

Utilization of Green Energy Innovations among Recreation and Tourism Service Providers in Nigeria: Implications for Public Health Education

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Abstract: Nigeria is indifferent regarding embracing green energy innovations. The few green energy innovations that are available seem not to be utilized especially among recreation and tourism service providers. This study determined level of utilization and barriers to utilization of green energy innovations among recreation and tourism service providers in Nigeria. Cross-sectional research design was used. The multi-stage sampling procedure was employed to select 394 respondents out of 5,392 recreation service providers. Pretested and validated researchers' structured questionnaire (R=.87) was used for data collection. Frequencies and percentages were used to answer the research questions while logistic regression was used to test the null hypothesis at 0.05 alpha level. The findings of the study revealed that cost of green energy, government policies, technical maturity, environmental sustainability, ignorance, lack of green energy related skills and technical know-how among others were the reported barriers to green energy innovations in Enugu State. The study concluded that barriers that affect the utilization of green energy innovations abound, but can be mitigated. Based on these findings, the study recommended that green energy innovations should be made available through government policies/interventions in order to reduce the use of fossil fuels while embracing green energy innovations as alternatives.

Keywords: Green Energy, Innovations, Barriers, Utilization, Recreation and Tourism, Public Health Education

1. Introduction

Poor access to electricity has vastly affected development of Africa as a continent. Reports show that 935 million (85%) of people in the world today that are without access to electricity live in Africa [1]. Paris Climate Agreement raised concerns on the need to adopt green energy as a strategy to salvage the debilitating ecosystem and biomass. More than 2.8 billion people without electricity do not have access to clean forms of energy for cooking [1]. Green technologies have been receiving much attention globally for the past three decades, driven mainly by ever increasing demands for more efficient and sustainable uses of resources. These demands call for the inevitability to develop technological innovations and responsible practices that are more environmentally friendly, to address barriers and challenges arising from the over-exploitation of resources and environment [2]. The 21st Century development pathway is facing a challenge between climate change mitigation, sustained economic prosperity and energy security [3].

Many developing countries, Nigeria inclusive are indifferent regarding embracing green energy innovations. A report of energy transition ranking of African countries in 2021 by global position left Nigeria missing in the top ten African countries in the energy conservation [4]. Empirical evidences show that there are ample green energies available to be harnessed, but only negligible proportions are being utilized [1,5]. It gives more concern when recreational and tourist facilities fail to adopt the available green energy innovations to further lessen the effect of bad fossils on our already deteriorating climate. Tourists and people seeking relaxation and recreation seem to find themselves in polluted environments stemming from smoke, carbon emissions, noise from generators, among others. Enugu State is widely acclaimed to be a relaxation spot in Nigeria due to its serene climate and ambience from green highlands. More so, Enugu State is a viable state where all forms of innovations take effect.

Green energy innovations have been stirring interest in both commercial and household constructions. Researchers have continued to demonstrate possibilities of clean energy through innovations on green energy. Though green energy innovations have been certified as clean energy and ecologically friendly, disparities in the utilization of the innovations still exist among the developed countries and developing countries [6,7]. Utilization of currently available technology and only those sites where energy facilities are socially, economically and politically acceptable is pertinent [8]. The authors further affirmed that there is more than enough power from the sun, wind, geothermal, biomass, and other sources to meet all our present energy needs. Studies have shown that

increasing trend in ecological innovation is a good sign towards lowering the carbon emissions in the natural environment [9,10]. One of the easiest ways to avoid energy shortages and to relieve environmental and health effects of our current energy technologies is simply to use less of unclean energies. Actions that promote sustainable growth and development across all phases of the human environment are critical to the continued existence of the planet [5]. Therefore, it is imperative to make available the green energy innovations for use as alternatives to non-renewable energy sources. Empirical evidences show that achieving green growth is possible through green energy innovation amidst impacts of climate change and other barriers [3]. Social norms, moral obligations to high willingness to pay for green energy have been identified as barriers to utilization of green energy innovations [11].

Green energy is among the clean energy sources that cover biomass, hydropower, solar, wind, geothermal, and wind energy. It is believed that green energy is the key source of a cleaner and sustainable energy for the coming time [12]. Green energy has become an important objective especially for fighting climate change and improving energy security [11]. A study concluded that economic complexity, renewable energy, and energy innovation effectively mitigate environmental degradation [13]. At the same time, financial development and urbanization have an adverse impact on the environment.

