

# Development of Renewable Energy Technologies in Federal Republic of Nigeria Current Status Problem and Prospects

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## **Abstract:**

The present manuscript deals with the barriers faced by the people of Nigeria in the adoption of renewable energy. Nigeria is the most populous country of Western Africa which have a large capacity of generation of renewable energy technology due to the favorable geographical location. The survey is focused on the current problems of renewable energy technology faced in Nigeria, obstacles and future problem. The views of the responders have taken through the form of a questionnaire and the questions are based on renewable energy, its usage and environment awareness between the citizen of the country.

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## **I. INTRODUCTION**

In today's scenario, the world is facing serious concerns with rising in global warming due to the effect of greenhouse gases like Hydrofluorocarbons (HFCs), Sulphur Hexafluoride, Carbon dioxide, Methane, and Nitrous oxide [1]. The use of conventional sources like coal, fossil fuels are used mainly in electricity generation on a huge scale for industries, multinational companies, to the houses, etc [2]. To lower the impact of global warming which is increasing the earth's temperature every year we have to look for an alternative source of energy which may prove as a cleaner and green source of energy [3].

The role of renewable energy came into existence after the rise in global warming and increment of greenhouse gases in the earth's atmosphere [4]. Renewable energy resources are inexhaustible and can be replenished with time. Renewable energy resources are often termed as a cleaner source or non- conventional source of

energy. It can be renewed and regenerated with time [5]. Some of the renewable energy resources are solar energy, wind energy, biomass, geothermal and hydroelectric energy; these are the sources which never deplete like the conventional sources [6].

This paper deals with the current status, problems and future prospects related to the renewable energy resources and technology in the Federal Republic of Nigeria. Nigeria is a country in the western region of Africa, has an area of 923,763 km<sup>2</sup>. According to the World Bank in 2017, the population of Nigeria is 19.09 crores. Nigeria consists of 36 states and one federal territory where the capital of Nigeria, Abuja is situated. According to report published by The Institute for Health Metrics and Evaluation (IHME) over 114,000 deaths happened in Nigeria due to air pollution and also according to a report, Nigeria ranks 10th in terms of pollution which is a serious concern for the Nigerian communities. Nigeria is lagging behind in terms of usage or adoption of renewable energy technology because of poor literacy rate and lack of

awareness among the people. According to Health Effects Institute (HEI) and The Institute for Health Metrics and Evaluation (IHME) in 2017, over 64,000 numbers of people died in Nigeria due to household pollution which involves the burning of convention resource of energy like charcoal and also due to leaky stoves. Some report showed that the situation of Nigeria is the worst country in Africa in terms of polluted country and stand second in the African continent.

This survey comprises of 100 respondents from the different geographical locations of Nigeria. Present environmental conditions show that Nigeria needs a revolution to overcome from the drastic changes in the environment caused by the usage of conventional resources of energy and the people of Nigeria should look forward to moving towards renewable energy resources or non-conventional source of energy. Generally, people of Nigeria lack awareness and illiteracy is the major cause behind the present condition of Nigeria. The major section of Nigeria has no idea about the schemes launched by their government and therefore they do not look forward to switching towards renewable energy.

## II. EMPIRICAL DESIGN

The survey also gathers the information about the energy practice of the citizens of Nigeria. 100 respondent data has been collected. The survey also indicates that there is very less awareness about the renewable energy technology in the country. Nigeria is a 10th largest oil producing country. The renewable energy technologies can generate more employment with reference to the oil industry. The geographical location of Nigeria is just above the equator so it is clear that sun is shining throughout the year except some days. The northern Nigeria has result for hot weather which may be a favourable for the generation of solar energy while the southern part have a around 1,000 kilometre active coastline for the generation of wild energy.

## III. DISCUSSION OF FINDINGS

The survey consists of 100 respondents of Nigeria. The respondents belong to northern and southern parts of Nigeria respectively. From fig. 1 it is known that 80% of respondents belong to north Nigerian region and 12% of respondents to the southern part of Nigeria.

