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Understanding the Perception of Sustainable Development in Developed and Underdeveloped Countries

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Abstract

The study focuses on the perception of individuals in developed and underdeveloped countries on the concept of sustainable development. The study uses UK and Nigeria to represent developed and underdeveloped countries respectively. A survey was administered to give insight to the perception of individuals in both countries. The study relies on descriptive analysis and data visualization techniques to understand the perception of individuals in both countries.

Keywords*: *Nigeria, Perception, Sustainable development, United Kingdom

INTRODUCTION

Climate change, environmental degradation, energy resource depletion and energy security are issues that affect everybody at one level or the other. Sustainable development is a global issue and should not be treated as only a regional issue, because ultimately all actions and inactions towards achieving sustainable development goals, would determine if future generations would be able to meet their needs. Therefore identifying possible gaps that might exist between both societies as regards the subject matter of sustainability development, a platform is being set to create improvement where necessary so that global goals can be achieved without putting strain on one particular economy. By understanding the perspective of both societies to sustainability development, we can evaluate its progress especially pertaining to the role of behavioural change and identify opportunities for improvement. This study uses Nigeria as a representation of underdeveloped countries and the United Kingdom as a representation of developed countries. Perception is primarily about the way individuals perceive objects. Individual's perception may be an inclination to how they might behave towards a certain object. Therefore understanding individual's perception towards Sustainable development might give insight into how they tackle important issues such as climate change, environmental degradation, energy resource depletion and energy security.

OBJECTIVE

The objective of this study is to highlight how individuals in developed and underdeveloped countries perceive Sustainable development. The study goes further to identify differences in the perception of sustainable development in developed and underdeveloped countries.

METHODOLOGY

The study uses the UK and Nigeria as representations of developed and underdeveloped countries. The study relies on primary data; therefore a survey was administered to participants in the UK and Nigeria. A total of 82 individuals participated in the survey. The study is partly qualitative and quantitative and relies significantly on descriptive statistic techniques. The study also makes use of data visualization techniques to further give insight.

Background of Sustainable Development in the United Kingdom and Nigeria

The United Kingdom has a total population of about 63 million and in 2008 was estimated to have used over

230 million tonnes of oil equivalent worth of energy in that same year. The UK is blessed with several resources that can be used for the generation of energy such as coal, wind, waves, natural gas and sunlight. As part of the method designed to combat climate change and improve sustainable development, the European Union set targets for reducing greenhouse gas emissions (GHG) by 20% in 2020. In line with these obligations the UK has also set targets of reducing GHG emissions by 80% in 2050. The implication of this is that the UK has to cut down on energy generation from fossil fuels such as coal, and increase generation from renewable sources such as wind as well as reduce demand for energy via behavioural change. This has led the UK to set a target of increasing its renewables in its energy generation mix by 15% by 2020 in line with the EU's target of increasing the renewables by 20% in 2020 [1]. The UK has not always been environmentally conscious because before the 1950's most generation capacity was from coal. However the use of coal decreased for several reasons such as the deregulation of the energy sector forcing there to be an increase in competition. This encouraged the use of cheap natural gas from the North Sea, such that by 2004 over 30% of generation capacity was from natural gas. In the bid to achieve sustainable development the UK currently operates over 300 wind farms consisting of over 3,500 wind turbines generating a capacity of about 6,580 megawatts. However wind energy still comes second to energy retrieved from biomass even though the UK is ranked as the 8th largest wind producer in the world. The UK used to be almost self-sufficient in natural gas; however it now imports nearly 40% from countries such as Russia [1].

Nigeria has a population estimated to be over 140 million and is endowed with several energy resources such as crude oil, coal and uranium.[2] In 2005 Nigeria was ranked as the 10th largest producer of oil and gas in the world and the 5th largest crude oil exporter in 2009.[2] Nigeria's oil reserves is estimated to be over 30 billion barrels and gas reserves between 4 trillion and 5 trillion cubic metres.[2] Nigeria's major source of electricity generation is from hydroelectricity, oil, coal and gas fired power plants, while other forms of energy generation such as biomass and solar are almost insignificant. Nigeria's electricity generation is being run by the Power holding company of Nigeria (PHCN) which is a government owned organization. The energy sector is being regulated by the Energy Commission of Nigeria and is mandated to take responsibility of all strategic planning and coordination of all energy policies in Nigeria.[3] Nigeria's road to sustainable development in the energy sector has not been positive because there are still several occurrences of power outages, insufficient renewable energy infrastructure, use of personal generators which increase carbon emissions, insufficient transportation infrastructures amongst several others. However, because of the inability to reach several rural areas with energy, several state governments are using the sustainable development approach to reach such communities by installing renewable technologies such as solar powered lamps and biomass.

