J.R (2008). The economic value of beaches: a 2008 update. Shore and beach, 76 (3),22-

26.(http://hdr.undp.org/er/statistics/indices.(Accessed on 21/10/2014).

 IARC (2007) International Agency For The Research On Cancer, Cadmium, Mecury, Arsenic.Vol 50.

Ifegbo, L.I .(2015).Assessment of Continuity and Change in Selected Traditional Festivals in Imo State, Nigeria.Unpublished Ph.D Thesis, Department of Archaeology and Tourism University of Nigeria Nsukka.

Ilechukwu , I & Okonkwo, C. (2012). Heavy Metals & physicochemical parameters of portable water in Nnewi, Anambra State. *International Journal of Current Research*. Vol. 4, p. 06 – 11

Instiudo da Conservatodo Natureza ICN (2002). Handbook on Beach Classification.

Interorganisational Committee on Guide and Principles (1994).Guide and Principles for Social Impact Assessment, vol. 12, No.2.

IPCC (2007 b).Climate Change.The Physical Basis,Contribution of Working Group To The Fourth Assessment Report James, N .O (2000) Beach Management and Impact on Envinonment: Nigeria Case

Judor, D.T.; Williams, A.T.(2003). Public perception and opinion of visible beach aesthetic pollution: the utilization of photography. *Journalofcoastalresearch19*, *1104-1115*.

Lenitech, (2017).Water conductivity.(Available at www.lamtech/application/unhaing/endutivity/water-constitual.htm. Assessed on 20th April, 2018).

Maclntosh, R.W and Goeldner, C.R. (1990). Tourism Principles, Practices and Philosophy. Sixth Edition. John Wiley and Son, New York.

Markoric, M; Salta, A; Skaricie, Z & Trumbic, I. (2009). Sustainable coastal tourism: an integrated planning and management approach: Milan, France: United Nation's Environmental preprogram

Mbah C.E.& Muhammed H. (2015) Examination of two brands of sachet watch for pathogenic micro-organism. World health observation 2015:7(1).

Mcintoch, R.W and Geoldnery, C.R (1986) Tourism Principles, practices and Philosophies. New York: Willey Publisher.

Micallef, A. & Williams, A.T (2004). Application of a novel approach to beach classification in the Maltese Island.Journal of Ocean and coastal management 47, 225-242.

Mihalic,T. (nd). Economic Instruments of Environmental Tourism Policy Derieved from Environmental Theories.google.com/search/ environmental theories/miharicarticle.Accessed 2nd December, 2017.

Miller, M.L (1993). The rise of coastal and marine tourism, ocean and coastal management *Journal of Coastal Reasearch Vol 20, 181-199.*

Mitchell, A. (2005): *The ESRI Guide to GIS Analysis, ESRI Press.* Vol 2.

Mohammed,S.A & Folorunsho J.O(2015)Heavy Metal Concentration in Soil Amaranthus Retroflexus Growth on Irigated Farmlands in the Makera Area, Kaduna, Nigeria. *Journal of Geography and Regional Planning* Vol. 8 (8).P.210-217.

Murphy, P.E. (1985).Tourism: A Community Approach. London: Routledge.

Nash, M. (1993). "Introduction, Approaches to the study of Economics Growth". *Journal of Social Issues*, vol 29. No. 1 1-12.

National research council (1995). Beach nourishment and protection. Committee on beach nourishment and protection, marine board Washington, DC: commission on engineering and technical systems.

Ndebula C, Jidanne G.C., (2010). Domestic water use in selected settlements in the sudanosarahan region of Nigeria. *International Journal of Water & Soil Resources. Vol. 1 Nos 13*

Nigeria Tourism Development Commission NTDC (2006).Tourism in Nigeria. wtttp://www.nigeria tourism.com. Accessed on10th December,2024.

Nigeria, Investment promotion commission (2000) (http://www.nipcnigeria.org/.opp/tourism/tourism/.htm Assessed on 12th January, 2022).

Obiajiunwa, E I, Adeleke, C.A & Loareweju, R.O (2009) Essential & Trace Element contents of some Nigeria Medical Plant. *Journal of Radioanalytical & Nuclear Chemistry*, 252(3):473476.

Obianjunwa E.I., Adeleke C.A. and Loaviewaju R.O. (2009). Essential and Free Element Contents of Some Nigeria Medical Plants. *Journal of Racho analytical and nuclear chemistry, 252 (3); 473 – 476.*

Obinwanne, C.O & Okpoko P.U (2015). Comparative assessment of coastal tourism potentials of selected areas in Rivers State Nigeria. *International journal of scientific & technology research volume 4, issue 12,p. 22-33.*

Obinwanne, C.O (2016).The Challenges and Prospects of harnessing Coastal Tourism Potentials in Rivers State, Nigeria. Unpublished Ph.D Thesis, Department of Archaeology and Tourism University of Nigeria Nsukka.