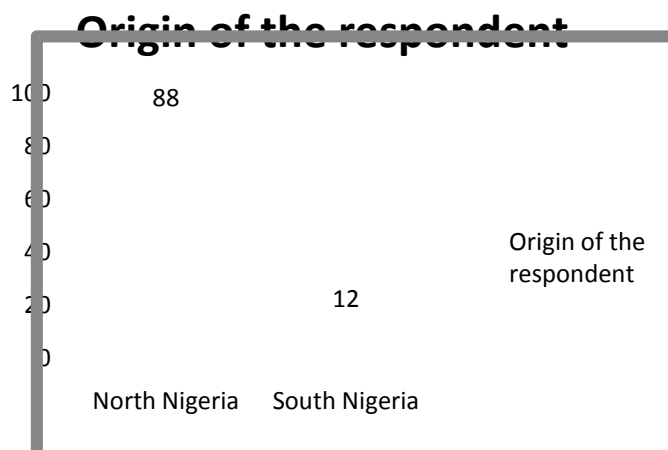


Fig. 1: Origin of the respondent

Next part of survey describes the place of origin of respondents. From Fig. 2 it is known that 50% of the respondents belong to metropolitan city (Capital of any state), 42% of the responders belong to any town or district area and rest 8% of it belong to village area of Nigeria. While analyzing Fig. 2, we get to know that the majority of the responders belong to metropolitan city so, it helps us to know the basic idea about the future plans and views of government about the implementation of renewable energy technologies and further

plantation of renewable energy technology in town and village parts of Nigeria.

In Fig. 3, about 24% of are working professionals, majority of around 72% of the respondents are University students pursuing their graduation and post-graduation and 4% of the respondents are form polytechnic or any higher institute

From Fig. 4 the pie chart shows that majority around 54% of the respondents falls to the category of 20-24 year of age, 20% of the respondents falls into the category of less than 20 years of age, 16% of the responders falls into the category of more

than 30 years of age and only 10% of the respondents are in between 25-30 years of age.

In Fig. 5 majority of the respondents around 60% reside in 3BHK flat or house, 24% of the respondents reside in 2BHK house or flat, 14% resides in 1BHK flat or house and remaining 2% of them are settled in hut.

The next part of survey as in Fig. 6 states that respondents views in favor of government initiatives to promote renewable energy

technologies, majority of the responders 86% of them are with government policies for renewable energy technologies, 6% of them are against it, while 8% of them are still unsure whether to support it or not. This data shows that despite the efforts from the government, people lack education as they cannot decide what is right for their own sake. Still people lack awareness about the policies or technologies that are available to them but they could not decide what is beneficial for them.