Analysis on the Perception of Sustainable Development in Nigeria and the UK

The perception of sustainability in both countries was independently observed to give insight into each country's situation as well as a joint analysis was conducted in order to identify the differences in sustainable development.

Perception of Sustainable Development in the UK

The distribution between male and female respondents in the UK was almost even with values of 51.4% and 48.8% respectively, with majority of them falling into the age group of 26-35 (29.7%) years and above 50 (27%) while others fell into the age group of 15 – 25 years (24.3%) and 36 – 50 years (18.9%). 39% responded as staff while others fell into the occupation categories of student, parent, business owner and retired with values of 34.1%, 12.2%, 7.3% and 7.3% respectively. Under the section for the type of accommodation, majority of the respondents fell under the category of personal (owner) having a value of 48.6%, while others fell in the other categories of rented and living with family/friends with values of 32.4% and 16.2% respectively.

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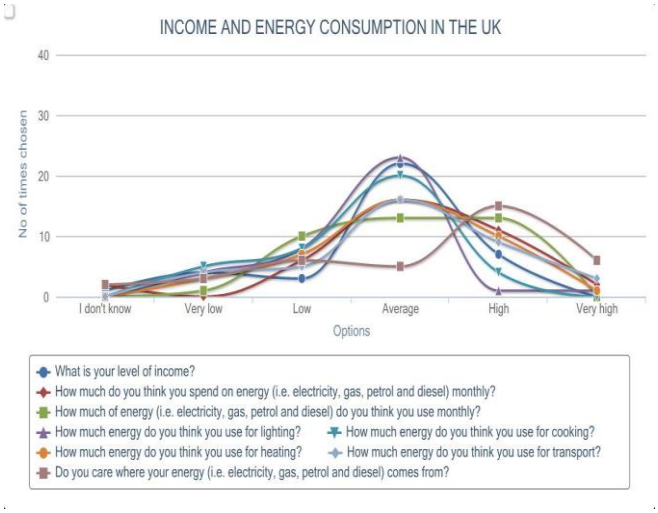

Figure 1: Income, energy consumption and expenditure in the UK

Fig.1 is a representation of the level of incomes of respondents and their total level of energy consumption and expenditure as well as it relates to other variables such as cooking, heating and lightning. The income and energy expenditure line peak at average with values of 59.46% and 43.24% respectively, while energy consumption line 'tables out' between average and high both having equal values of 35.14%. The implication of this is that majority of the UK respondents consider themselves to have an average energy expenditure while having an average level of income irrespective of their energy consumption. This further implies that energy is just affordable irrespective of its usage. However the energy consumption of specific variables such as cooking, heating, lighting and transportation do not follow the same trend as the total energy consumption line and peak at average with values of 54.05%, 43.24%, 62.16% and 43.24% respectively. The values of this specific variables show that majority of individuals consume more energy on lighting, followed by cooking while energy used for heating and transport have the same value.

Fig. 2 describes where the respondents from the UK perceive most of their energy comes from when given several options and given the opportunity to rank these options. The results show that oil and gas is considered the option most used to generate energy followed by coal power, nuclear power, wind power, hydroelectric power, biomass and solar power in that specific order with the addition of private generator being the least perceived to generate energy in the UK.

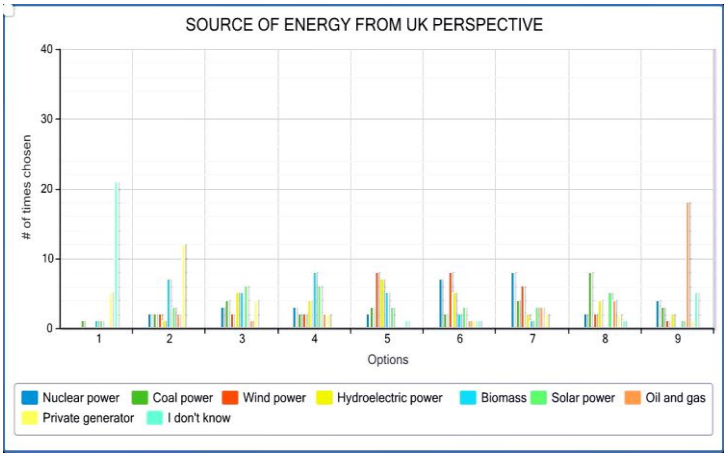

Figure 2: Source of energy from the UK perspective

This result may be a consequence of the fact that the UK respondents acknowledge the role of transportation in their daily lives because the price of petrol or gas directly affects their way of living.

