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Influence of Energy Use in the Sustainability of Tourism Resources in Uyo, Akwa Ibom State

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ABSTRACT

The study investigated the Influence of energy use in the sustainability of tourism resources in Uyo, Akwa Ibom State. The study raised three research questions which were aimed to find out the sources of energy use in Uyo, Akwa Ibom State, the influence of energy use on tourism destination in Uyo, Akwa Ibom State and the way in which tourism destination can be sustained through the use of renewable energy sources. One alternate hypothesis was formulated (there is a significant relationship between energy use and tourism resources), this was aimed to investigate the relationship between the variables. The hypothesis was tested at 0.05 alpha level of significance using a chi square statistical test.The study uses descriptive survey design, and the population used was a total of two hundred and sixty (260) drawn from three tourist destinations in Uyo. Using Taro Yamane, an approximate sample size of one hundred and fifty eight (158) was obtained, a well validated 38 items questionnaire were issued under two sections. The first section was the demographic information which contained seven items; the second section contained thirty one (31) items which were aimed to elicit information from respondent with respect to the research questions raised. Out of the one hundred and fifty eight (158) questionnaires issued, one hundred and fifty (150) were filled and returned. The data was analyzed using descriptive analytical tools such as frequencies and percentages, mean and standard deviationThe findings from the study indicated that Uyo, Akwa Ibom State uses nonrenewable energy, mostly fossil fuels, although some renewable are use , findings also showed that energy use have severally influences on tourism destination both natural, cultural and social, findings from the research hypothesis indicated that a relationship exist between energy use and tourism resources. From the findings it was recommended that government should enact laws and principles and strongly enforce existing principals such as the polluter pay principles to ensure the individual, industries and companies takes responsibility for any pollution caused by them, this will make people more environmentally friendly. Carbon foot print should be improve through fuel economy and reduce driving. There should be energy efficiency by planting trees, using led bulb etc.

Keywords: *Influence, Energy Use, I Sustainability, Tourism and Resources*

INTRODUCTION

Energy is the driving force of industrialization and no development without ensuring adequate generation, distribution and utilization of energy (sambo, 2009). Different field of sciences studies energy from various dimensions. In physic energy is define as the ability to do work, it is actually a force multiplier that enhances man's ability to convert raw materials into finish product thus producing an array of valuable services (Sorensen 1980). According to Jeffrey (2014) we can convert energy from one form to another (e.g. mechanical-to-electrical) energy which leads to the concept of conversion efficiency and entropy. He further explained that they are two types of energy (transitional and stored) and six forms of energy (mechanical, thermal, electrical, chemical, electromagnetic and nuclear).

Energy can neither be created nor destroyed, civilization get the energy its need from various resources, such as fossil fuels, nuclear fuels etc, which can be classified as renewable and non renewable. In a typical lighting strike 500 megajoules of electric potential energy is converted into the same amount of energy in other forms, mostly light energy, sound energy and thermal energy (Scrobbie, 1998). The total energy of a system can be sub divided and classified in various ways. For example classical mechanics distinguishes between kinetic energy,

which is determine by an object movement through space and potential energy which is a function of the position of an object with a field, gravitational, energy, thermal energy, several types of nuclear energy (which utilizes potentials from the nuclear force and the weak force) electric energy from electric field) (Loffs et al, 2014). In the international unit of systems the S.I unit of energy is the Joule, it is derived in unit. It is equal to the energy expended (or work done) in applying a force of Newton (through a distance) (Wikipedia, 2017).

In chemistry, energy is the attributes of a substance as a consequence of its atomic, molecular or aggregate structure, since a chemical structure is accompanied by a change in one or more of this structures, it is invariably accompanied by an increase or decrease of energy of the substance involved (Koltz,2008).

In biology energy is an attribute of a biological system from the biosphere to the smallest living organism (Hartley, 2012). Sunlight radiant energy which is captured by plant as a chemical potential energy in photosynthesis, when carbon dioxide and waters (two low-energy compounds) are converted into high energy compounds carbohydrates, lipids and proteins (Vaclav, 2008). Release of the energy stored during photosynthesis as heat or light may be triggered suddenly by a spark in a forest fire or it may be made available more slowly for animal or human metabolism, when these molecules are ingested and catabolism is triggered by enzyme action (Vaclav, 2008).

In earth science like geology, continental drift, mountain ranges, volcanoes and earthquakes are phenomenon that can be explain in terms of energy transformation in the earth interior while meteorological phenomena like wind, rain, hail, snow, lightening, tornadoes, and hurricanes are all result of energy transformation brought about by solar energy on the atmosphere of the earth. (Walding et al, 1999). In cosmology and astronomy the phenomena of stars, nova, supernova, quasars and gamma ray bursts are the universe's highest-output energy transformation of matter (Vaclav, 2008).