OECD (2008). Tourism in OECD countries 2008: trend & policies. Paris: organization for economic co-operation and development.

Offiong, D.A. (2001) Globalization, post-interdependency and poverty in Africa Enugu: Fourth Dimention.

Ogundele,D.T,Adro A.A, & Oludele, O E. (2015) Heavy Metal Concentrations in Plants and Soil along Heavy Metal Traffic Roads in North Central Nigeria. *Journal of Environmental and*

Analytical Toxicology.Vol.5 (6):334-339

Okeibunor, J.C and Anigwom, E. E. (2002). Sociological theory: An insight into the Dominant view points Nsukka: Great A.P Express publisher.

Okoli, C. (2001).Tourism Development and Management in Nigeria. Enugu: Jee Pub. Com.

Okoro N. Nkwachukwu oziamara (2017).Comparative Analysis of water quality from different sources in Nsukka Urban Area, Enugu state, Nigeria.Unpublished M.sc thesis Department of Pharmaceutical and Medicinal Chemistry University of Nigeria Nsukka.

Okoye, E. O(2014) Beach Tourism In Nigeria :A Case Study Of Elegushi Beach Resort Lagos State.Unpublished M.sc thesis Department of Archaeology And Tourism, University of Nigeria Nsukka.

Okpoko, P.U (1990). The role of cultural resources in tourism in Nigeria, in Anda, B.W (ed), cultural resource management: an African dimension, Ibadan: Wisdom publishers Ltd

Okpoko, P.U and Okpoko, A. I (2002). Tourism in Nigeria. Nsukka Afro-orbis publications limited.

Okpoko, P.U. (2006). *Issue in Tourism Planning and Development.* Nsukka. Afro Orba Publication Co. Ltd.

Okpoko, P.U. (2012) .The State of Tourism in Nigeria. *Journal of Tourism and Heritage studies volm 1 No 1, pg 1-7.*

Onikoye, A.A (nd). A History of Lagos State,Nigeria.

Onwukuzor J.C. &Akuagbazie C.A. (2010). Assessment of the Quality of Bottle and sachet water social in Nsukka Town Agro-Science. *Journal of TroprocalAgroventure, Food, Environment and Extension, vol. 9, No. 2 pp. 104 – 110.*

Pallar, S (2013) Potential health impacts of hard water. *International Journal of Preventive Medicine; 4(8); 866 – 875.*

Parissa, K; Omidm, and Mohammed A. (2012) A systematic review on the statue of lead pollution and toxicity in Warri, Guidance for prevention measurey. *DARU Journal of Pharmaceutal Sciences 20:19.*

Payment, P., M, Waiter and A. Dutour (2003). Introducing Parameters for the Assessment of Drinking Water Quality – Chapter 2, pp. 47 – 73.

Pearce, D. (1995). Tourism Analysis: A Handbook. England: Longman Group Limited.

Pereiva, I.C, Jimenez, J. Medeivos C. Da Costa, R.M (2003). The influence of the environmental status of casa Caiada and Rio Doce beaches (N-E-Brazil) on beaches users. *Ocean and coastal management 46, 1011-1030.*

Phillip, M.R & Jones, A.L (2006). Erosion and tourism infrastructure in the coastal zone: problems, consequences and management. Tourism management, 27, 517-524

Rahmanian, N , Ali,S, Homayoofard M,Rehan, M,Sadef, Y, Nizami, A(2015). Analysis of physiochemical parameters to evaluate the drinking water quality in the State of Perak, Malaysia.*Journal of chemistry vlm 2.*

Redmond, D.A. (2008). Theory. Microsoft Encata 2008 (DVD).

Rogers C.D. (2013). Health effects of PH on Drinking water. Available at www.liverstrong.com/acticle/4976 39-white-ph-in-water-is-ton-high-for. Rostow, W.W. (1990). Stages of Economic Growth: A non- Communist Manifesto, Cambridge: Cambridge University Press.

Ruqia N, Muslim K,Muhammed M, Hamed, R,Naveed R, Surrya S,Nosheen A,Muhammad, S. Mohib U, Muhammad R, Zeenat, S (2015).Accumulation of Heavy Metals (Ni, Cu, Cd, Cr, Pb,Zn,Fe) in the Soil, Water and Plant and Analysis of Physico-Chemical Parameters of Soil and Water collected from Tanda Dam Kohat. *Journal of Pharmaceutical Sciences and Reseach Vol.7 (3) P.89-97.*

Smith, A. & Steinmaus, C. (2007). High Concentration of Arsenic in Drinking

Water.httt://www.rgs.org.(Accessed on 10th May , 2017)

Smith, M.K. (2003) Issues in Culture Tourism Studies. New York: Routledge.

Smith, S. (1994). The Tourism product. *Annals of Tourism Research,* 21(3) 582-595.