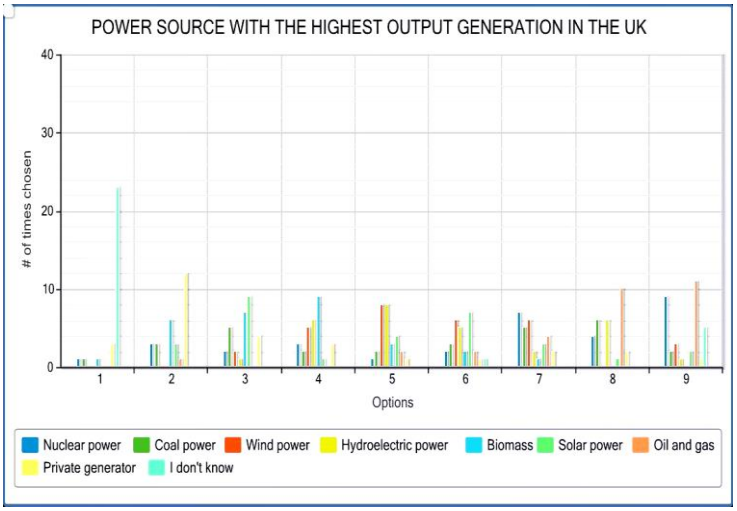

Figure 3: Perception on the power source with the highest output for generation in the UK

Fig. 3 describes the power source with the highest output generation perceived by the UK research participants. The results show that the respondents perceive that oil and gas generates more energy than other power sources with a value of 36.67% for a rank of 9 and 33.33% for a rank of 8. Oil and gas is followed by nuclear power having a value of 28.12% for a rank of 9 and 21.88% for a rank of 7, while wind power follows after with a ranking of 5 and 6 having the

values of 26.67% and 23.33% respectively. Hydroelectric power is perceived to generate more energy just after wind with a ranking of 5 and having a value of 27.59%. Biomass, solar power and private generator come after in that order with ranks of 4, 3 and 2 having values of 31.03%, 30% and 41.38% respectively.

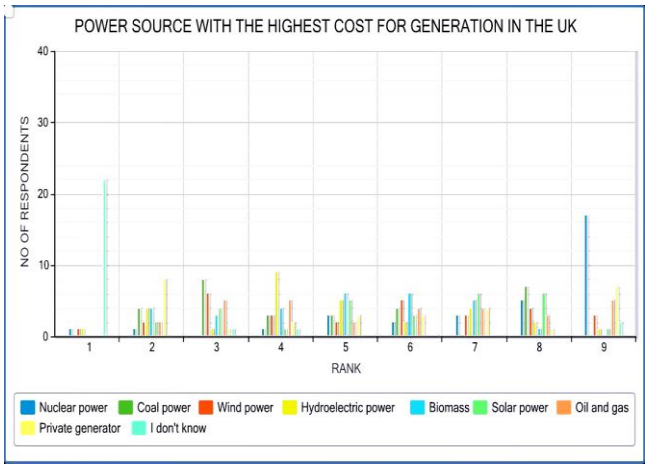

Figure 4: Perception on the power source with the highest cost for generation in the UK

Fig. 4 describes the source of power that the UK respondents perceive to have the highest cost for generation. The results show that Nuclear power is perceived to have the highest cost for the generation of energy followed by coal power, solar power, biomass, hydroelectricity and private generator in that order with a value of 24.14% for a rank of 8, 21.43% for a rank of 7, 20.69% for a rank 6, 31.03% for a rank of 4 and 27.59% for a rank of 2 respectively. However coal power had the highest value of for the ranks of 8 and 3, this could be explained by the inclusion of carbon capture and storage or other carbon emissions reduction technologies. Coal power without carbon emissions technologies would be much cheaper than coal power with such technologies.