Bates and Moore, 1992 said the production and use of energy creates serious extensive environmental effects at every level, in every country. They further explained that the impact may be more serious in developing countries than in developed countries as developing countries depends more on natural resources and lack the economic strength to withstand environmental consequences. Energy can be classified based on the following criteria.

Primary/secondary energy, Commercial/non-commercial energy, and Renewable/nonrenewable energy

Primary/Secondary Energy

Primary energy sources are those that are either found or stored in nature. (Amlan, 2011) Common primary energy sources are fossil fuels (coal, oil, natural gas,) and biomass (such as wood). Other primary energy sources available include nuclear energy from radioactive Substances, thermal energy stored in earth's interior, and potential energy due to earth's gravity (Mahesh 2010). Primary energy sources are mostly converted in industrial utilities into secondary energy sources; secondary source is one that is made using primary resources for example coal, oil or gas converted into steam and electricity (Bureau of energy efficiency, 2012). Primary energy can also be use directly. Some energy sources have non-energy uses, for example coal or natural gas can be used as a feedstock in fertilizer plants. Energy under this category can be renewable or non-renewable. For example Crude oil must be put through an oil refinery before it turns into secondary fuel (useable fuel) like gasoline, diesel or kerosene.(Bureau of Energy Efficiency, India) Coal is usually put into a coal fire power plant to generate electricity wind must be harnessed by a wind turbine before it can generate electricity. Secondary energy are energy currencies and aren't primary energy sources, this implies that they must be made example is electricity

Commercial and Non Commercial Energy

Commercial Energy: The energy sources that are available in the market for a definite price are known as commercial energy (Subramahian, 2014). By far the most important forms of commercial energy are electricity, coal and refined petroleum products. Subramahian explains that Commercial energy forms the basis of industrial, agricultural, transport and commercial development in the modern world. In the industrialized countries, commercialized fuels are predominant source not only for economic production, but also for many household tasks of general population. Examples: Electricity, lignite, coal, oil, natural gas etc.

Non-Commercial Energy: The energy sources that are not available in the commercial market for a price are classified as non-commercial

energy (Bala, 2013). Non-commercial energy sources include fuels such as firewood, cattledung and agricultural wastes, which are traditionally gathered, and not bought at a price used especially in rural households; these are also called traditional fuels (Bureau of energy efficiency, india). Non commercial energy is often ignored in energy accounting. Example: Firewood, agro waste in rural areas; solar energy for water heating, electricity generation, for drying grain, fish and fruits; animal power for transport, threshing, lifting water for irrigation, crushing sugarcane; wind energy for lifting water and electricity generation.

Renewable and Non Renewable Energy

Renewable Energy

These are energy obtained from renewable sources which are naturally replenished on human timescale, such as sunlight, wind, rain, tides, waves and geothermal heat (Ellabban et al 2014). Renewable energy resources exist over wide geographical areas, in contrast to other energy sources, which are concentrated in a limited number of countries. (Wikipedia 2017) Rapid deployment of renewable energy and energy efficiency is resulting in significant energy security, climate change mitigation, and economic benefits (International Energy Agency 2012). While many reneweable energy project are large scale, renewable technologies are also suited to rural and remote areas and developing countries, while energy is often crucial in human development (World Energy Assesement 2001). According to Banki moon the united nations secreatery general, renewable energy has the ability to lift the poorest nations to new level of prosperity (Banki moon, 2011). There are many types of renewable energy which include;

Solar

This form of energy depends on the nuclear fussion power from the core of the sun.This energy can be collected and converted in a few different ways. Solar power is the conversion of energy from sunlight into electricity either directly using photovoltacics (pv), or indirectly using concentrated solar.power systems use lenses or mirrors and tracking systems to focus a large area of sunlight into a small beam. photovoltic cells convert light into an electric current using the photovoltic effects. In 2014 the International Energy Agency projected that in its renewable scenarios by 2050, solar voltatics and concentrated solar power could contributes about 16 and 11 percept respectively of the worldwide electricity consumption, the projected solar will be the world largest source of electricity

Wind Power

The movement of the atmosphere is driven by difference in temperature at the earth's surface when lit by sunlight. Wind energy can be use to pump water or genertae eletricity, but requires extensive area coverage to produce sufficient amount of energy(bereau of energy efficiecy, 2012)

Hydroelectric Energy:

This form uses the gravitational potential of elevated water that was liften from the oceans by sunlight. It is not strictly speaking renewable since all resevoirs eventually fill up and require very expensive excavation to become useful again (Dohn, 2016). Hydro electricity is produced by th movement of water , it is usually made with dams that block a river to a resevior or collect water that is pumped there. When the water is releaseed, the pressure behind the dams forces the water down the pipes that lead to a turbine. This cause the turbine to turn , whch turns generator which make electricity.