Smith, S.L. (1995). Tourism Analysis: A Handbook .Second Edition.England: Addison Weslay Longman Limited.

Sunil, K.T & Chippa R C. (2013). Analysis Of Water Quality of Bharatpur. *International Journal of Engineering f Inventions. Vol.2, pp 06-11.*

Travel Industry Association of America, (2000). Economic impact of travel in the USA, .

Washington DC travel industry association America: http://www.tia.orgtravel/econ/impact-asp

Tuned, A.M (2012). Harnessing tourism potentials for sustainable development: a case study of

Owu water falls in Nigeria. Journal of *sustainable* development in Africa, vol 14, No 1, 2012.

Uduma-Olugo, N and Onukwube, H.N. (2012) Eploring The coastal Tourism Potentials of Lagos. *Journal of sustainable development,* 5 (7), 156-165.

UN (2015) Transforming Our World:The 2030 Agenda For Sustainable Development. Available at www.un.org/2015/./120815 outcome-document-of-summit-for-adoption of the-post2015-development-agenda-pdf (Accessed on 2nd December,2024).

UN Atlas of the Ocean (2004). Recreation And Tourism (http:// www.oceansatlas.org Accessed on 10 th December, 2017.

UNEP-WHO (1992) .Sustainable Coastal Tourism:An Integrated Planning & Management

Approach.France: United Nations Environmental Programme

UNICEF (2008). Handbook on Water Quality. New York. UNICEF.

UNICEF (2008). Handbook on Water Quality. New York: UNICEF.

United State Environmental Protection Agency EPA (2016).Types Of Drinking Water Contaminants. Available at   http: epa.gov/ccl/types-drinking-watercontaminants.(Accessed on 10^{th}December, 2024)

UNWTO (1995) Global Tourism forecast to the year 2000 and Beyond. Vol 1 Madrid: WTO.

UNWTO (2007). World Tourism Organization Barometer. Vlm 5 No, (htt:// www.UNWTO.org.(Accessed on 20/10/2016).

Walker J.T and Walker J.R. (2011) Tourism concepts and practice New Jersey: person Education, Inc. publishing.

Wassan Ihan (2005) Water Purification method. Available ats

(http://www.sharenet/wassan14ch18/water-purification-methods-61592227 Accessed on 10 March,2017).

Water Aid(2007). Water aid Nigeria.

White, S (2015). Water Contamination; sources and solution available at (www.wgp mag.com (Accessed 15th March, 2018).

WHO & UNICEF Joint Monitoring Programme (2006) Meeting the MDG Drinking water & Sanitation target, the Urban and Rural Challenge of the Decade.

WHO (1992). Tourism Vission 2020. Madrid.

WHO (2010).Water for Health. WHO Guidelines for Drinking Water Quality.

WHO, (2004). Guidelines for drinking water quality 3rd ed. Geneva: WHO Press.

WHO, (2006). Guidelines for Drinking-Water Quality, 1st Addendum vol. 1. Recommendation.

3rd edition Geneva:WHO.

WHO, (2010) Fact sheets on drinking water. Available at htt://www.who.int/mediacentre/factsheets/f5391/en .(Accessd on 10th may, 2017).

WHO, (2011). Guidelines for drinking water quality. 4th edition, WHO press, Geneva Switzerland.

World bank (2002) "Millennium development goals: eradicate poverty and Hunger , Retrieved on

10th may, 2009 from http://www.developmentgoals.org/poverty.htm

World Tourism Organization (2001). Tourism 2020 vision. Madrid: WTO.

World Tourism Organization (2003a). Crises Guidelines for the Tourism industry. Madrid: W.T.O.

WTO (2000).Tourism Highlights 2nd Edition 2000.Madrid : Spain WTO

WTO (2004) "Mission for the New Millennium, http://www.world tourism.org/about/o/eng/about to htm about to htm. www.africawriter.com.Accessed on

20/10/2014 www.jotu.en/nndex.pup/tourism-management/14harnessing.tourismpotentials-for-local-economic-development-in-ondo-state-of Nigeria.

Yehuda, L.K & O sleeb, J.P. (2010). Determinant Of Coastal Tourism: A Case Study of Florida Beach Counties. *Journal of Coastal Research*.Vol.26 No.6 pg 1149-1155.

Yehuda,L.K, N Osleeb, J.P &Mariano, R.V. (2004).Tourism Generated Earnings In The Coastal

Zone:A Regional Analysis.*Journal Of Coastal Research*.Vol.20 No.4

 Zaigham, H, Zubair,A., Khalid U,Mazhar Isam, Rizwan,U, Jabar Z. (2012).Civic pollution and its effects on water quality of River Toi at District Kohat, NWFP. Research Journal of Environmental and Earth Sciences Vl. 4, 5 P.89-97.