Fig. 5 describes the power source the UK respondents consider to be most environmentally friendly and the results show that solar power is considered to be the most environmental friendly with a value of 33.33% and 39.39% for a rank of 9 and 8 respectively. Wind power follows after solar with values of 32.35% and 29.41 for a rank of 9 and 8 respectively, while hydroelectricity comes after with a value of 35.48% for a rank of 7.

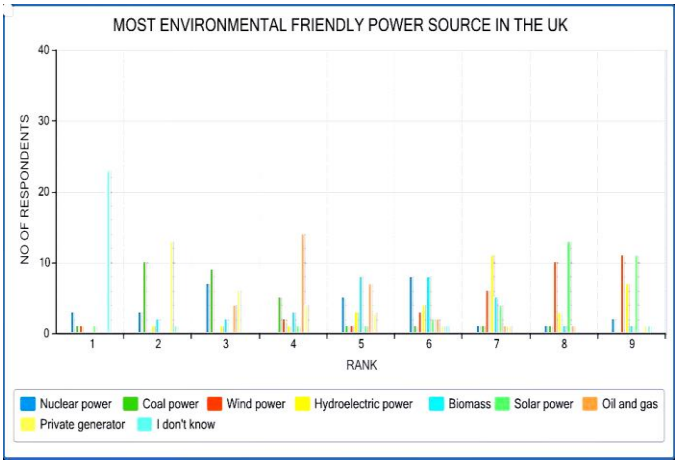

Figure 5: Perception on the most environmental friendly power source in the UK

Fig. 5 describes the power source the UK respondents consider to be most environmentally friendly and the results show that solar power is considered to be the most environmental friendly with a value of 33.33% and 39.39% for a rank of 9 and 8 respectively. Wind power follows after solar with values of 32.35% and 29.41 for a rank of 9 and 8 respectively, while hydroelectricity comes after with a value of 35.48% for a rank of 7. Biomass and nuclear power both have a rank of 6 having the same value of 26.67% while oil and gas follows after with a value of 48.28% for a rank of 4. Coal power and private generator have a rank of 3 and 2 with values of 31.03% and 44.83% respectively.

Fig. 6 describes the power source the UK respondents perceive to be the best suited for the UK and the results show that, nuclear is perceived to be the best suited for the UK having a rank of 9 with a value of 27.59% followed by wind having a value of 22.58% for a rank of 8, while biomass has a rank of 7 for a value of 25%. Hydroelectric power comes right after biomass with a value of 23.33% for a rank of 6 followed by oil and gas having the same value of 23.33% for the rank of both 5 and 4. Coal power has a value of 35.71% and has a rank of 3 while private generator was the least ranked with a value of 53.57%.