Biomass:

Biomass is an industry term for getting energy by burning wood, and other organic matter. Burning biomass releases carbon emissios around a quarter higher than burning coal, but has been classified as a renewable energy sources by the European Union (EU) and the United nation(UN)legal framework, because plant can be regrown, This is the term for energy from plants (Mle page, 2016). Energy in this form is very commonly used throughout the world. Unfortunately the most popular is the burning of trees for cooking and warmth.this pocess release copious amount of carbon dioxide gas into the atmosphere and is a major contributor to unhealthy air in many areas. Some of the most modern forms of biomass energy are methane generation and production of alcohol for automobile fuel and fueling electric power plants.

Hydrogen and Fuel Cells:

(Bereau of Energy Efficiency, india, 2012) These are also not strictly renewable resources but are very abundant in availability and are very low in pollution when utilized. Hydrogen can be burn as fuel typically in a vehicle, with only water as the combustion product. This clean burning fuel can a mean a significant

reduction of pollution in cities. Or the hydrogen can be use as fuel cells, which are similar to batteries, to power an electric motor.in either case production of hydrogen require abundant power. Due to the need for energy to produce the initial hydrogen gas, the result is the relocation of pollution from the cities to the power plants.

Geothermal Power:

This is power generated by geothermal energy. Technologies in uses include dry steam power stations,flash steam power stations, binary cycle power stations. (Geothermal energy Association, 2010) Geothermal energy is considered a sustainable, renewable source of energy because the heat extraction is small compared with the earths heat content (Rybach 2007)

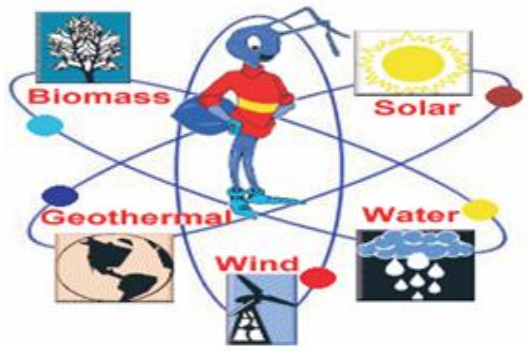

Figure1. *Renewable energy resources, diagram obtained bureau of energy efficiency, India*

Non-Renewable Energy

Nonrenewable energy is the conventional fossil fuels such as coal, oil and gas, which are likely to deplete with time.

Fossil Fuels

Fossil fuels are derived from non-organic matter which has been trapped between layers of sediment within the earth for millions of years. The organic matter especially plants, have decomposed and compressed over time leaving what are known as fossil fuels deposit., these deposits and the materials produce from them tend to be highly combustible, making them an ideal energy sources. They are difficult to obtain as they are typical retrieved through drilling or mining, but fossil fuels are worth the effort for the sheer amount of energy they produce (your dictionary.com, 2017)

Crude Oil/Petroleum

Crude oil is a non-renewable source that builds up in liquid from between the layers of the earth crust. It is retrieved by drilling deep into the ground and pumping the liquid out, the liquid is then refined and uses to create many different products. It is a very versatile fuel and is use to produce things liken plastic, artificial food flavoring, heating oil, petrol, diesel, jet fuel and propane. (your dictionary.com,2017)

Gas

Natural gases gather below the earth crust and like crude oil must be drilled and pump out. Methane and ethane are the most common type of gases obtained; these gases are most commonly used in home heating as well as gas ovens and grills.

Coal

According to (your dictionary .com) this is the last of the major fossil fuels, created by compressed organic matter, it is solid like rock and it is obtained through mining. Coal is most typically used in home heating and the running of power plants.

Nuclear Fuels

The other form of non-renewable sources to use to produce energy, it is obtained through the mining and refining of uranium ore. Uranium is a natural occurring element fond within the earth's core. Most uranium deposit occur in small quantities which mines gather together, refine and purify, once gather the uranium is brought together and compounded into rods, the rod are then submersed into tanks of water, when it reaches critical mass uranium begins to break down and produce energy which heat the water it is immersed in. this is known as fission. The heated water then creates pressure which drives the turbines that generate the electricity we use today. They are the cleanest of the non renewable sources of energy. (your dictionary. Com, 2017)

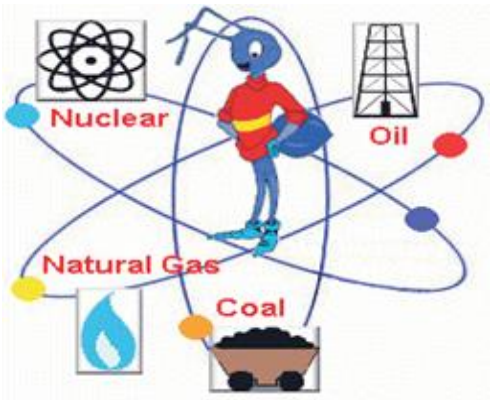

Figure2. *Diagram of non-renewable energy from bureau of energy efficiency, india, 2012*

Scenarios are defined broadly as projections that helps illuminate the future (Aabakken, 2000)

Scenarios refers to the description of possible, actions or events in the future (Cambridge English dictionary 2015) If one talk about a likely or possible scenario it refers to the way in which a situation may develop (Collins English dictionary2015). Scenarios are the best way of understanding energy assessment and they are often base on internal key relationship and driving force of change which is derived from our understanding of both history and the current situation. (World energy council, 2010)

Energy scenarios therefore provide a framework for exploring future energy perspectives including various combinations of technology options and their implications (IEA, 2014). Energy systems are complex, their behavior may be uncertain and is not always well understood and information about them is often incomplete (IEA, 2014).