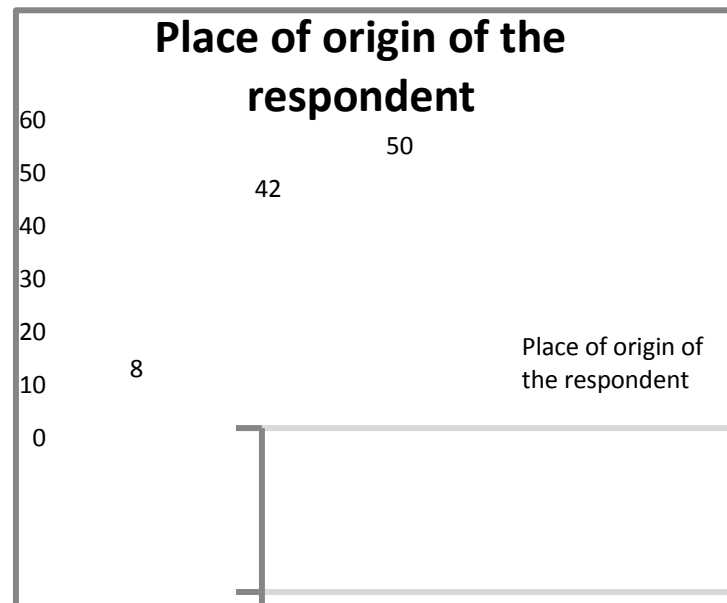


Fig. 2: Place of origin of the respondent

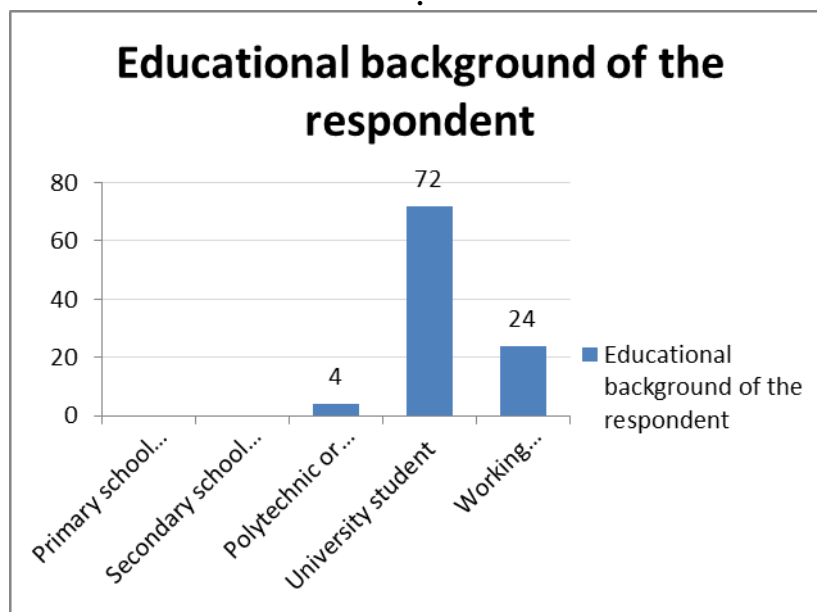


Fig. 3: Educational background of the respondent

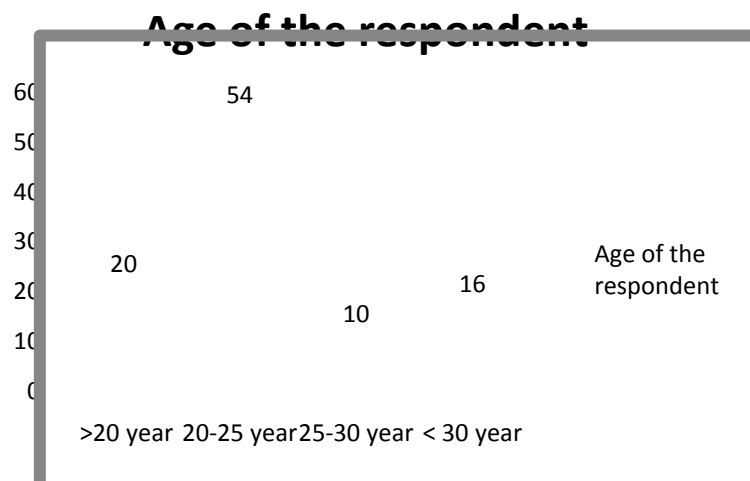


Fig. 4: Age of the respondent

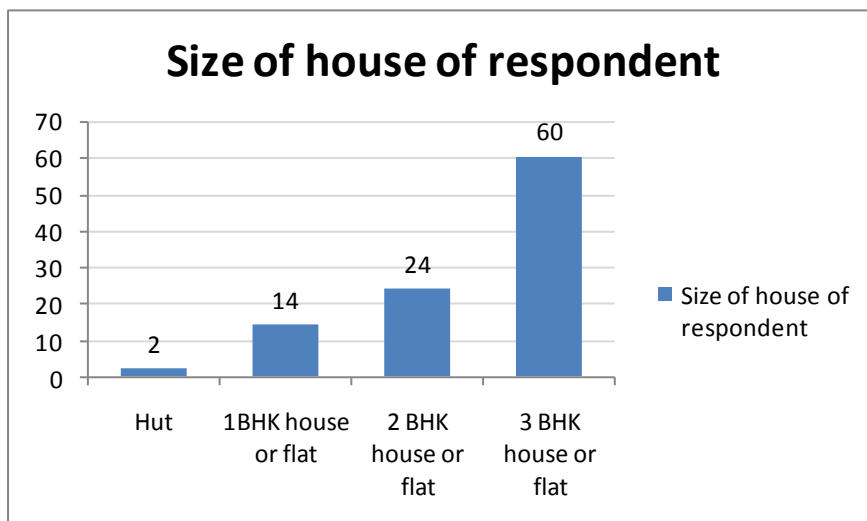
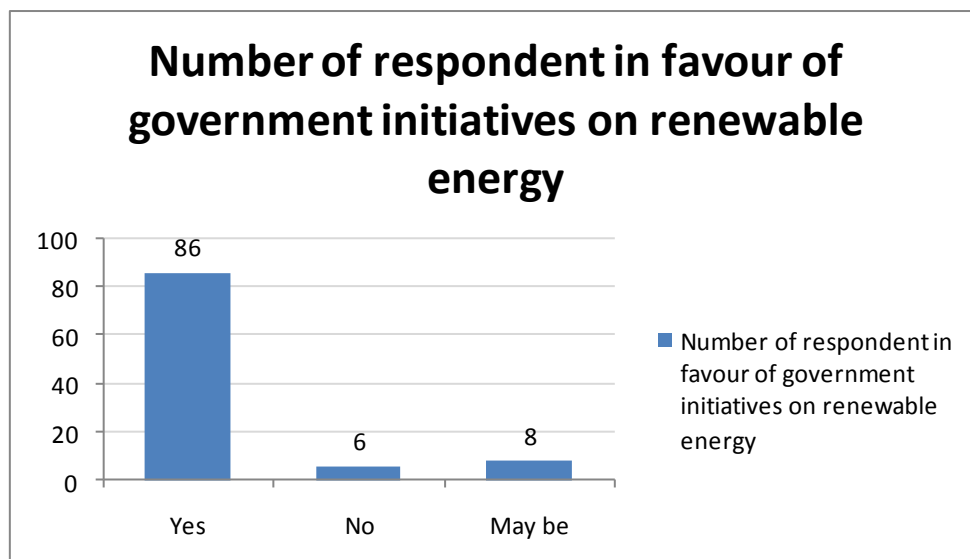
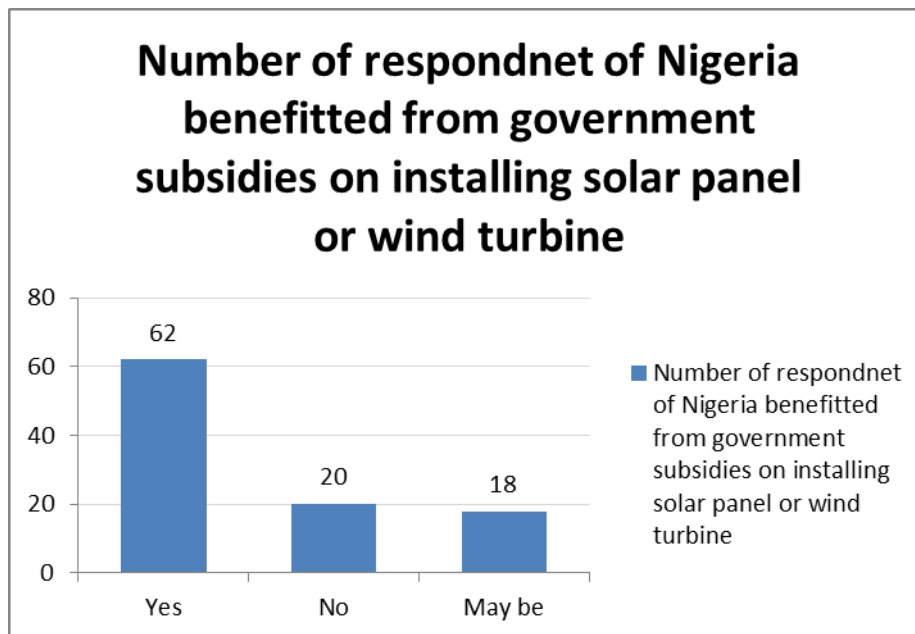