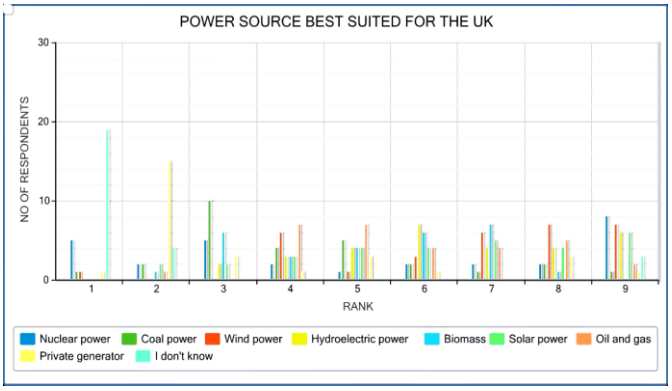

Figure 6: Perception on the power source best suited for the UK

The survey results also show that majority of the UK respondents agree that there is an energy crisis and this may be due to the volatility of oil and gas prices which they perceive to be the source where most of their energy is generated. On the other hand majority strongly agree that there is an environmental and climate change crisis, this may be influenced by the recent increase in the occurrence of floods and heat waves in the UK. This result may also be influenced by information being passed by the media sources such as Newspapers, TV, radio and the internet on such issues, given the fact that most respondents agree to obtain most of their information from these sources and averagely accept what information is being presented. Majority of the UK respondents are of the opinion that their government is very responsive to the issues of energy, climate change and the environment, however a significant percentage also disagree that their government is responsive. This result could be as a result of discrepancies in communication between the government and the public on what it is doing concerning these issues and/or it could be as a result of the high expectations of certain individuals in the society. Although the UK government's responsiveness to energy and environmental issues favours the majority, the majority rate their individual responsiveness to such issues as average even though they participate significantly in sustainable development activities such as recycling and energy management. The results from the survey further show that majority of the UK respondents are more responsive to sustainable development activities such as energy management and the use of public transport when influenced by cost and less responsive when influenced by the environment. However in the case of the usage of private vehicles the majority of UK respondents appear to be in disfavour of this medium of transportation and this may be due to the increase in the price of oil and the negative reviews private vehicles have received as regards the issue of climate change. The results further show that UK respondents who participate in walking do not do so because it is convenient or cheap but embark on such activity because they are averagely motivated to save the environment. Majority of respondents in the UK have a positive inclination towards renewable technology as majority agree that installing renewable technology in their homes could help them save cost and the environment. Majority of respondents in the UK agree to applying energy management techniques when using their home appliances even though majority of them may not necessarily purchase energy saving appliances. The results show that a large percentage of UK respondents have knowledge on sustainable development and agree that it is an important subject matter. Finally majority of the UK respondents strongly dis-agreed that energy security and energy management were irrelevant.

Perception of Sustainable Development in Nigeria

The distribution between male and female respondent in Nigeria where not even with majority of the respondents being male having the value of 75% and females the value of 25%. 39.6% fell into the age group of 26-35 while others fell into the following age groups of 15-25, 36-50 and above 50 with values of 27.1%, 29.2% and 4.2% respectively. The staff category recorded highest with a value of 51% under the occupation section followed by student, business owner and parent with values of 30.6%, 16.3% and 2% respectively. Majority of Nigerian respondents live in rented accommodation having a value of 45.8% followed by those who live with family and friends having a value of 35.4%, while the value of those who own their personal accommodation had a value of 16.7%.

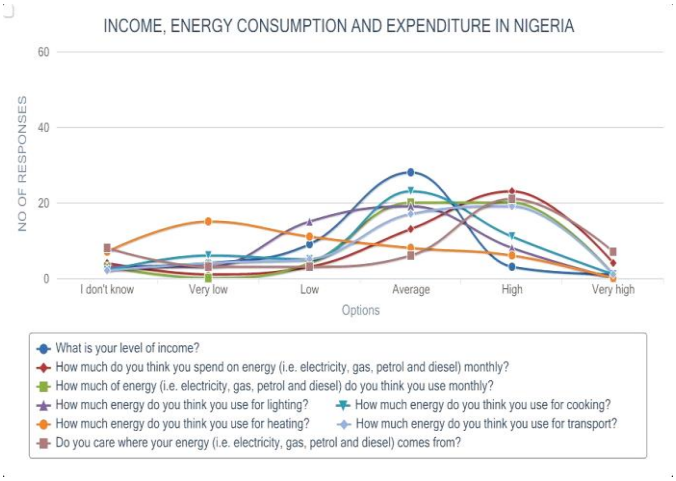

Figure 7: Income, energy consumption and expenditure in Nigeria

Fig. 7 represents the income, energy consumption and expenditure of Nigerian respondents and shows that 58.33% which is the majority consider themselves to receive average incomes, therefore the income curve peaks at average. On the other hand the energy expenditure line peaks at high with a majority value of 41.67%. The implication of this is that majority of the Nigerian respondents perceive themselves to be spending more on energy than their income, which describes a situation opposite of affordability. The energy consumption line 'tables out' between options of average and high, having the same value of 41.67%. Energy use for lighting and cooking peak at average with values of 39.58% and 47.92% respectively, however this is not the case for heating and transportation. Energy use for heating peaks at very low with a value of 31.91% and this may be because of the weather climate of Nigeria which is usually hot and therefore requires less heat. Energy use for transportation peaks at high with a value of 39.58% and this may be because the most used mode of transportation is road transport and thus requires a lot of energy from oil and gas.

Fig. 8 describes where the Nigerian respondents consider their major source of energy comes from and the results show that hydroelectricity has the highest rank of 9 and an alternative rank of 7 with values of 38.3% and 17.02% respectively. Hydro electricity is followed by oil and gas with a rank of 8 and a value of 36.84% and after solar power with a rank of 6 and 5 having the same values of 21.21%.