According to WEC 2013, energy scenario plays a crucial role in the general world debate about the future of energy supply. They are important instrument to support decision-making in politics and economy being used by a multitude or organizations ranging from bodies of national governments and transnational organizations to private companies and banks. Their context of usage ranges from the development of general strategies to the assessment of particular political or economic options. Energy scenarios have to be applicable in situation of decision-making and at the same time, energy scenarios fulfill the standards of scientific practice. (WEC, 2013). Energy sources have positive and negative implications on tourism (Prinsloo, 2013)

According to (Gustavsson et al, 2011) energy systems that we see today rely heavily on fossil fuels and non-renewable sources. The energy systems are as result of many decades of development and optimization towards being competitive and safe. Changes can occur in terms of what kind of fuels used, technologies used to generate and transfer energy as well as technologies used to transport people and goods. The use of fossil resources in the energy system has been a main contributing factor to the increase in greenhouse gases (GHG) in the atmosphere (inter governmental panel on climate change (IPCC 2007). The challenges presented by climate change pose a great risk that may threaten the very existence of the human society. World Health Organization (WHO, 2003).

Tourism is an activity that involves the movement of people from one location to another, this movement takes place within an environment and the environment is where all tourism resources are found. The environment is often referred to as the key component of tourism because it is the bedrock of tourism development (Holden, 2008,in Enemuo, 2012).The attributes of an environment can be viewed as natural and/ or cultural (Enemuo et al,2012). Tourism development takes place where the natural/cultural environments are attractive and desirable (Enemuo, 2012).

Tourism resources may be refers to as natural or cultural (in the formal sense) goods and has the capacity to inspire visitors (in the functional sense) (Navarro 2015). According to (Navarro, 2015)) tourism resources can be classified according to origin (natural, cultural, or human) materiality (tangible and intangible) and moveable or unmovable. Tourism resources are those things which are necessary for tourism to take place, they are the attraction and the driving force of tourism.

Sustainability can be defined as how natural system functions, remains diverse and produce everything its needs for the ecology to remain in balance (Mason 2016). Mason further explains that sustainability acknowledges that human civilization takes resources to sustain our modern way of life. According to him, Sustainability entails reducing carbon emission, protecting the environments, and keeping the delicate ecosystem of our planet in balance, sustainability looks to protect our natural environment, human and ecological health while driving innovation and not compromising our way of life.

Owing to the fact that the world will continue to use energy to carry out its various activities, It is important to look at how the use of energy will affect the resources which are necessary for tourism and to suggest ways in which the use of energy can be control to achieve an environment fit for tourism and to allow tourism to be sustained.

It is important to look at the problems and specific issues related to tourism and energy consumption. Therefore, the essence of this work is to show the cause and effects relationship between tourism and energy consumption and its impacts on economic development this is done through an analysis of indicators such as electric power consumption. Since an increase in tourism activity comes with an increase demand for energy within various functions, the importance of energy for the tourism sector is undeniable.

METHODOLOGY

Objectives of the Study

The main objective of the study was to examine the implications of energy use in the sustainability of tourism resources in Uyo, Akwa Ibom State. Specifically the work

- Identified the various sources of energy use in Uyo, Akwa Ibom state
- Ascertained the influence of energy used on the tourism destinations in Uyo, Akwa Ibom State
- Suggested ways of sustaining tourism destination in Uyo, Akwa Ibom State through the use of renewable energy sources.

RESEARCH QUESTIONS

- What are the various sources of energy use in Uyo, Akwa Ibom State?
- What are the influences of energy on the tourism destinations in Uyo, Akwa Ibom State?
- What are the ways in which tourism destinations in Uyo, Akwa Ibom can be sustained through renewable energy sources?

RESEARCH HYPOTHESIS

H1: There is a significant relationship between energy use and tourism resources

PRESENTATION OF DATA AND DISCUSSION OF FINDINGS

Data Presentation

Research question one

What are the sources of energy used in Uyo, Akwa Ibom State?