Fig. 5: Size of house of respondent



**Fig. 6: Number of respondent in favour of government initiatives on renewable energy**

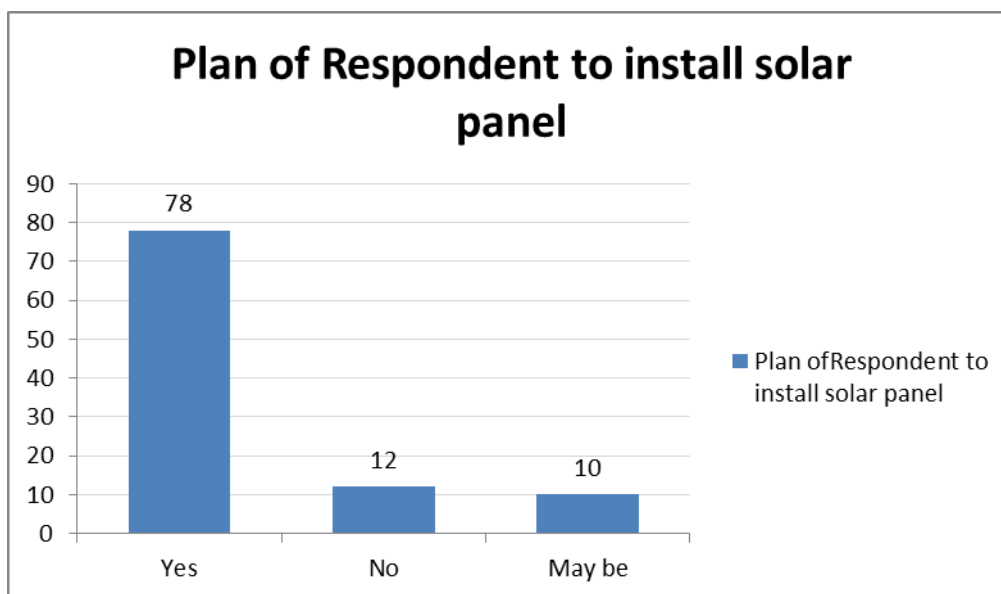
As we can see from Fig. 7 majority of responders about 62% of them are benefitted from government subsidies, 20% of them are still not while 18% of them are unaware about the subsidies provided from the government.