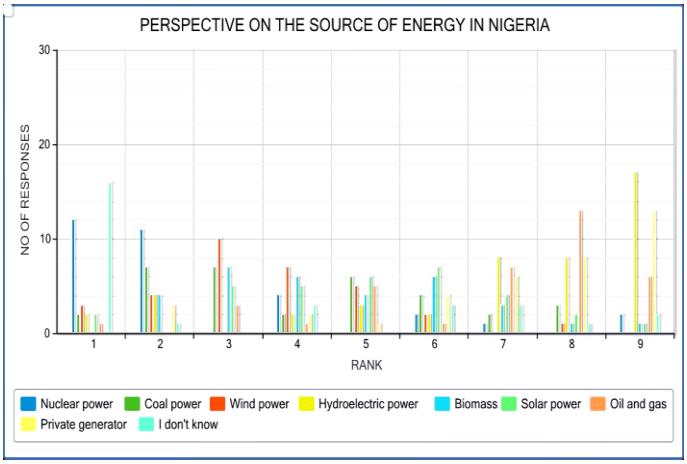

Figure 8: Perspective on the source of energy in Nigeria

Wind has a rank of 4 and 3 with values of 24.24% and 30.03% respectively while nuclear has a rank of 2 with a value of 33.33%. Other sources such as biomass and coal power had insignificant values per rank; however private generator appeared to be a contender with hydroelectricity for the rank of 9 with a value of 34.21%. This is an indication of the inadequate level of energy generation by the energy industry in Nigeria this is because several individuals rely heavily on private generators. The results on the perspective of the Nigerian respondents on the power source with the highest output generation (Fig . 9) shows that Nuclear power is considered to have the highest output generation with a rank of 9 and a value of 41.67%. This is followed by oil and gas with a rank of 8 (28.57%) then hydroelectricity with a rank of 7 (20.51%) and after solar power with a rank of 6 and 4 with values of 21.05% and 18.42% respectively.

Other sources such as wind power, coal power and private generation have the ranks 5 (24.24%), 3 (20.59%) and 2 (29.41%) respectively. Biomass had insignificant values this may be due to the insufficient knowledge on the technology in Nigeria.

Fig. 10 illustrates the power source with the highest cost for energy generation from the perspective of the Nigerian research participants and it shows that Nuclear is perceived to have the highest cost for

generation with a rank of 9 (55.56%) followed by oil and gas with a rank of 8 (38.24%).

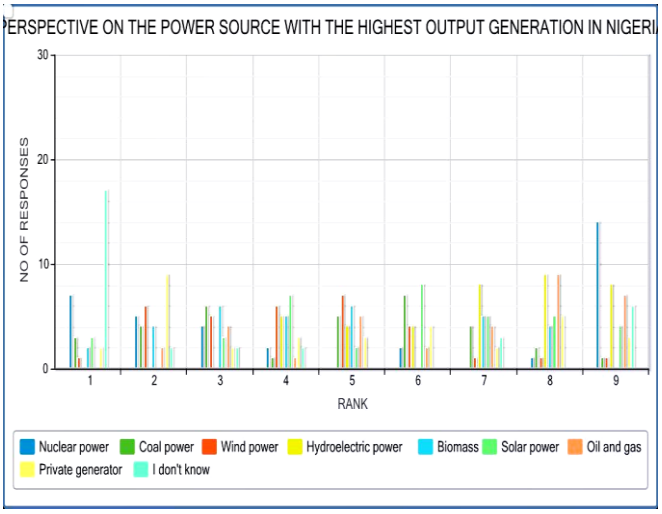

Figure 9: Perspective on the power source with the highest output generation in Nigeria

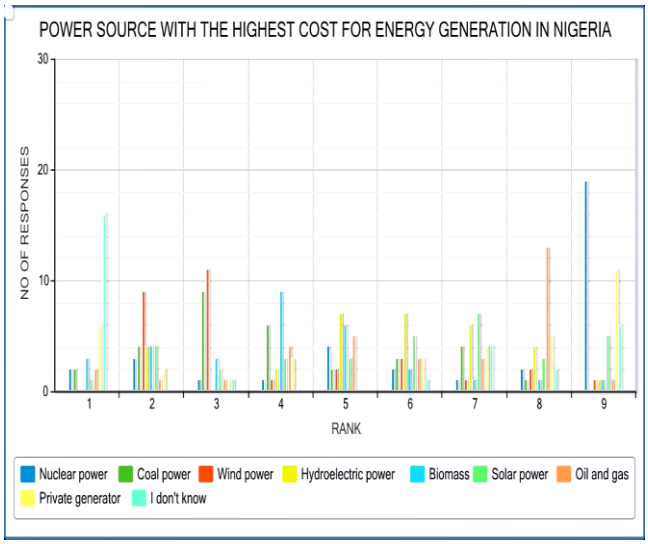

Figure 10: Perspective on the power source with the highest cost for generation in Nigeria