Table1. *Mean response of sources of energy used in Uyo, Akwa Ibom*

S/N	Sources of energy used in uyo, Akwa Ibom state	Total	Mean	SD	Remark
1	Uyo, Akwa Ibom uses non- renewable sources of energy	446	2.97	1.0	Agreed
2	Uyo, Akwa Ibom State uses renewable sources of energy	404	2.69	0.90	Agreed
Sources of Non Renewable Energy Used In Uyo, Akwa Ibom State					
3	Fossil fuel: Gas	535	3.57	0.50	Agreed
4	Fossil fuel: petrol	570	3.80	0.59	Agreed
5	Fossil fuel: kerosene	515	3.43	0.55	Agreed
6	Fossil fuel: Diesel	576	3.84	0.60	Agreed
7	Fossil fuel; lignite	336	2.24	0.60	Disagreed
Sources of Renewable Energy Used In Uyo, Akwa Ibom State					
8	Wood	478	3.18	1.02	Agreed
9	Cattle dung	278	1.85	0.59	Disagreed
10	Wind	256	1.71	0.71	Disagreed
11	Solar	460	3.16	0.64	Agreed
12	Hydroelectric	358	2.39	0.66	Disagreed
13	Hydrogen and fuel cells	244	1.63	0.18	Disagreed
14	Geothermal	260	1.73	0.08	Disagreed
TOTAL		**5,716**	**38.19**	**8.71**	
Clustered Mean 2.74					

Source: *field survey, 2017*

Table 1 above, showed the mean responses on sources of energy used in Uyo, Akwa Ibom State. The first segment of the table showed the mean responses on classification of energy used in Uyo, Akwa Ibom State. Respondents agreed that non renewable and renewable energy are used with their mean responses of 2.97 and 2.69 respectively

The second segment of the table showed the mean responses on the various sources of non-renewable energy used in Uyo, Akwa Ibom State .Respondents agreed that fossil fuels are used with their respective mean responses as follows; gas 3.57, Petrol 3.80, kerosene 3.43, diesel 3.84, but disagreed to lignite 2.24

The third segment of the table 1 showed the mean responses on renewable sources of energy used in Uyo, Akwa Ibom State. Majority of the respondents agreed that wood-fuels and solar are used, with respective mean responses of 3.18, 3.06. Respondents disagreed to cattle dung, wind, Hydroelectric, Hydrogen and fuel cells, geothermal with mean response of 1.85, 1.73, 2.69, 1.60, and 1.73 respectively. This indicated that the major classes of energy used in Uyo, Akwa Ibom State are non- renewable and from various sources mostly fossil fuels, from the decision rule any mean response from 2.5 and above should be regarded as positive and below should be regarded as negative.

Research Question Two

What are the influences of energy used on tourism destination in Uyo, Akwa Ibom State?

Table2. *Showing the influences of energy used on tourism destination*

S/N	Influences of energy used on tourism destination in Akwa Ibom State	Total	Mean	SD	Remark
	Natural Environment				
1	The use of energy leads to degradation of natural environment due to gases emission.	508	3.69	0.80	Agreed
2	The use of biomass (wood fuel) Leads to deforestation and destruction of the habitants of most animals.	508	3.39	0.80	Agreed
3	Noise pollution produced by energy Sources, disturbs animals and alters their behavioural pattern.	390	2.60	1.76	Agreed
4	Climate change as a result of energy use alters the weather and affect tourist flow to the destination	368	2.45	1.10	Disagreed
5	Wind power cause hazard to birds and bates by trapping them thereby destroying birds that are attractions	340	2.26	0.64	Disagreed
	Social Environment				
6	Sitting renewable energy resources solar panel and wind turbine brings aesthetic complaint	361	2.14	1.13	Disagreed
7	Maintenance of non-renewable energy resources creates waste like oils, lubricants, scrape parts which can affects destination cleanliness	365	2.43	1.12	Disagreed
8	Emission from energy resources like generator destroys ornamental plants in tourism destination	576	3.88	0.68	Agreed
9	Noise pollution from energy resource makes tourist and workers aggressive when communicating	570	3.80	0.32	Agreed
10	Energy used leads to carbon emission which may affects the health of people in the destination	596	3.98	0.22	Agreed
	Cultural Environment				
11	Climate change due to energy used alters the weather leading to a cooler or hotter temperature thereby affecting the cultural dressing in the destination	392	3.61	0.45	Agreed
12	climate change due to energy use alters seasonality in the availability of cultural food therefore affecting food festivals and cultural events	546	3.64	1.75	Agreed
	TOTAL	**5,916**	**33.53**	**10.77**	
	SD = standard deviation; Clustered Mean=3.32				

Source: *field survey, 2017*

Table 2 showed the mean responses on influences of energy used on to destination in Uyo, Akwa Ibom State. The first segment of the table is on natural environment. Most respondent agreed that the use of energy leads to the degradation of natural environment due to gases emission, The use of biomass (wood fuel) Leads to deforestation and destruction of the habitants of most animal, Noise pollution produced by energy Sources, disturbs animals and alters their behavioural pattern with mean of 3.69, 3.39 and 3.60 respectively, while most respondent disagreed to the questions that Climate change as a result of energy use alters the weather and affect tourist flow to the destination ,wind power cause hazard to bird and bates by trapping them thereby destroying birds that are attractions with mean response 2.60,2.26 respectively.