**Fig. 7 : Respondent benefitted from government subsidies for installing solar panel or wind turbine**

In the next part of this survey when the responders were ask whether they have any plans in future to install solar panels or not, as depicted from Fig. 8 major section around 78% of the responders were in favour to plant solar panel at their houses, 12%

still do not want to plant solar panel, this is may be due to lack of education about renewable energy technology or less promotion by the governments among their people while 10% are unsure whether to install it or not.



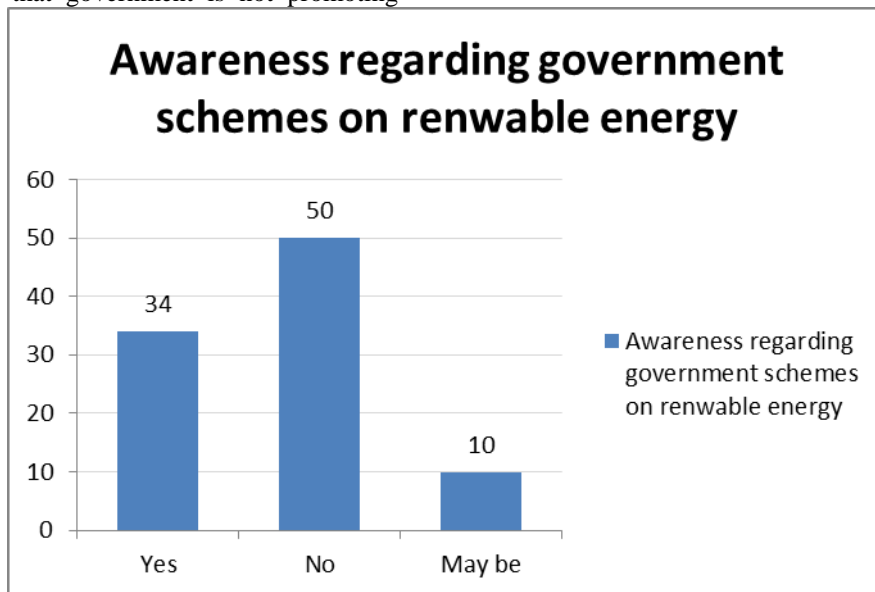
**Fig. 8: Plan of respondent to install solar panel**

As we can see from Fig. 9 when respondents were asked whether they are aware of any government

scheme or not 56% of them were unaware about the government schemes, 10% were in doubt while

34% of them only are aware about the government schemes. This data show that majority of them lack about the basic policies of government and this clearly shows that government is not promoting

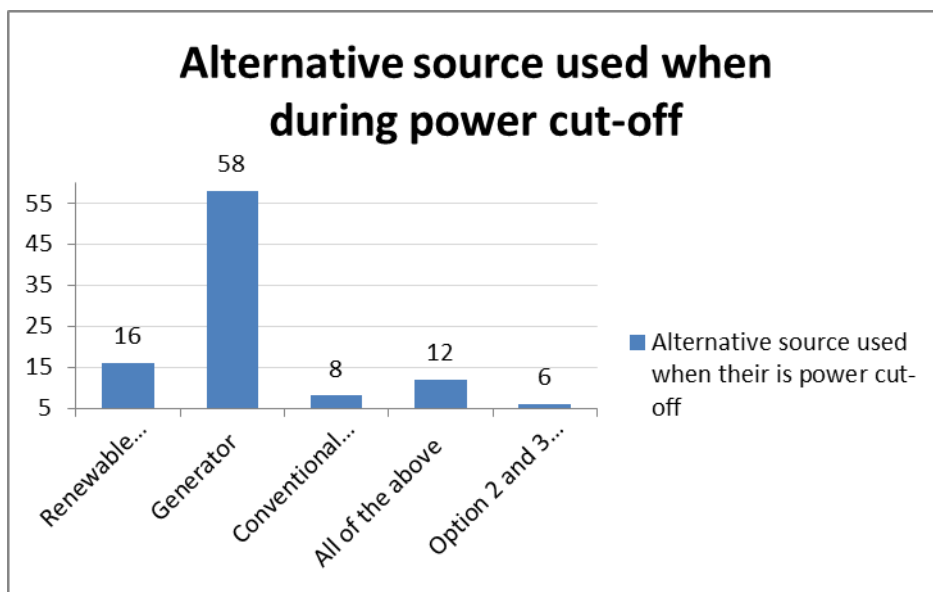
their schemes because of that it is not reaching to the common people so that they could avail the benefits from the schemes.