Other power sources and their ranks are as follows, solar power has a rank of 7 (20.59%), hydroelectricity is ranked at 6 (21.88), biomass has a rank of 5 and 4 with values of 22.58% and 29.03% respectively and wind power with a rank of 3 (35.48%) and 2 (32.26%). These values may have been influenced by the exposure of the Nigerian respondents to information from media sources on such issues especially because majority believes the information obtained from these sources.

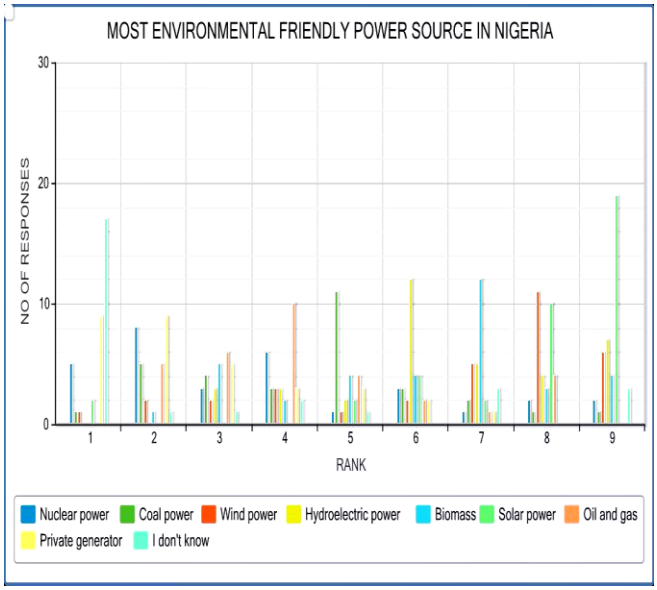

Figure 11: Perception on the most environmental friendly power source in Nigeria

The most environmental friendly power source from the Nigerian respondent's perspective (Fig. 11) shows that Solar power is considered to be the most environmental friendly power source with a rank of 9 (50%) followed by wind power having a rank of 8 (35.29%) and then biomass 7 (33.33%). Other power sources such as hydroelectricity, coal and private generators have the following ranks of 6 (32.43), 5 (34.28%) and 2 (27.27%) respectively. Oil and gas has a rank of 4 (30.3%) and an alternate rank of 3 (18.18%) while Nuclear power had no significant value to obtain a rank. The insignificant value of nuclear power may have been influenced by the knowledge of the probability of an environmental disaster in the event of a nuclear meltdown.

Fig 12 describes power source best suited for Nigeria from the perspective of the Nigerian respondents and the results show that Solar power is considered the most suited with a rank of 9 (53.66%) followed by hydroelectricity 8 (24.32%) and after biomass with a rank of 7 (24.24) and an alternative rank of 4 (21.21%). Wind power has a rank of 6 (21.21%) and an alternative rank of 5 (21.21%) while coal power and private generator have a rank of 3 (23.53%) and 2 (26.47%) respectively.

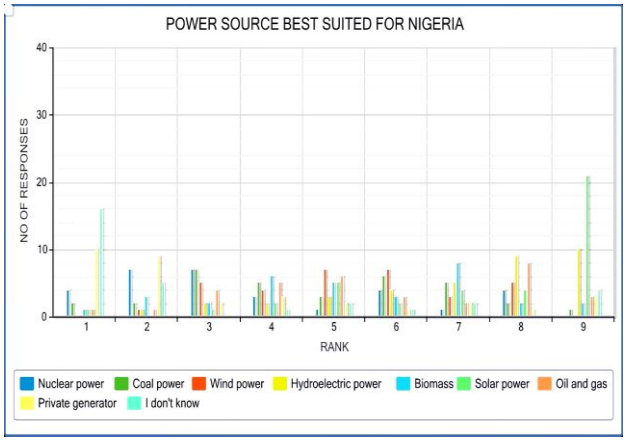

Figure 12: Perception on the power source best suited for Nigeria

This result may have been influenced by the knowledge of the fact that Nigeria experiences a lot of sunshine and a lot of heat in which a lot of Nigerians believe can be harnessed to generate electricity. In addition there is a lot of waste in Nigeria as well as land for energy crops in which Nigerians may consider useful to generate energy in the form of Biomass.