The second segment showed the mean response on social environment the tables shows that most of the respondent agreed that emission from energy resources like generator destroys ornamental plants in tourism destination, noise pollution from energy resource makes tourist and workers aggressive when communicating, energy used leads to carbon emission which may affects the health of people in the destination with respective mean response of 3.88, 3.80,3.98. the table showed that most respondent disagreed that sitting renewable energy resources like Solar panel and wind turbine bring aesthetic complaint, maintenance of non-renewable energy resources creates waste like oils, lubricants, scrape parts which can affects destination cleanliness with mean response of 2.14 and 2.43 respectively.

The third segment showed the mean responses on cultural environment. Respondents agreed that climate change due to energy alters seasonality in the availability of cultural food therefore

affecting food festivals and cultural events, Climate change due to energy used alters the weather leading to a cooler or hotter temperature thereby affecting the cultural dressing in the destination with mean response of 3.61, 3.64 respectively

Research Question Three

What are the ways in which tourism destination in Uyo, Akwa Ibom state can be sustained through the use renewable energy sources.

Table3. *Mean response on how tourism destination can be sustained*

S/N	ways in which tourism destination in Uyo Akwa Ibom State can be sustained	Total	Mean	SD	Remark
1	. Tourism Destination in Uyo, Akwa Ibom State can be sustained by green tourism	547	3.64	0.69	Agreed
2	Tourism destination can be sustained through The use of wind and solar since they are the most abundant energy sources	529	3.53	0.53	Agreed
3	The use of renewable energy will reduce cost of operation for tourism destination	496	3.31	3.90	Agreed
4	Use of renewable energy will help sustained tourism destination and lead to increase arrivals since they emit less carbon and are less detrimental to health	536	3.57	0.60	Agreed
5	Tourism destination in Uyo, Akwa Ibom will have competitive advantage, generate more economic benefits which will help in maintenance and sustainability	463	3.09	0.70	Agreed
Total		**2,571**	**17.33**	**6.42**	
SD = standard deviation; Clustered Mean=3.43					

Source: *field survey 2017*

Table 3 above, showed the mean responses on ways in which tourism destination in Uyo, Akwa Ibom state can be sustained through the use of renewable energy sources. Most respondent agreed that tourism destination in Uyo, Akwa Ibom State can be sustained by green tourism, tourism destination can be sustained through the use of wind and solar since they are the most abundant energy sources, the use of renewable energy will reduce cost of operation for tourism destination, use of renewable energy will help sustained tourism destination and lead to increase arrival since they emit less carbon and are less detrimental to health, tourism destination in Uyo, Akwa Ibom will have competitive advantage, generate more economic benefits which will help in maintenance and sustainability with respective mean response of 3.64, 3.53, 3.31, 3.57, 3.09.

Hypothesis Testing

The hypothesis started below will be statistically tested. It is formulated under alternate hypothesis (Ha), the hypothesis will be subjected to chi square statistical test.

The chi square (x^2) statistical test is given by

$$X^2=\sum \frac{(of-ef)^2}{Ef}$$

Where, Fo= Expected frequency; Fe= Observe frequency; X^2 = Chi-square; $\sum$ = Summation of values

Statement of the Decision Rule

($X^2_{cal} > X^2_{tab}$) Accept the Alternate hypothesis (Ha) and reject the Null hypothesis (Ho)

(Ha_1): There is a significance relationship between energy used and tourism resources

Table4. *chi square contingency table of selected questions from research questions 2*

	SA	A	SD	D	TOTAL
Q1	$\frac{(104-122.5)^2}{122.5} = 2.80$	$\frac{(46-26.25)^2}{26.25} = 14.86$	-	-	150
Q8	$\frac{(142-122.5)^2}{122.5} = 3.10$	$\frac{(3-26.25)^2}{26.25} = 20.59$	-	$\frac{(5-1.25)^2}{1.25} = 11.25$	150
Q10	$\frac{148-122.5)^2}{122.5} = 5.31$	$\frac{(2-26.25)^2}{26.25} = 22.40$	-	-	150
Q12	$\frac{(96-122.5)^2}{122.5} = 5.73$	$\frac{(54-26.25)^2}{26.25} = 29.34$	-	-	150
TOTAL	490	105	-	5	600

Source: *Field survey 2017*

Table 4 above showed the test of hypothesis, questions 1, 8, 10, 12 were selected from research question 2 to test the hypothesis.