**Fig. 9: Awareness of respondents regarding government schemes on renewable energy**

After that respondent were asked about the sources used when the power is cut-off, it is depicted from Fig. 10 that 58% of them are using generator as an alternative source, 16% of them are using renewable energy source, 12% of them are reliable on all of the options stated in figure, 8% of them are dependent on conventional method and 6% of the responders are reliable on renewable energy

source and generator. The statistics showed that there is a huge lack of awareness and lack of education regarding renewable energy technology. Most of the respondents are dependent on source of energy as an alternative source. People need to be made aware about the benefits of using renewable energy technology and how it can prove to be effective on their economy.



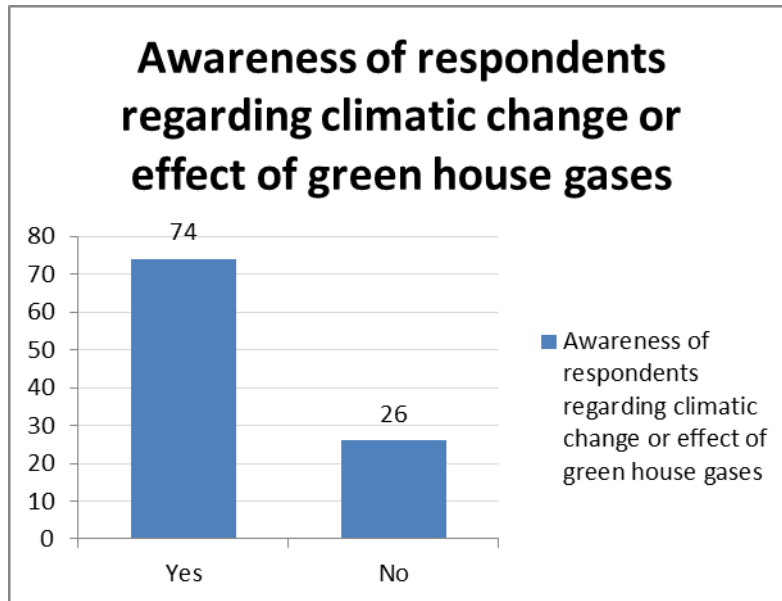
**Fig. 10 Alternative source usage by respondent during power cut-off**

As Fig. 11 states that when respondent were asked whether they are aware about the environmental

changes or effect of green house gases occurring due to use of conventional sources it is good to

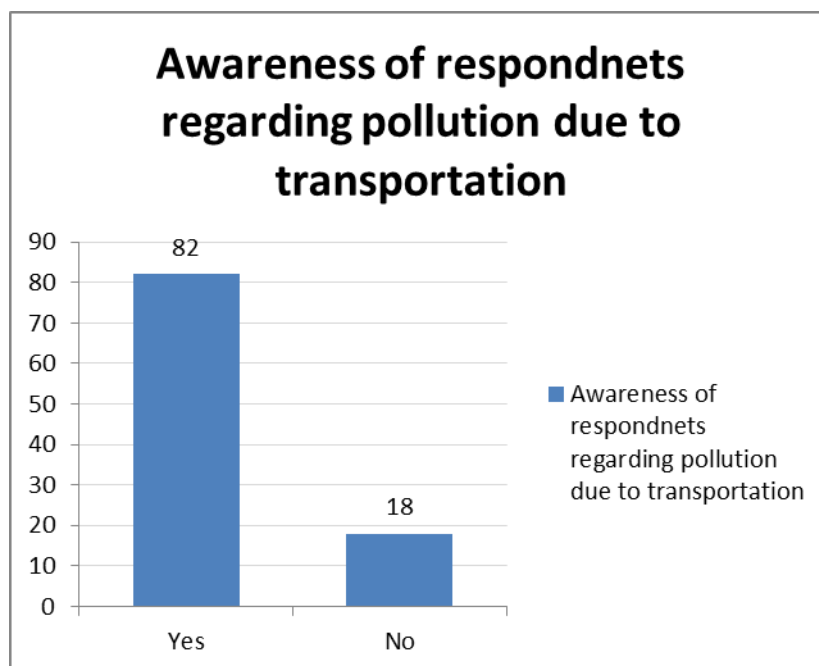
know that the 74% of the respondent are aware of the environmental changes and also about the effect

of green house gas while 26% of them are not aware.