2. Implications to Public Health

Clean energy is tantamount to improved quality of life. Living in a cleaner environment positively affects people's health [14]. High energy consumption is a major cause of environmental pollution [15]. Provision of the needed energy from natural resources as against fossil fuels promotes clean energy. Reduction in the amount of carbon emissions helps to decrease air pollution [15]. These findings have extensive policy implications for policymakers and environmental stakeholders, who are aiming to achieve sustainable energy, policy and economic growth to meet the environmental commitments under Paris Climate Agreement. Achievement of Goal 7 has been established as the golden link to successful implementation of all other sustainable development goals [5]. Specifically, the study found out the level of utilization of green energy innovations among recreation and tourism service providers and barriers to the utilization of green energy innovations among recreation and tourism service providers in Nigeria.

3. Methodology

3.1. Design of the study

The cross-sectional research design was used in the study.

3.2. Area of the study:

The study was carried out in Enugu State. Enugu State is made up of three senatorial districts and 17 Local Government Areas (LGAs). It has interstate boundaries with Kogi and Benue States to the North, Abia State to the South, Anambra State to the West and Ebonyi State to the East. Majority of recreation and tourism service in Nigeria are educated. A good number of them are public servants, others engage in trading, farming and other businesses, while some are into recreation full time.

3.3. Population for the study

The population for the study comprised of all registered recreation and relaxation spots, parks and hotels with relaxation or recreational facilities in Enugu State at the time of this study (February, 2022) estimated at 5392.

3.4. Sample for the study

The sample size was 400 recreation and tourism service providers in Enugu State. This is in line with the guideline that when a population size is 5,000 and above at 95% confidence level (5% interval), the sample size should be 357 and above [16].

3.5. Sampling procedure

The multistage sampling procedure was used to draw the sample size. The first stage involved clustering the facilities in Enugu State into recreation and relaxation spots, parks and hotels. Ratio was used to represent each cluster and simple random sampling was employed to draw the respondents.

3.6. Instrument for data collection

Questionnaire served as instrument for data collection. Face validity of the instrument was established by five experts; three from the Department of Human Kinetics and Health Education, one from Energy Centre and one from Science Education (Measurement and Evaluation Unit), all in University of Nigeria, Nsukka. The internal consistency of the instrument was determined using spearman rank order statistics and a reliability co-efficient of .87 was obtained. The index was high enough and therefore considered reliable for use for the study. This is in line with the guidelines [17] that if the reliability coefficient obtained is 0.72 and above, the instrument should be considered reliable for the study.

3.7. Method of data collection

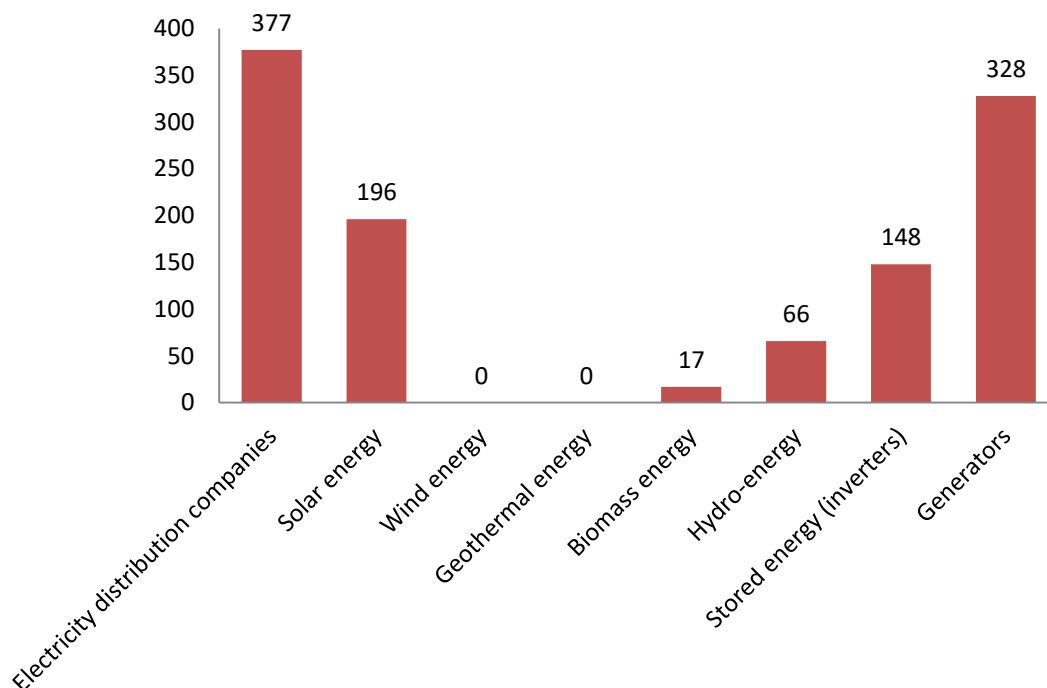
Data for this study were collected by the researchers at the spot. Only those who gave consent and declared their interest were used. Data collected were cross-checked for completeness. Logical techniques were employed to identify errors during data cleaning. Out of 400 copies of questionnaire only 394 copies of questionnaire were duly filled and were used for data analysis.