(Expected count are printed beside observed count)

Expected Count= $\frac{\text{Row total} \times \text{Column total}}{\text{Grand Total}}$

Table4.5. *Computation of Chi Sqaure Statisitc*

Response	Fo	Fe	Fo-fe	$(fo-fe)^2$	$(fo-fe)^2/fe$
SA	104	122.5	-18.5	342.25	2.82
A	46	26.25	19.75	390.06	14.85
SD	0	0	0	0	0
D	0	1.25	-1.25	1.56	1.25
SA	142	122.5	19.5	380.25	3.104
A	3	26.25	-23.25	540.56	20.59
SD	0	0	0	0	0
D	5	1.25	3.75	14.06	11.25
SA	148	122.5	25.5	650.25	5.31
A	2	26.25	-24.25	588.06	22.40
SD	0	0	0	0	0
D	0	1.25	-1.25	1.56	1.25
SA	96	122.5	-26.5	702.25	5.73
A	54	26.25	27.75	770.06	29.33
SD	0	0	0	0	0
D	0	1.25	-1.25	1.56	1.25
TOTAL			**104.45**		

X^2 calculated value = 104.45

Degree of freedom =9

X^2 (r-1) (c-1) level of significance = 5% = 0.05

The degree of freedom DF= number of row (r-) × (c-1)

Where

R= number of rows

C= number of columns

Degree of freedom (Df) = (r-1) (c-1) = (4-1) (4-1) = 3×3 =9

When DF is 9 then X^2 table value at 5% level of significance is 6.635

Decision Rule

If the x calculated is great than the x tabulated ($x^2 > x^2$) reject the Null hypothesis and accept the alternate hypothesis.

Table 4.5 above showed that x^2 calculated value was 104.45 while X tabulated was 6.635. Since x^2 tabulated value was greater than x^2 calculated(x^2 tab 104.45> x^2cal 6.634) accept the alternate hypothesis

(Ha) Hypothesis was accepted implying that there is a significance relationship between energy use and tourism resources.

Major Findings

The findings of the research on the implication of energy use in the sustainability of tourism resources in Uyo, Akwa Ibom indicated the two classification of energy are used in Uyo, Akwa Ibom State which are non- renewable and renewable. The study showed that the non-renewable sources are commonly used in Uyo Akwa Ibom. It was discovered that the non-renewable sources used are; Gas, Petrol, Kerosene and Diesel. It was also revealed that some renewable sources of energy are used in Uyo, Akwa Ibom, these are Wood and Solar.

Findings also showed that energy used influences tourism destinations in Uyo, Akwa Ibom State, and these influences are on natural, cultural and social environment. This is indicated in respondents positive reaction to the questions that the use of energy leads to degradation of natural environment due to gases emission, the use of biomass (wood fuel) Leads to deforestation and destruction of the habitants of most animals, noise pollution produced by energy Sources, disturbs animals and alters their behavioral pattern, emission from energy resources like generator destroys ornamental plants in tourism destination, noise pollution from energy resource makes tourist and workers aggressive when communicating, energy used leads to carbon emission which may affects the health of people in the destination, climate change due to energy used alters the weather leading to a cooler or hotter temperature thereby affecting the cultural dressing in the destination, climate change due to energy use alters seasonality

in the availability of cultural food therefore affecting food festivals and cultural events .

Findings of the research showed that respondents agreed that tourism destination can be sustained through the use of renewable energy sources by responding positively to the following questions Tourism Destination in Uyo, Akwa Ibom state can be sustained by green tourism, tourism destination can be sustained through the use of wind and solar since they are the most abundant energy sources, the use of renewable energy will reduce cost of operation for tourism destination, Use of renewable energy will help sustained tourism destination and lead to increase arrivals since they emit less carbon and are less detrimental to health, tourism destination in Uyo, Akwa Ibom will have competitive advantage, generate more economic benefits which will help in maintenance and sustainability.

Findings showed that the alternate hypothesis was accepted since the x2 calculated value was 104.45 while X tabulated was 6.635, in accordance with the decision rule. This indicated that there is a significant relationship between energy used and tourism resources.

Discussion of Findings

The Findings from research question one, showed that the classes of energy used in Uyo, Akwa Ibom State are non- renewable and Renewable. The findings also revealed that the most widely used of this classes are the non-renewable which are fossil fuels like Gas, Petrol, Kerosene and Diesel. From the findings it was deduced that some renewable sources of energy are used which are Solar and wood fuels. This goes in line with (National Research Council, 2008) which studied the sources of energy used in the United States and concluded that 81% of its total energy are fossil fuel (nonrenewable) and 10% from the renewable sources.

Findings from research question two showed the influence of energy used on tourism destination in Uyo, Akwa Ibom State. The influences were showed on natural, social and cultural environment.