**Fig. 11: Awareness of respondents regarding climate change or effect of green house gas**

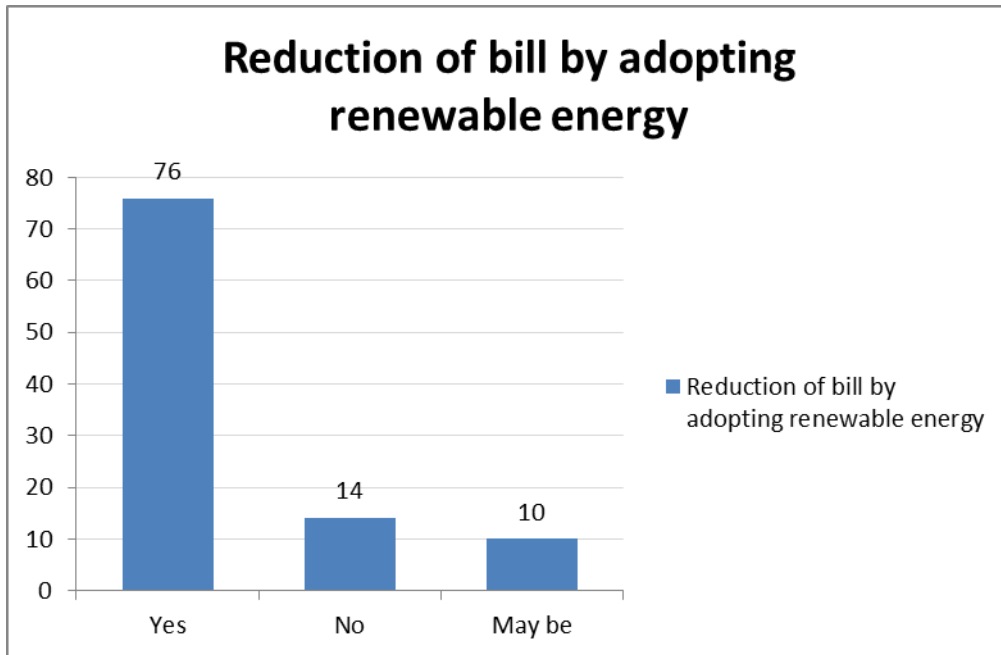
In Fig. 12 82% of the respondents are aware about the pollution caused due to transportation while 18% of the respondents do not have any idea regarding vehicular pollution.



**Fig. 12: Awareness of respondents regarding pollution due to transportation**

In Fig .13 when respondents are asked that whether they think that by adopting renewable energy (solar and wind energy) they can reduce their electricity bill most of them around 76% of the respondents

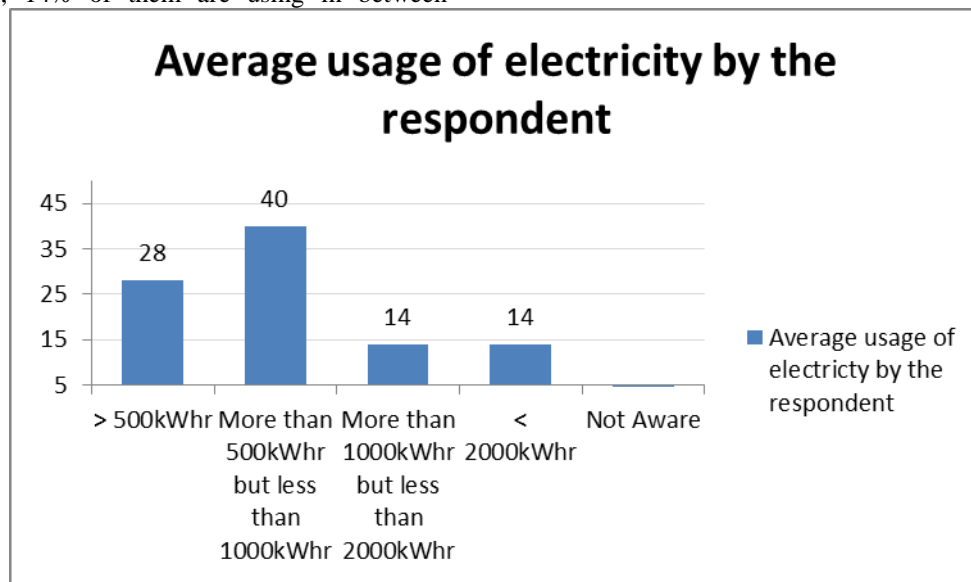
think that it can reduce their electricity bill, 14% of them do not think so while 10% of them are not aware that by adopting renewable energy how it can affect their electricity bill.