3.8. `

The Statistical Package for the Social Sciences (SPSS) version 23.0 was employed for statistical analysis. Frequencies and percentages were used to determine the sources and barriers of green energy innovations among recreation and tourism service providers in Nigeria. Chi-Square was used to test the null hypothesis at .05 level of significance.

4. Results

Figure 1. Sources of Energy utilized by Recreation and Tourism Service Providers



As is indicated in Figure 1, almost all the facilities subscribe to the electricity distribution companies (95.2%). Alternative sources of energy at the hotels and recreation centers are generators (83.2%), solar energy (49.7%), and inverters (37.6%).

Table 1. Barriers to Green Energy Innovations among Recreation and Tourism Service Providers in Nigeria (n=394).

S/n	Barriers to Utilization of Green Energy Innovations	f	%	Test Statistics ^a	
				χ^2 value	pvalue
1.	Cost of green energy	331	84.0	9.130	.003
2.	Government policies on green energies	218	55.3	2.420	.120
3.	Technical maturity to advance green energy innovations	215	54.6	4.624	.032
4.	Environmental sustainability of green energy innovations	149	37.8	1.207	.272
5.	Ignorance of masses regarding green energy innovations	166	42.1	.022	.881
6.	Lack of green energy related skills and technical know-how	277	70.3	2.296	.130
7.	Are you aware of green energy innovations?	198	50.3	1.491	.222
8.	Are you willing to adopt them as against fossils and non-renewable energies?	313	79.4	.003	.957
9.	Have you heard about climate change and its effects to ecosystem?	169	42.9	7.901	.005
10.	Do you feel green energy innovations can impact climate positively?	277	70.3	.089	.766

^a The test statistics are based on the types of facilities (Parks and resorts, Hotels, Restaurants)

Almost all the facilities subscribe to the electricity distribution companies (95.2%). Alternative sources of energy at the hotels and recreation centers are generators (83.2%), solar energy (49.7%), and inverters (37.6%). Majority of the items are reported as barriers to green energy innovations. Notable among them are cost (84%), lack of skills and technical know-how (70.3%), government policies (55.3%) and technical maturity (54.6%). Knowledge is a barrier as only half (50.3%) are aware of green energy innovations. However, 79.4 per cent are willing to adopt green energy innovations whereas 70.3 per cent strongly believe on its positive impact to the climate.

5. Discussion

Increase in national population, urbanization, rise in industrial activities and energy driven technologies among other factors have given rise to high energy demand in our homes and industries. This has led to high patronage of alternative sources of energy, which are not environmentally friendly. The findings showed that no green energy alternative was utilized up to 50% where as generators were used by more than four-fifth of the respondents. This is worrisome and lends credit to existence of some bottle necks to the attainment of SDG goal number 7. Fossil fuel can no longer meet the energy requirements due to their scarcity and rising cost [6]. Government policies were reported by majority as a barrier to utilization of green energy innovations. This is in consonance with the reports that policy making is potent enough to put things right and lure investors into green energy innovations which has many positive sides ecologically [18]. Research and development, lowering of electricity price were major drivers for biomass and other renewable in China and could be considered here in Nigeria [18].

Wind energy is non-existence and therefore not utilized. This is ridiculous owing to the available wind powers from the Sahara and northeast trade winds. The government of the day seems to be approaching green energy innovations with kid gloves. This finding was envisaged because Nigeria is facing many security challenges. Notwithstanding, this finding is at variance with the report that development of wind energy has garnered renewed interest from federal government of Nigeria [19]. Researches in different countries established a robust correlation between sustainable energy production, socio-economic prosperity and environmental security from places around the world [20,21]. The economic growth and social development of any nation depend remarkably on the sufficiency of its energy sector. Suffice it to say that the realization of the sustainable development goals by 2030 in Nigeria and the entire sub-Sahara African region depends heavily on energy. Good health and well-being, which is United Nations Sustainable Development Goals (SDGs) 4, and Climate Action, which is SDG 13, can be greatly advanced in Nigeria when the issue of green energy innovations and its impact on human health is given serious consideration [22]. The education sector can build knowledge and skills for adaptation, mitigation, and for articulating appropriate policy responses to address the transition to a fully decarbonized economy [23]. More so, the education sector can impart solutions for collective action around innovation, including the scaling up of investments in all forms of capital [23].

6. Recommendations

The following recommendations were made based on the findings.

1. Green energy innovations should be made available through government policies/interventions in order to reduce the use of fossil fuels while embracing green energy innovations as alternatives.
2. Research on multidisciplinary areas is recommended, and we strongly believe these are beneficial in achieving a better environment.
3. It is necessary to establish a supportive environment which must include a maintenance plan, preferably involving members of the community.

7. References

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