It was deduced that the use of energy leads to degradation of natural environment due to gases emission, the use of biomass (wood fuel) leads to deforestation and destruction of the habitants of most animals, noise pollution produced by energy Sources disturbs animals and alters their behavioural pattern, emission from energy resources like generator destroys ornamental plants in tourism destination, noise pollution from energy resource makes tourist and workers aggressive when communicating, energy used leads to carbon emission which may affects the health of people in the destination, Climate change due to energy used alters the weather leading to a cooler or hotter temperature thereby affecting the cultural dressing in the destination, climate change due to energy use alters seasonality in the availability of cultural food therefore affecting cultural events and food festivals. This indicated that the various sources of energy used in Uyo, Akwa Ibom State influences tourism resources. This is in-line with (Marunda, 2013) that stated that large amount of greenhouse gases emission are produced from the use of non-renewable energy sources, such as oil, natural gas and coal. The findings revealed was also in line with (Luigi and Peter, 2009) which stated that if energy is produced by the use of conventional non- renewable sources, this has a significant impacts, this impacts has a negative influence on the environment. It was revealed from the findings that the non-renewable sources of energy used in Uyo, Akwa Ibom State has negative influences on tourism destination.

Findings from research question three showed suggestions on ways to sustained tourism destination in Uyo, Akwa Ibom State through the use of renewable energy sources. It was revealed that tourism Destination in Uyo, Akwa Ibom State can be sustained by green tourism, this is in accordance with (Jürgen, 2010) which looks at green tourism as a strategy for environmental consciousness for destination to remain attractive and competitive. Findings also revealed that tourism destination can be sustained through the use of wind and solar since they are the most abundant energy sources, the use of renewable energy will reduce cost of operation for tourism destination ,use of renewable energy will help sustained tourism destination and lead to increase arrivals since they emit less carbon and are less detrimental to health, tourism destination will have competitive advantage, generate more economic benefits which will help in maintenance and sustainability this is in line in (Holden, 2000, in Marunda et al, 2013) which stated that the use of renewable energy is the answer to sustainable tourism as this source as very low release of carbon dioxide, renewable sources has lower carbon emission therefore they are considered has green and environmentally friendly.

Findings from the test of hypothesis showed that there is a significant relationship between

energy used and tourism resources. From the findings it was revealed that the x2 calculated was greater than x2 tabulated at (x2 104.45> 6.634). Therefore the alternate hypothesis was accepted in accordance with the decision rule. This indicated that there is a relationship between energy and tourism resources which is in line with (department of industry, tourism and resources, 2013) which investigated and concluded that the energy is necessary for tourism activities and that energy use has impacts on tourism resources.

CONCLUSION

Sources of energy used in Uyo, Akwa Ibom State are mostly fossil fuels which has negative implications on tourism resources. The literature and examples drawn upon in this research work shows the relationship between energy used and tourism resources. Through a decrease in the use of the non-renewable energy sources which are detrimental on the natural, social and cultural aspect of human life, tourism resource in Uyo, Akwa Ibom State will be more sustained. It is important however to note that the use of energy cannot be totally avoided since energy is the driving force of industrialization and is needed to carry out a lot of activities for the sake of humanity but individual should be more environmentally friendly and energy efficient

RECOMMENDATIONS

In line with conclusion reached by this study, the following recommendations are suggested to ensure that tourism resources in Uyo, AKS are sustained

- Government should enact laws and principles and strongly enforce existing principles such as the polluter pay principles to ensure that individual, industries and companies takes responsibility for high degree of pollution caused by them due to energy used , this will make people more environmentally friendly.
- It is important to improve the carbon foot – print with respect to transportation. Carbon foot- print can be achieve by the following ;

  Fuel economy: electric vehicle, biodiesel cars can be used to help reduced the amount of carbon emission

  Reduce driving: people should consider ways to reduce driving. Public transportation is greener that using a private car. It is recommended that if and when walking and cycling are possible they are better options to the used of cars or motorbike, this will reduce carbon foot- print and also improve health. By reducing the amount of energy used for transportation, there will be lower carbon emission.
- Individuals, household, the hospitality and tourism industry as well as other industries, event's organizers etc. should be more energy efficient. This implies delivering the same (or more) services why using less energy. Developing energy efficient lifestyles are the first step in reducing the environmental impact that human has on earth. in other to be energy efficient the following can be done;

  Plant a tree: trees absorb a ton of carbon over its life time, it is therefore recommended that greening the environment will help protect tourism destination by reducing carbon emission

  Buy local food: the energy used to transport food from all over the world is extremely high. By buying locally its does not only help the economy but also saves fuel.

  Use a led bulb: led bulbs (light emitting diode) should be use since it is one of todays most efficient and energy efficient.

  Burning should be reduce, most of the things burnt like paper, waterproof etc can be recycle, the government has a role to play in establishing a recycling company.

  Car tires should be inflated: cars should be checked to ensure there are inflated, driving with inflated tires reduces gas mileage by up to 3%, this is because it helps get to your destination faster. Every gallon of gasoline saved keeps 20 pounds of carbon dioxide out of the atmosphere.

  Turn off light and electrical appliances
- There should be a switch to cleaner energy resources, cleaner energy are renewable energy which have less carbon emission.

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