**Fig. 13 Reduction of bill of respondents by adopting renewable energy**

The next section of the survey deals with the average electricity usage by the respondents. From fig. 14 we get to know that the 40% of the respondents are using electricity in between 500KWhr-1000KWhr, 28% are using less than 500KWhr, 14% of them are using in between

1000KWhr-2000KWhr, 14% of them are using more than 2000KWhr and 4% of them are do not know how much electricity they are consuming at an average.

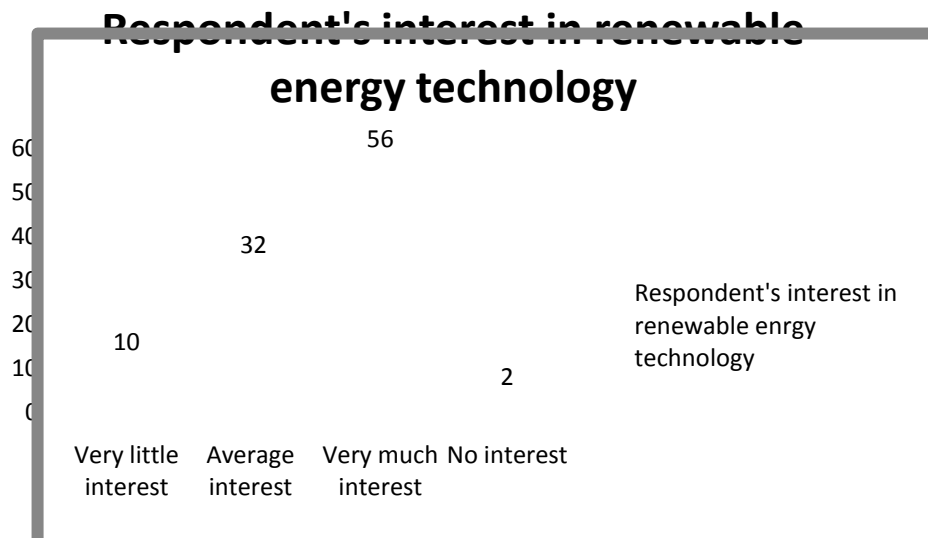


**Fig. 14: Average usage of electricity by the respondent**

In the last section of the survey respondents were asked about their level of interest in renewable energy technology 56% of them are very much interested, 32% have average interest, 10% of them

have a very little interest and 2% of them have no interest regarding renewable energy technology as stated in Fig. 15





**Fig. 15: Respondent's interest in renewable energy technology**

#### IV. CONCLUSION

As science and technology is expanding at an exponential rate to make the world a better place, we should look forward to adopt the technology or resources that can help us to change the world in a positive way while leaving behind the traditional methods. Renewable energy is the ultimate example of a cleaner source of energy, it has already been proved and accepted all over the globe and its resources are also available for an infinite time which means they can be replenished with time. On the contrary, the non-renewable resources are finite and will get finished with time also, it causes environmental hazard over large scale due to which it causes multiple disease and deaths to humankind of all over the place.

As Nigeria is located north of the equator it has a tropical climate, due to the influence of Sahara desert, the northern part has semi-arid type of climate and southern most part receives more rainfall as compared to the northern part and also due to its coastline which is 853 km in length. As depicted from the geographic location of Nigeria, we can make use of solar energy in northern part whereas the southern part of Nigeria can utilize its coastline by establishing the plant of the windmill. The harnessing of power from natural resources can be proved as a boon to the farmers for irrigation, for household purposes and for small and big institutions which directly increase the economy of their country and bring prosperity. The Government of Nigeria should advertise their schemes on the front page of a daily newspaper and should issue the postal stamps and postal cards so that their policy could reach to every individual of their country.

The government must ensure and strictly apply the rules and regulation in the government and as well as private institution that they should include a compulsory subject on renewable energy education at school level as well as undergraduate level. The advertisement through non-government organization or by any other means should be done so as to ensure that every individual know the importance of renewable energy technology in both town and rural areas of the country.

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