Nigerian respondents strongly agree that there is an energy crisis, and this could be as a result of the volatility in oil and gas prices, since they perceive oil and gas to be one of their major sources of energy. These results may also be a consequence of the frequent power disruptions and the constant fuel shortages experienced in Nigeria. The respondents in Nigeria also agree and strongly agree that there is an environmental and climate change crisis probably due to the frequent occurrences of flood and drought in major parts of the country, as well as the environmental degradation being experienced in the oil producing regions of Nigeria, such as the Niger Delta region. The environmental degradation in this region (i.e. Niger Delta) is so bad that it has encouraged the occurrence of militancy activities that has claimed the lives of several individuals local and foreign. These perceptions may have been influenced or amplified by the information obtained from media sources, as majority of Nigerian respondents agree to obtain most of their information from TV, radio, newspaper and the internet and have a significant acceptance level for such information. Nigerian respondents strongly disagree to their government's responsiveness to the energy and environmental crisis, and this may be as a result of the inadequate energy infrastructures available and the high level of corruption experienced in the country. In the same vein majority of the respondents disagree to individually responding to the energy, environmental and climate change crisis and this could be as a result of the lack of knowledge on what to do as regards issues relating to sustainability development. The inclination towards energy management is significant even though the respondents agree and strongly agree that they are influenced majorly by cost rather than the environment. Other elements of sustainable development such as recycling appear not to be an important activity amongst Nigerian respondents as the majority disagree of their participation in this activity. The results further show that the Nigerian respondents have a lesser inclination towards public transport as majority strongly disagree to using public transport even if it is cheap or beneficial to the environment. This may be evidence of the fact that there are limited infrastructures for public transportation, while the available infrastructure is unreliable, inconvenient and very unsafe. On the other hand the respondents showed a greater inclination towards the use of private vehicles especially when influenced by cost. These result are contrary to those obtained for the inclination towards walking and biking which is observed as being very low because majority disagree and strongly disagree to participating in such activities irrespective of cost, convenience and the environment. This result is an indication that the perceived cost of owning a vehicle is much lower than using public transport, as well as the fact that using a private vehicle in Nigeria is a status symbol and would always be picked over walking and biking. In addition the result may represent the absence of appropriate infrastructure to encourage such activities such as walking and biking and emphasizes the reliability and convenience of private vehicles to the Nigerian public. The inclination towards the use of renewable energy technology is significant as majority of the respondents agree and strongly agree that renewable energy technology would help them save cost and protect the environment. Furthermore

the results show that the respondents use home appliances efficiently mainly to reduce their energy bills, however majority disagree to purchasing energy saving appliances which may be as a result of little knowledge on sustainable development methods. Finally the respondents agree and strongly agree that sustainable development is an important issue and strongly disagree that energy security and management are irrelevant in society.

Limitation of the Study

The sample size used in the study is small and may be insufficient in analyzing accurately the perception of sustainable development in both developed and underdeveloped countries. It may have proven useful to obtain information about developing countries, however this study lacks this element, therefore giving the study a less realistic approach to a global issue. In addition the United Kingdom and Nigeria may not be true representation of developed and underdeveloped countries, therefore the existence of bias. The study also relied on survey which was collected over the internet. The implication of this is that the respondents may not be a true representation of the countries viewed in this study. There is therefore a bias, as the study does not account for individuals without access to internet, which is likely uneducated or lack such infrastructure. These limitations however do not underpin the integrity of the study, as it attempts to provide a first look at how individuals on different economic spectrums might perceive the concept of sustainable development. There is therefore a ground to build upon this research.

CONCLUSIONS

The results of the study show that there are similarities and differences in the perception of sustainable development in both countries. One major similarity is that respondents were knowledgeable on sustainable development; however the major difference lies in the actions they take towards the concept. The United Kingdom appear to be more inclined to participating in sustainable development activities for a variety of reasons such as cost, the environment, access to information. On the other hand Nigeria appeared to be less inclined to participating in sustainable development activities, also for a variety of reasons. Having insight to the perceptions of individuals in both countries on the concept of sustainable development, suggests that there is a significant gap for improvements in both societies.

CONFLICT OF INTEREST: None

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